300549

ENTERED
Office of Proceedings
April 20, 2020
Part of
Public Record

BEFORE THE
SURFACE TRANSPORTATION BOARD

RAILROAD COST OF CAPITAL — 2019	)	EX PARTE NO. 558 (Sub- No. 23)

COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS AND ITS MEMBER RAILROADS

Kathryn D. Kirmayer
Timothy J. Strafford
J. Frederick Miller Jr. *(admitted in Maryland)*
Association of American Railroads
425 Third Street SW Suite 1000
Washington, DC 20024
(202) 639-2506

Counsel for the Association of American Railroads

April 20, 2020

Table of Contents

I. Introduction **2**

II. The Cost of Common Equity Capital **3**

III. The Cost of Preferred Equity Capital **7**

IV. The Cost of Debt **8**

V. The 2019 Capital Structure of the Railroad Industry and the Overall Cost of Capital **10**

Conclusion **10**

Verified Statements

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 _____

BEFORE THE
SURFACE TRANSPORTATION BOARD

RAILROAD COST OF CAPITAL — 2019	)	STB Docket No. EP 558 (Sub-No. 23)

COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS AND ITS MEMBER RAILROADS

By a decision served on February 27, 2020, the Surface Transportation Board ("STB" or "Board") instituted this proceeding to determine the railroad industry's cost of capital for the year 2019. The Board noted that this determination will enable it to make the required annual individual railroad revenue adequacy determination for 2019. 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 – 2019*, EP 558 (Sub-No. 23) (STB served Feb. 27, 2020).

The railroads, through the Association of American Railroads ("AAR"), are submitting their calculation of: (1) the railroads' 2019 cost of common equity capital; (2) the railroads' 2019 current cost of preferred equity capital; (3) the railroads' current 2019 cost of debt capital; and (4) the 2019 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 2019 cost of common equity capital is 10.67 percent.

2. The 2019 cost of preferred equity capital is 3.64 percent.

3. The 2019 cost of debt capital is 3.48 percent.

4. The capital structure of the railroad industry is 18.54 percent debt, 0.00 percent preferred equity,[1] and 81.46 percent common equity.

From these data, Mr. Gray concludes that the overall railroad industry cost of capital for 2019 is 9.34 percent.[2]

I. Introduction

The sole purpose of this proceeding is to determine the railroad industry's cost of capital for 2019. 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 the study frame; (3) the company's bonds are rated at least BBB by Standard & Poor's and Baa

---

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

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

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 (2019).[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 2018 sample.

II. The Cost of Common Equity Capital

In its February 27, 2020, order instituting this proceeding, the Board directed that the cost of capital components be calculated "using the methodology followed in Railroad Cost of Capital – 2018." *See Railroad Cost of Capital – 2019,* EP 558 (Sub-No. 23), slip op. at 2 (STB served Feb. 27, 2020). In *Railroad Cost of Capital – 2018*, 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 – 2018,* EP 558 (Sub-No. 22), slip op. at 7-11 (STB served Sept. 30, 2019) (corrected decision).[5] Mr.

---

[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).

[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

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 + (MRP x beta)

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 2018 cost of capital proceeding. *Railroad Cost of Capital – 2018,* EP 558 (Sub-No. 22), slip op. at 7. Since the 2006 cost of capital determination, the well-regarded and widely-accepted Ibbotson Equity Risk Premium has been used for the market risk premium, as found in the *Ibbotson SBBI Valuation Yearbook* published by Morningstar.[6] Though that publication was discontinued after

---

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).

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

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 2019 calculation, the same source was used (the Duff & Phelps *2019 Valuation Handbook – 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 2017 and 2018 cost of capital proceedings. Gray V.S. at 28-36.

The values determined by Mr. Gray for the elements of the CAPM methodology were 2.40 percent for the risk-free rate, 7.15 percent for the market risk premium, and 1.0941 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 2019 is 10.22 percent. Gray V.S. at 36.

Bonds, Bills, and Inflation.

[7] Duff and Phelps notes that this premium is "Calculated 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)."

B. The Morningstar/Ibbotson MSDCF Methodology

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, 2018, and stock market values were based on shares outstanding and stock prices as of the last trading day of the last full week for 2019 – January 3, 2020 (Friday). Gray V.S. at 41-46.[8]

Mr. Gray calculates the cost of common equity capital for 2019, using the STB's version of the Morningstar/Ibbotson MSDCF model, as 11.12 percent. Gray V.S. at 48.

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 10.67 percent for 2019. 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:

[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' 2015-2018 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 40.

(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 2019, one railroad in the group had preferred stock outstanding. The estimated cost of preferred equity is 3.64 percent for 2019. 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 – 2018*, EP 558 (Sub-No. 22), slip op. at 4. In its notice of intent to participate in this proceeding, the Western Coal Traffic League ("WCTL") suggests that "the railroads' opening statement should include, on the railroads' own initiative or at the Board's direction, a presentation that treats operating leases of more than a year as debt."[9] In support of this suggestion, WCTL contends that "a GAAP

[9] Letter from Robert D. Rosenberg, Attorney for WCTL, to Cynthia T. Brown, Chief, Section of Administration,

revision, ASU 2016-02, which took effect no later than reporting year 2019, directs that operating leases longer than a year be treated as balance sheet debt."[10]

WCTL's request for a change in the methodology to calculate the cost of debt is both procedurally and substantively misplaced. The Board has long understood that permitting a party like WCTL to propose methodological changes in the annual cost-of-capital calculation should not be allowed.[11] And while Generally Accepted Accounting Principles now call for operating leases longer than 12 months to be recorded on the balance sheet as liabilities, that is not synonymous with debt in the context of this proceeding. The railroads that make up the composite railroad account for such leases as other liabilities on the balance sheet – liabilities that are not appropriately included in the cost-of-debt calculation. This treatment is consistent with other items recorded on the balance sheet as liabilities, but not treated as debt, including deferred income taxes, net pension benefit obligations, net other post-retirement benefit obligations, long-term advances, casualty and other claims, and deferred compensation.

To determine the cost of debt for bonds,[12] Mr. Gray has computed the average current bond yield for 129 bonds from the sample railroads for which data were available during 2019 according to the Board's well-established methodology. Under this approach, the bond yield is based on a sample representing 99.3 percent of the book value of the bonds issued by the railroads in the sample.[13] As the Board has recognized, equipment trust certificates (ETCs) and conditional sales agreements (CSAs) are not actively traded in secondary markets. Their costs

---

Office of Proceedings, STB, at 1 (Mar. 24, 2020).

[10] *Id.*

[11] *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital*, EP 664, slip op. at 18 (STB served Jan. 17, 2008).

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

[13] Bond data were retrieved from a Bloomberg database. Gray V.S. at 8.

were therefore estimated by comparing them to the yields on Treasury securities that are actively traded.[14] 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.[15] Using the Board's established methodology, the railroads' 2019 cost of new debt is 3.48 percent. Gray V.S. at 23-24.

V. The 2019 Capital Structure of the Railroad Industry and the Overall Cost of Capital

Pursuant to the Board's February 27, 2020 decision, the market values of debt, preferred equity, and common equity were compiled to compute the 2019 capital structure of the railroad industry. The railroads' market value capital structure on a market value basis is 18.54 percent debt, 81.46 percent common equity capital, and 0.00 percent preferred equity capital. Gray V.S. at 54. Based upon this capital structure, the overall 2019 cost of capital is 9.34 percent. Gray V.S. at 55.

Conclusion

The Board should determine that the railroads' cost of capital for 2019 is 9.34 percent.

Respectfully submitted,

Kathryn D. Kirmayer
Timothy J. Strafford
J. Frederick Miller Jr. *(admitted in Maryland)*
Association of American Railroads
425 Third Street, S.W., Suite 1000
Washington, DC 20024

April 20, 2020

---

[14] Gray V.S. at 12, 16. No CSAs were modeled because none are outstanding.

[15] 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 2019. This is the same methodology approved by the Board in *Railroad Cost of Capital –2018,* EP 558 (Sub-No. 22), slip op. at 6. Gray V.S. at 18-23.

CERTIFICATE OF SERVICE

I hereby certify that on this 20th day of April, 2020, 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. 23)

RAILROAD COST OF CAPITAL — 2019

VERIFIED STATEMENT

OF

JOHN T. GRAY

SENIOR VICE PRESIDENT — POLICY AND ECONOMICS

ASSOCIATION OF AMERICAN RAILROADS

April 20, 2020

Table of Contents

Page

I. Introduction 1

II. Determining the Cost of Capital 3

A. Defining the Cost of Capital 3
B. The Composite Railroad Approach 3
C. Selection of Railroads for Analysis 4
D. Types of Railroad Capital 5

III. Debt Capital in 2019 6

A. Bonds, Notes and Debentures 7
1. Market Value of Bonds, Notes and Debentures 8
2. Current Cost of Bonds, Notes and Debentures 10
B. Equipment Trust Certificates 11
C. Conditional Sales Agreements 15
D. All Other Debt 16
E. Market Value of Debt 17
F. Flotation Costs for Debt Capital 18
G. Conclusion as to the Cost of Debt Capital 23

IV. Common Equity Capital in 2019 24

A. The Market Value of Common Equity Capital 24
B. The Capital Asset Pricing Model (CAPM) 26
1. Risk Free Rate (RF) 28
2. Market Risk Premium (MRP) 29
3. Beta 31
4. Cost of Common Equity Using the CAPM 36
C. The Multi-Stage Discounted Cash Flow Model 36
1. Cash Flows 38
2. Growth Rates 41
3. Market Values 46
4. Cost of Common Equity Using the MSDCF Model 47
D. Conclusion as to Cost of Common Equity Capital 49

V. Preferred Equity Capital in 2019 50

A. Overview of Preferred Stock 50
B. The Market Value of Preferred Equity Capital 52

Table of Contents (continued)

C. The Cost of Preferred Equity Capital 52

VI. The Overall Cost of Capital in 2019 54

A. Determination of Market Value Weights 54

B. The Overall Cost of Capital 55

VII. Qualifications of John T. Gray 56

List of Tables

Page

1. Evaluation of Class I Railroads....4
2. Bonds, Notes and Debentures - Average Market Value....9
3. Bonds, Notes and Debentures - Weighted Current Cost.... 10
4. History of Premiums for Equipment Trust Certificates (ETC)....13
5. Summary of Equipment Trust Certificates Modeled for 2019....14
6. Market Value of Debt....18
7. Flotation Costs for Equipment Trust Certificates....22
8. Flotation Costs for Debt....23
9. Composite Current Cost of Debt....23
10. Average Market Value for Common Equity in 2019....24
11. 20-Year U.S. Treasury Bonds 2010 - 2019....29
12. Cost of Common Equity Using STB's Capital Asset Pricing Model....36
13. Example Cash Flow Calculations for UNP in 2019....39
14. 2019 Thomson Median Growth Rate Estimates....42
15. Equity Market Value on Year-End, 2019....46
16. Cost of Equity Using STB's Ibbotson MSDCF....48
17. Cost of Common Equity Capital....50
18. Average Market Value for Preferred Equity in 2019....52
19. Cost of Preferred Equity Capital....54
20. Capital Structure and Weights....55
21. Weighted Current Cost of Capital....55

List of Charts

Page

1. S&P 500 (2019 vs. 2018)....26

List of Appendices

Appendix A — Bonds, Notes and Debentures

Appendix B — Interest Rates on Selected Government Instruments (Yield Curve)

Appendix C — Equipment Trust Certificates

Appendix D — 2019 Market Value of Debt

Appendix E — 2019 Flotation Costs for Bonds

Appendix F — 2019 Current Cost of Debt

Appendix G — Market Value for Common Equity (2019)

Appendix H — Historical Risk Free Rates and Market Risk Premiums

Appendix I — AAR Regression for 2019 Beta

Appendix J — Cost of Common Equity Using the Multi-Stage DCF model (formula)

Appendix K — Cash Flow Calculation

Appendix L — 2019 Median Growth Rates for MSDCF

Appendix M — Stage 3 Growth Rate for MSDCF

Appendix N — Market Value Data for MSDCF

Appendix O — 2019 Cost of Equity Using STB's MSDCF

Appendix P — 2019 Preferred Equity

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 26, 2020 (served February 27), instituting a proceeding to determine the railroad industry's 2019

cost of capital — Ex Parte No. 558 (Sub-No. 23), *Railroad Cost of Capital — 2019* ("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. 22); 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. 22) – 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. 22). 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 2019 cost of capital for the railroad industry is 9.34 percent. This estimate is based on a current cost of debt of 3.48 percent, a cost of common equity capital of 10.67 percent; a cost of preferred equity of 3.64 percent; and market value weights for debt, common equity, and preferred equity of 18.54 percent, 81.46 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. 23 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 (2019).

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
2019

Class I Railroad	Parent	Stock Symbol	Dividends Throughout 2019	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 2018 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 2019, and the railroad is less than 50% of the company's assets.[2] Based on data from Annual Report Form R-1 for 2019, 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, 98 percent of the cost of debt is calculated using bonds and similar instruments (including notes and debentures). The

[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 2018 as reported in the AAR's *Railroad Facts* book, 2019 edition: CNGT was 32 percent of CN, and SOO was 28 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 2019, BNSF accounted 10.8 percent of Berkshire Hathaway assets. Among the many other diverse subsidiaries of Berkshire Hathaway are GEICO, Fruit of the Loom, Helzberg Diamonds and Dairy Queen. The company also owns pipelines, manufacturers, numerous automobile dealerships, real estate companies, and newspapers.

remaining 2 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 2019 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 2018 Cost of Capital decision. The other method is calculated using the somewhat more forward looking Multi-Stage Discounted Cash Flow model (MSDCF) methodology prescribed by the Board in the 2018 Cost of Capital Decision. The cost of preferred equity capital has been calculated using a simple dividend yield method, as used in the 2018 Cost of Capital Decision. Calculations for all three types of capital are based on data through 2019. 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 2019

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]

---

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

[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. 22).

(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.

(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 2019, yields and prices of the sample railroads' bonds, notes

[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

and debentures were obtained from Bloomberg.[7] This source is the same data source used since the 2011 cost of capital determination. We were able to find data for 126 unique CUSIPs (bond identifiers).[8] Appendix A lists market value data for 129 bonds because three set of notes was issued twice during 2018 and 2019, and the portions needed to be split for prorating purposes.[9] The 129 bonds represent 99.3 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 129 bonds with market data in 2019, 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

---

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/

[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 three cases, a portion of a series of notes was issued in 2019 after the original 2018 issue. 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 129 "bonds" and 126 unique CUSIPs. See bonds 14, 15, 73, 74, 75, and 76 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.

of December 31, 2019.[11] Where market prices are not available (i.e., for instruments that did not trade or were not found in the Bloomberg database), the "face value" of the bond is assumed to be the price investors would pay. This assumption may slightly overstate the market value of some issues and understate the value of others, depending upon the relationship of the instruments' coupon rate and the current market rate. However, this possible variation is not likely to 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 99.3 percent of the book value of bonds is priced at market. Table 2 summarizes the results of the market value calculations for 2019. The market value for bonds, notes, and debentures that traded is $53.26 billion, which is 99.4 percent of the total market value of $53.58 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	$16,538,802	$254,338	$16,793,140	31.05 %
KSU	$2,604,342	$70,181	2,674,523	4.89
NSC	$12,987,860	$0	12,987,860	24.39
UNP	$21,129,350	$0	21,129,350	39.67
Total	$53,260,353	$324,520	$53,584,873	100.00 %
* The traded weight for KSU, 5.573638%, was rounded up instead of down to force the total to be exactly 100.00%.				
Prior Year	$43,274,930	$343,951	$43,618,880	
Change	23.1%	-5.6%	22.8%	

[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.

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

Total market value for bonds is up 22.8 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 three of the four railroads.

Appendix A lists details for each of the 129 bonds, notes, and debentures belonging to the composite railroad that have trading data available for 2019 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 are also three cases 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 3.420 percent, which is over half a percentage point (0.675) lower than 2018's figure of 4.095 percent.

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

Railroad Co.	Weight	Current Cost
CSX	31.05 %	3.561 %
KSU	4.89	3.639
NSC	24.39	3.496
UNP	39.67	3.235
Total	100.00 %	3.420 %

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 129 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 3.420 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 2019, this percentage is 1.74 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

[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.

may be thought of as a series of individual, annually-retiring bonds. In fact, when ETCs are issued, each of the maturities is sold independently from the others. A serially issued debt instrument provides an investor with the ability to purchase only those maturities of particular interest. To correctly compute the composite yield on a serially issued bond, the internal rate of return on the bond's principal and interest payments must be calculated.

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

historical spreads used since 2000 and the spread proposed for 2019.[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	Proposed for EP 558 (Sub-No. 23)	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 2019 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 2019
($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	961,565	917,759	939,662	2.783%	951,588	26,483	4
Total	$961,565	$917,759	$939,662	2.783%	$951,588	$26,483	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:

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

Weighing each railroad's yield (there was only one railroad) by its current market value for modeled ETCs results in a current cost of 2.783 percent. The average rate is lower than the 3.593 percent found for 2018. In this year's case, the premium used in the model is the same as last year – so the lower yield curve for 2019 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 $951.59 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

---

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

1997 relationship between CSAs and ETCs to determine the yield spread over government bonds. As in other recent years, no CSAs were outstanding in 2019 – so none were modeled and none were added to Miscellaneous Debt. No CSAs have been modeled since 2010, and none have been outstanding (non-modeled or current) since 2014. There is no appendix for CSAs.

D. All Other Debt

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

Capital leases are contracts between two parties and as such take many forms.[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 2019 is $620.3 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 $672.5 million because in 2019 it consists mostly of discounts and unamortized debt issuance costs.

Capital leases and miscellaneous debt net to only negative $52.3 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 only negative 0.10 percent. Miscellaneous debt is lower than it was for 2018, and much of the decrease was caused by capital leases. 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 $54,484 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	$53,584,873	98.35 %	98.26 %
Equipment Trust Certificates	951,588	1.75	1.74
Conditional Sales Agreements	0	0.00	0.00
Subtotal	54,536,460	100.10	100.00 %
All Other Debt*	-52,261	-0.10	
Total	$54,484,199	100.00 %	

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

Bonds, Notes, and Debentures (Bonds) account for 98.4 percent of the total market value. More detail can be found in Appendix D. As can be computed from that appendix, 99.4 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 2019, 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 2019 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 2019, 17 new issues were reported in seven filings, with some filings reporting multiple new issues. This total of 17 new issues is much higher than normal. A simple average of the 17 flotation costs is 0.075 points, which is .003 lower than the figure used by the Board for 2018 – although not substantially different. As before, debt exchanges have not been included. Pages 1 through 3 of Appendix E contain a table with input data and calculations. Pages 4 and 5 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

[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 .

included in my work papers. I believe the 17 new railroad debt issues, which were issued by four different railroads, provide the best information to determine flotation costs for 2019, and I have therefore used 0.075 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.

[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)	2.783%
Assumed Duration of New Instrument (Yrs)	15
Calculated	
Price After Flotation Costs	$99.11
Effective Yield Including Flotation Costs	2.856%
Difference Between Yields With and Without Floatation Costs =	
Flotation Cost as Percentage Points	**0.073%**

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 0.073 percentage points – which is .004 percentage points lower than the value for 2018 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 0.075 percentage points.

Table No. 8
Flotation Costs For Debt

Type of Debt	Market Weight	Flotation Cost
Bonds, Notes & Debentures	98.26%	0.075%
Equipment Trust Certificates	1.74%	0.073%
Conditional Sales Agreements	0.00%	not calculated
Total	100.00%	0.075%

This flotation cost for 2019 is 0.003 percentage points lower than the number used by the Board in its 2018 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. For this year, weighting was almost irrelevant, since the ETC flotation cost was almost the same as that 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	98.26%	3.420%
Equipment Trust Certificates	1.74%	2.783%
Conditional Sales Agreements	0.00%	--
Subtotal	100.00%	3.409%
Flotation Costs		0.075%
Weighted Cost of Debt		3.484%
Weighted Cost of Debt (Rounded)		**3.48%**

The current weighted cost of debt before flotation costs is 3.409 percent. The addition of flotation costs results in a rounded cost of debt of 3.48 percent. Although this cost of debt is higher than the 2012 record low of 3.29 percent, as well as the second-lowest of 3.43 for 2016, it is lower than 2018's 4.16 percent.[20] A summary for the 2019 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 2019

A. The Market Value of Common Equity Capital

The market value of common equity is based on stock prices and shares outstanding for 2019. Table 10 below summarizes the market value calculation. The Weight column, which is not used directly in our calculation, is provided as additional information.

Table No. 10
Average Market Value
For Common Equity in 2019

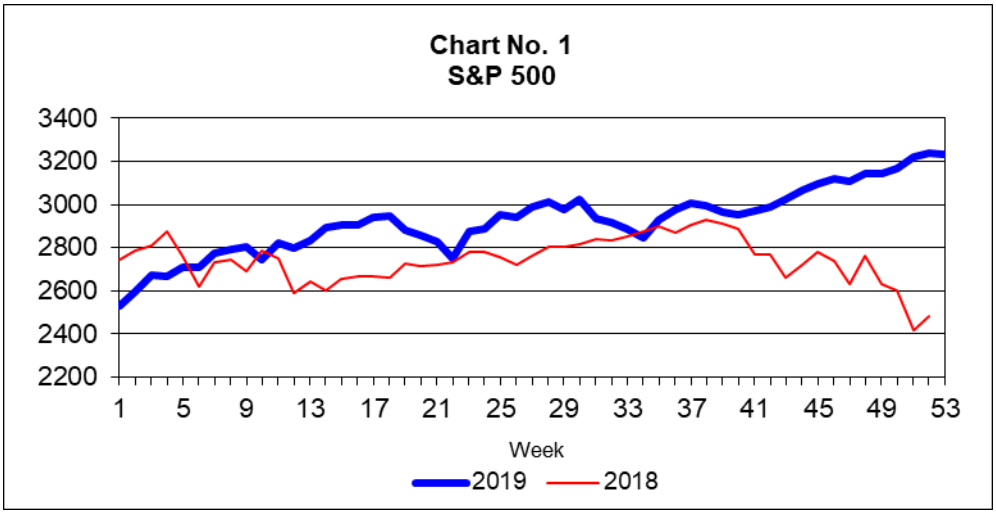
Railroad Co.	Value ($000)	Weight %
CSX	57,850,794.6	24.17
KSU	12,605,402.7	5.27
NSC	49,351,436.0	20.62
UNP	119,521,170.7	49.94
Total	$239,328,804.0	100.00 %
Prior Year	$219,319,376.7	
Change	9.1%	

[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 2019 edition lists, on page 20, data from 1990 through 2018.

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 2019.[21] Note that the week beginning on April 15 ends on Thursday April 18 because of the Good Friday holiday. Thus, any railroad shares outstanding change effective on April 19 would not happen until the following week because the market was closed on April 19. 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 2019 included 53 weeks. Week 1 began on Monday December 31, 2018, and is the first week after 2018's week 52 used in last year's calculation. The week beginning Monday December 30, 2019, qualifies as the final week for 2019. Thus, 2019 is a 53-week year for the purpose of calculating the market value of common equity.

The 53-week average market capitalization of the composite railroad (the four railroads that comprise the composite sample), listed in Table Number 10 and on page 5 of Appendix G, is $239.3 billion. This is a 9 percent increase from last year's average.

[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.



As shown in Chart 1, the stock market in general, as represented by the Standard & Poor's 500, was also higher in 2019 than most of 2018.

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. 23). 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 2018 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 2019.[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 2019 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 2016 was the lowest rate during that period.[24]

---

[22] *Railroad Cost of Capital – 2018*, EP 558 (Sub-No. 22) (STB served September 30, 2019).

[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 2010 - 2019

Year	Average Annual Rate
2010	4.03 %
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

Source: Federal Reserve

Using the average yield to maturity in 2019 for a 20-year U.S. Treasury Bond, as directed in STB Ex Parte No. 558 (Sub No. 23), the CAPM's risk-free rate is 2.40 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 Navigator* contains the "Long-

---

[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.

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 2019, the online Duff & Phelps *Cost of Capital Navigator* shows this premium as 7.15 percent. This is a small increase from the 6.91 percent figure used by the Board for 2018. (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 2019 equity risk premium.) Thus, I used 7.15 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.

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

[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*.

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 year, we used Bloomberg stock price data for 2019.

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 2014 (Week 0) through the last week of 2019 (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

[29] In some cases, stock did not trade on Friday. For example, trading during Week 224 ended Thursday, April 18, 2019, because Friday, April 19, 2019, 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 22, because of the Martin Luther King Day holiday on January 21.

ending Friday, January 9, 2015 (or beginning Monday January 5, 2015).[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 2015. The last week of 2019, Week 261, began on Monday, December 30. Week 0 began in 2014 on Monday December 29, 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]

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

---

[30] Following the Board's clarification in Ex Parte No. 558 (Sub-No. 12), the week beginning January 5, 2015, is the first week in the relevant year that contains 3 or more trading days. The previous week had only 1 trading days (January 2) in 2015.

[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 10, 2020, and the range of data was from 12/20/2014 through 1/10/2020.

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 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

[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.

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 1.094059306 using a spreadsheet, and 1.094059624 using SAS – both round to 1.0941.[37]

The 2019 beta is lower than the beta for 2018 (1.1120), and is the lowest since 2009. However, this is the eleventh consecutive year that the railroad beta has been above 1.0, further 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 1.0941 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.

[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.

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. 22). Table 12 is a summary of our CAPM cost of common equity calculation, which resulted in an average 2019 cost of equity estimate for the composite railroad of 10.22 percent. This is a decrease from 2018's 10.70 percent, despite the higher market risk premium.

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

Inputs to Model	**2019**	**2018**	
Risk-Free Rate	2.40 %	3.02 %	Table No. 11
Market Risk Premium	7.15	6.91	Appendix H
Beta	1.0941	1.1120	Appendix I
Calculation			
Risk-Free Rate	2.40	3.02	Given
Plus: Beta Adj. Risk Premiun	7.82	7.68	Beta x MRP
CAPM Cost of Equity	10.22 %	10.70 %	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

---

[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

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 2018 cost of capital.

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 2015 through 2019. 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.

---

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)

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 increase in Net Income for 2018 and 2019 was caused by the reduction in the corporate income tax rate.

Table No. 13
Example Cash Flow Calculations for CSX in 2019
($ in millions)

	2015	2016	2017	2018	2019	Total
Net Income	$1,968	$1,714	$1,840	$3,309	$3,331	$12,162
Less Extraord. Items	0	0	0	0	0	0
Inc. Bef. Extraord. Items (+)	$1,968	$1,714	$1,840	$3,309	$3,331	$12,162
Capital Expenditures (-)	$2,562	$2,398	$2,040	$1,745	$1,657	$10,402
Depreciation (+)	1,208	1,301	1,315	1,331	1,349	6,504
Deferred Taxes (+)	456	405	209	279	273	1,622
Cash Flow	$1,070	$1,022	$1,324	$3,174	$3,296	$9,886
Revenue (a.k.a. "Sales")	$11,811	$11,069	$11,408	$12,250	$11,937	$58,475
Ratio of Cash Flow to Sales (Smoothed Ibbotson-style) = ($9,886 / $58,475) =						0.16906
Initial Cash Flow in 2019 (Smoothed Ibbotson-style) = (0.16906 x $11,937) =						**$2,018.11**
Ratio of IBEI to Sales (Smoothed Ibbotson-style) = ($12,162 / $58,475) =						0.20799
Terminal Cash Flow input (Smoothed Ibbotson-style) = (0.20799 x $11,937) =						**$2,482.73**

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 2019, which is the initial cash flow in the model, is calculated by multiplying revenue for 2019 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 $2,018.11 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 $2,482.73 million. The model's terminal cash flow input is calculated by multiplying revenue for 2019 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 2019 10-K reports that were used as data sources for cash flows are included in my work papers. Data for prior years (2015-2018) used in this year's calculation are unchanged from last year's submission – unless restated/revised data were found in the 2019 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 (2019) 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 2019, and stock prices as of January 3, 2020 – the prices at the end of the last full week for 2019.[41] Each growth rate projection was reviewed by the brokerage firm's analyst during 2019, 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)

---

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

[41] Friday, January 3, 2020 was the last trading day for the week.

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 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
2019 Thomson Median Growth Rate Estimates

Company	Stock Symbol	Growth Rate
CSX Corporation	CSX	8.80 %
Kansas City Southern	KSU	14.54
Norfolk Southern Corporation	NSC	9.72
Union Pacific Corporation	UNP	10.35
Simple Average		10.85

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

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

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 10.85 percent, which is a large decrease from 2018 (19.88 percent). Although it is lower than the median growth rates used in 2018, it is in line with the rates used for 2008 through 2017. For all railroads in the Morningstar/Ibbotson MSDCF model, a second stage growth rate of 10.85 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

---

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

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

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

As summarized on page 1 of Appendix M, the long-run expected nominal growth rate of the U.S. economy (Stage 3 growth rate of the MSDCF) is the long-term expected growth rate for real GDP plus the long-term expected inflation rate. The real GDP growth rate is simply a historical compound growth rate calculated from Bureau of Economic Analysis data beginning in 1929, and it is illustrated on pages 2 through 4 of Appendix M. This procedure has been used, and accepted, since the 2013 Cost of Capital determination, and it is the same method used by Morningstar for 2008 through 2012. Page 2 of Appendix M has a replication of the Morningstar long-term real GDP growth rate calculation for 2009 through 2012, and AAR has continued this calculation (now using 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 2019 is 3.21 percent – very close to the 3.22 percent used for 2018.

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 2018 cost of capital determinations, and has been used again for 2019. Comparing yields for long-term government bonds to inflation indexed bonds, I calculate an expected long-term inflation rate of 1.86 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 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 2019 is 5.07 percent (3.21 + 1.86 as also shown on page 1 of Appendix M), which is higher than the 5.00 used for 2018. Although real growth in output is very close to the previous year, expected

[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.

inflation is up. This caused the increase in the Stage 3 Growth rate calculated for 2019. This is the same method I used for the previous year.

3. Market Values

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

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

Table No. 15
Equity Market Value on January 3, 2020

Company	Stock Price	Shares Outstanding	Market Value ($mil)	Weight
CSX	$72.89	782,336,546	57,024.5	22.876 %
KSU	$155.26	99,119,608	15,389.3	6.174
NSC	$196.44	260,746,663	51,221.1	20.548
UNP	$180.98	694,199,885	125,636.3	50.401
Total		1,836,402,702	$249,271.2	100.000 %

As directed by the Board, I have used stock prices (from Yahoo Finance) for January 3, 2020, the last trading day of the week that qualifies as the last week of 2019 for

cost of capital purposes. I have also used the shares outstanding for that day from the 2019 Q3 10-Q reports (the latest information available prior to January 3, 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. 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 2018 filing. Using an initial cash flow, an input for calculating the terminal cash flow, 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 the prior year, no problems were found with regular stock prices.

[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.

rates for each of the three stages, and a market value effective January 3, 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.

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

Company	Weight	Cost of Equity	Weighted Calculation
CSX	22.876%	11.10 %	2.54
KSU	6.174%	10.97	0.68
NSC	20.548%	11.06	2.27
UNP	50.401%	11.17	5.63
Total	100.000%		
Weighted Current Cost of Equity			**11.12 %**

Thus, the MSDCF produces a cost of common equity of 11.12 percent for 2019 – a decrease from the 17.01 percent used by the Board for 2018. Given lower interest rates, it is logical that investors expect lower returns on their investments. Despite the decrease, the 2019 cost of equity is in line with cost of equities used by the Board from 2014 to 2017.

[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.

D. Conclusion as to the Cost of Common Equity Capital

In the STB's Ex Parte No. 558 (Sub-No. 23) decision served February 27, 2020, the Board specified that comments "should focus … using the methodology followed in *Railroad Cost of Capital – 2018"*, 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 recently-signed 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 2019 is 10.67 percent, which is below the 13.86 percent decided for 2018.

---

[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.

Table No. 17
Cost of of Common Equity Capital

Model		
Capital Asset Pricing Model	10.22 %	From Table No. 12
Multi-Stage Discounted Cash Flow	11.12	From Table No. 16
Cost of Common Equity	10.67 %	Average

V. Preferred Equity Capital in 2019

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 2019, although the market value of the preferred stock remains very small.

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 2019. 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 2019

Railroad Co.	Value ($000)	Weight %
CSX	$0.0	0.00
KSU	6,108.3	100.00
NSC	0.0	0.00
UNP	0.0	0.00
Total	$6,108.3	100.00 %
Prior Year	$6,173.4	

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 2018. 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 3.64 percent, a decrease from the 3.70 percent calculated for 2018. 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.

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

Table No. 19
Cost of Preferred Equity Capital

Company	Weight	Cost of Equity	Weighted Calculation
CSX	0.00%	-- %	0.00
KSU	100.00%	3.64	3.64
NSC	0.00%	--	0.00
UNP	0.00%	--	0.00
Total	100.00%		
Weighted Current Cost of Equity			**3.64 %**

VI. The Overall Cost of Capital In 2019

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 $54.5 billion, $239.3 billion, and $6.1 million (not 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 2019 has weights for debt, common equity, and preferred equity of 18.54 percent, 81.46 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

		2019		2018	
	Source Table	Market Value (mil)	Capital Structure Weight	Market Value (mil)	Capital Structure Weight
Debt	6	$54,484.2	18.54 %	$44,652.0	16.92 %
Common Equity	10	239,328.8	81.46 *	219,319.4	83.08
Preferred Equity	18	6.1	0.00	6.2	0.00
Total		$293,819.1	100.00 %	$263,977.5	100.00 %

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

The market value for debt and common equity increased, while preferred stock decreased from the prior year. Weights shifted closer to their values for 2015. Debt increased 1.62 percentage points from 2018, 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 2019 overall cost of capital of 9.34 percent, as shown in Table 21. This figure is similar to the overall cost of capital found for 2015.

Table No. 21
Weighted Current Cost of Capital for 2019

	Source Table	Capital Structure Weight	Current Cost
Debt	11	18.54 %	3.48 %
Common Equity	18	81.46	10.67
Preferred Equity	20	0.00	3.64
Total		100.000 %	
Weighted Current Cost of Capital			**9.34 %**

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, D.C. 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-13**
Kansas City Southern	**A-48**
Norfolk Southern Corporation	**A-61**
Union Pacific Corporation	**A-94**

CSX Corporation
12/31/2019

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
						Traded						
1	Notes	CSX Corp.	1	12641LBD4	9.870%	2/12/2021	$10,000	$10,000	109.491	$10,949	3.520%	$385
2	Notes	CSX Corp.	2	126408GV9	4.250%	6/1/2021	$350,000	$350,000	102.804	$359,813	2.660%	$9,571
3	Notes	CSX Corp.	3	126408AQ6	8.100%	9/15/2022	$69,081	$69,081	114.556	$79,136	3.190%	$2,524
4	Notes	CSX Corp.	4	126408AM5	8.625%	5/15/2022	$81,517	$81,517	115.213	$93,918	2.930%	$2,752
5	Notes	CSX Corp.	5	126408GZ0	3.700%	11/1/2023	$500,000	$500,000	104.534	$522,669	2.550%	$13,328
6	Notes	CSX Corp.	6	126408HB2	3.400%	8/1/2024	$550,000	$550,000	103.991	$571,949	2.530%	$14,470
7	Notes	CSX Corp.	7	126408HD8	3.350%	11/1/2025	$600,000	$600,000	103.555	$621,331	2.720%	$16,900
8	Notes	CSX Corp.	8	126408HE6	2.600%	11/1/2026	$700,000	$700,000	98.453	$689,168	2.830%	$19,503
9	Notes	CSX Corp.	9	126408BP7	7.250%	5/1/2027	$83,312	$83,312	123.126	$102,579	3.780%	$3,877
10	Notes	CSX Corp.	10	126408BM4	7.950%	5/1/2027	$64,266	$64,266	126.319	$81,180	3.980%	$3,231
11	Notes	CSX Corp.	11	126408HH9	3.250%	6/1/2027	$850,000	$850,000	102.125	$868,065	2.940%	$25,521
12	Notes	CSX Corp.	12	12641LBU6	6.800%	12/1/2028	$200,000	$200,000	126.196	$252,392	3.500%	$8,834
13	Notes	CSX Corp.	13	126408HJ5	3.800%	3/1/2028	$800,000	$800,000	105.950	$847,602	3.010%	$25,513
14	Notes	CSX Corp.	14	126408HM8 *	4.250%	3/15/2029	$350,000	$350,000	109.763	$384,172	3.070%	$11,794
15	Notes (New)	CSX Corp.	15	126408HM8 *	4.250%	3/15/2029	$600,000	**$500,000**	110.332	$551,660	3.000%	$16,550
16	Notes (New)	CSX Corp.	16	126408HQ9	2.400%	2/15/2030	$400,000	**$116,667**	98.075	$114,421	2.620%	$2,998
17	Notes	CSX Corp.	17	126408GH0	6.000%	10/1/2036	$400,000	$400,000	124.882	$499,529	3.990%	$19,931
18	Notes	CSX Corp.	18	126408GK3	6.150%	5/1/2037	$700,000	$700,000	127.537	$892,761	3.980%	$35,532
19	Notes	CSX Corp.	19	126408GP2	7.450%	4/1/2038	$79,226	$79,226	136.639	$108,254	4.530%	$4,904
20	Notes	CSX Corp.	20	126408GS6	6.220%	4/30/2040	$660,000	$660,000	130.069	$858,457	4.070%	$34,939
21	Notes	CSX Corp.	21	126408GU1	5.500%	4/15/2041	$550,000	$550,000	120.994	$665,467	4.050%	$26,951
22	Notes	CSX Corp.	22	126408GW7	4.750%	5/30/2042	$600,000	$600,000	112.518	$675,110	3.930%	$26,532
23	Notes	CSX Corp.	23	126408GX5	4.400%	3/1/2043	$300,000	$300,000	107.786	$323,357	3.900%	$12,611
24	Notes	CSX Corp.	24	126408GY3	4.100%	3/15/2044	$800,000	$800,000	104.299	$834,395	3.840%	$32,041
25	Notes	CSX Corp.	25	126408HF3	3.800%	11/1/2046	$800,000	$800,000	100.067	$800,532	3.810%	$30,500
26	Notes	CSX Corp.	26	126408HK2	4.300%	3/1/2048	$850,000	$850,000	107.810	$916,385	3.860%	$35,372
27	Notes	CSX Corp.	27	126408HN6	4.750%	11/15/2048	$650,000	$650,000	114.916	$746,951	3.910%	$29,206
28	Notes (New)	CSX Corp.	28	126408HP1	4.500%	3/15/2049	$400,000	**$333,333**	111.923	$373,076	3.840%	$14,326
29	Notes (New)	CSX Corp.	29	126408HR7	3.350%	9/15/2049	$600,000	**$175,000**	98.771	$172,849	3.420%	$5,911
30	Notes	CSX Corp.	30	126408HC0	3.950%	5/1/2050	$600,000	$600,000	101.677	$610,060	3.880%	$23,670
31	Notes	CSX Corp.	31	126408HA4	4.500%	8/1/2054	$450,000	$450,000	108.947	$490,262	4.040%	$19,807
32	Notes	CSX Corp.	32	126408HG1	4.250%	11/1/2066	$700,000	$700,000	100.420	$702,937	4.250%	$29,875
33	Notes	CSX Corp.	33	126408HL0	4.650%	3/1/2068	$350,000	$350,000	106.512	$372,792	4.350%	$16,216
34	Notes	CSXT - Conrail	34	126410LL1	7.875%	5/15/2043	$99,989	$99,989	148.521	$148,505	4.540%	$6,742
35	Sec'd Eq Notes	CSXT	35	126410LM9	6.251%	1/15/2023	$178,095	$178,095	110.122	$196,121	3.130%	$6,139
Total							**$15,975,486**	**$15,100,486**		**$16,538,802**	**3.561%**	**$588,959**

* CUSIP 126408HM8 was offered during 2018 and 2019 in two portions at differing times, and is therefore split (this time) herein for weighting purposes.

CSX Corporation
12/31/2019

	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.			2.890%	10/22/2044	73,304	73,304	100.000	$73,304		
2	Conrail Tax Note	CSXT			2.890%	10/22/2044	151,334	151,334	100.000	$151,334		
3	Other Notes	TORCO Toledo Ore Railroad Co.			6.450%	12/15/2021	29,700	29,700	100.000	$29,700		
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							**$254,338**	**$254,338**		**$254,338**		

CSX Corporation
12/31/2019

	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 2020						
1	Notes	CSXT - Conrail		126410LK3	9.750%	6/15/2020	227,171					
2												
3												
4												
5												
6												
7												
8												
9												
10												
Total							**$227,171**					

	Grand Totals		
Total Traded and Trading Data Not Available	**$16,229,824**	**$15,354,824**	**$16,793,140**
Grand Total (for reconciliation to carrier data only)	**$16,456,995**		

From CSX:

Corporate Notes	$15,770,706
Convertible Debt	0
CSXT Notes	478,494
Secured Equipment Notes	178,095
Other Notes	29,700
Total	**$16,456,995**

Kansas City Southern Corporation

12/31/2019

	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	36	485188AN6	4.300%	5/15/2043	$1,179	$1,179	104.079	$1,227	4.050%	$50
2	Sr Note	KCSR	37	485188AM8	3.850%	11/15/2023	$776	$776	101.640	$789	3.420%	$27
3	Sr Note	KCSR	38	485188AP1	4.950%	8/15/2045	$792	$792	107.740	$853	4.460%	$38
4	Sr Note	KCS	39	485170AF1	7.000%	12/15/2025	$221	$221	114.076	$252	4.440%	$11
5	Sr Note	KCS	40	485170AQ7	4.300%	5/15/2043	$448,651	$448,651	103.651	$465,031	4.080%	$18,973
6	Sr Note	KCS	41	485170AR5	3.850%	11/15/2023	$199,224	$199,224	103.390	$205,977	2.990%	$6,159
7	Sr Note	KCS	42	485170AS3	4.950%	8/15/2045	$499,165	$499,165	113.745	$567,777	4.100%	$23,279
8	Sr Note	KCS	43	485170AV6	3.000%	5/15/2023	$439,123	$439,123	101.212	$444,445	2.640%	$11,733
9	Sr Note	KCS	44	485170BA1	3.125%	6/1/2026	$250,000	$250,000	99.162	$247,905	3.250%	$8,057
10	Sr Note	KCS	45	485170BB9	4.700%	5/1/2048	$500,000	$500,000	111.449	$557,247	4.040%	$22,513
11	Sr Note (New)	KCS	46	485170BD5	2.875%	11/15/2029	$425,000	**$53,125**	99.992	$53,121	2.880%	$1,530
12	Sr Note (New)	KCS	47	485170BC7	4.200%	11/15/2069	$425,000	**$53,125**	102.040	$54,208	4.110%	$2,228
13	Sr Note	KCSM	48	485161AS2	3.000%	5/15/2023	$5,560	$5,560	99.118	$5,511	3.230%	$178
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												
47												
Total							**$3,194,691**	**$2,450,941**		**$2,604,342**	**3.639%**	**$94,776**

Kansas City Southern Corporation

12/31/2019

	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	41,778.5	41,779	100.000	$41,779		
2	FRA RRIF	TexMex			4.290%	7/13/2030	28,402.8	28,403	100.000	$28,403		
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							**$70,181**	**$70,181**		**$70,181**		

Kansas City Southern Corporation

12/31/2019

	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 2020						
1	WF Loan	KCSM			9.310%	12/15/2020	12,058.8					
2												
3												
4												
5												
6												
7												
8												
9												
10												
Total							**$12,059**					

	Grand Totals		
Total Traded and Trading Data Not Available	**$3,264,872**	**$2,521,122**	**$2,674,523**
Grand Total (for reconciliation to carrier data only)	**3,276,931.1**		

From KSU:

KCSR	$44,525.5
TexMex	28,402.8
KCS	3,186,384.0
KCSM	17,618.8
Total	**3,276,931.1**

Norfolk Southern Corporation

12/31/2019

	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	49	655855FB5	7.875%	5/15/2043	$138,085	$138,085	150.483	$207,794	4.430%	$9,205
2	Notes	Series A NSC	50	655844AA6	9.000%	3/1/2021	$83,372	$83,372	108.859	$90,758	3.280%	$2,977
3	Notes	Senior	51	655844AQ1	7.250%	2/15/2031	$284,028	$284,028	135.161	$383,894	3.520%	$13,513
4	Notes	Senior	52	655844BG2	3.250%	12/1/2021	$500,000	$500,000	101.585	$507,924	2.520%	$12,800
5	Notes	Senior	53	655844BJ6	3.000%	4/1/2022	$600,000	$600,000	101.346	$608,075	2.450%	$14,898
6	Notes	Senior	54	655844BL1	2.903%	2/15/2023	$596,450	$596,450	101.290	$604,146	2.500%	$15,104
7	Notes	Senior 144A	55	655844BK3	2.903%	2/15/2023	$3,550	$3,550	101.354	$3,598	2.480%	$89
8	Notes	Senior	56	655844BD9	6.000%	5/23/2111	$121,731	$121,731	127.391	$155,074	4.710%	$7,304
9	Notes	Senior 2105	57	655844AV0	6.000%	3/15/2105	$184,118	$184,118	124.803	$229,785	4.810%	$11,053
10	Notes	Senior	58	655844AX6	5.640%	5/17/2029	$210,316	$210,316	118.897	$250,060	3.360%	$8,402
11	Notes	Senior	59	655844AW8	5.590%	5/17/2025	$251,172	$251,172	113.961	$286,238	2.950%	$8,444
12	Notes	Senior	60	655844BH0	4.837%	10/1/2041	$595,504	$595,504	115.050	$685,126	3.840%	$26,309
13	Notes	Senior	61	655844BM9	3.950%	10/1/2042	$600,000	$600,000	103.019	$618,115	3.770%	$23,303
14	Notes	Senior	62	655844BN7	4.800%	8/15/2043	$291,829	$291,829	112.433	$328,113	4.000%	$13,125
15	Notes	Senior	63	655844BP2	3.850%	1/15/2024	$400,000	$400,000	105.053	$420,211	2.630%	$11,052
16	Notes	Senior	64	655844BQ0	4.450%	6/15/2045	$500,000	$500,000	110.617	$553,086	3.820%	$21,128
17	Notes	Senior	65	655844BR8	4.650%	1/15/2046	$600,000	$600,000	113.716	$682,295	3.840%	$26,200
18	Notes	Senior	66	655844BS6	2.900%	6/15/2026	$600,000	$600,000	100.709	$604,254	2.780%	$16,798
19	Notes	Senior	67	655844BT4	3.150%	6/1/2027	$300,000	$300,000	101.947	$305,840	2.870%	$8,778
20	Notes	Senior	68	655844BX5	3.942%	11/1/2047	$749,997	$749,997	103.333	$774,994	3.760%	$29,140
21	Notes	Senior	69	655844BV9	4.050%	8/15/2052	$749,994	$749,994	104.075	$780,558	3.850%	$30,051
22	Notes	Senior	70	655844BY3	4.150%	2/28/2048	$700,000	$700,000	107.072	$749,501	3.760%	$28,181
23	Notes	Senior	71	655844CA4	3.650%	8/1/2025	$300,000	$300,000	105.135	$315,406	2.710%	$8,548
24	Notes (New)	Senior	72	655844CC0	4.100%	5/15/2049	$400,000	**$250,000**	110.080	$275,200	3.550%	$9,770
25	Notes	Senior	73	655844BZ0 *	3.800%	8/1/2028	$400,000	$400,000	106.977	$427,907	2.910%	$12,452
26	Notes (New)	Senior	74	655844BZ0 *	3.800%	8/1/2028	$200,000	**$125,000**	109.343	$136,679	2.610%	$3,567
27	Notes	Senior	75	655844CB2 *	5.100%	8/1/2118	$600,000	$600,000	113.202	$679,215	4.530%	$30,768
28	Notes (New)	Senior	76	655844CB2 *	5.100%	8/1/2118	$200,000	**$125,000**	118.728	$148,410	4.290%	$6,367
29	Notes (New)	Senior	77	655844CE6	2.550%	11/1/2029	$400,000	**$66,667**	99.878	$66,585	2.560%	$1,705
30	Notes (New)	Senior	78	655844CD8	3.400%	11/1/2049	$400,000	**$66,667**	99.953	$66,636	3.410%	$2,272
31	Conrail Notes	CR NSC 2027	79	655844AJ7	7.800%	5/15/2027	$319,135	$319,135	131.965	$421,146	3.150%	$13,266
32	Conrail Notes	CR NSC 2037	80	655844AF5	7.050%	5/1/2037	$178,995	$178,995	139.943	$250,492	3.920%	$9,819
33	Conrail Notes	CR NSC 2097	81	655844AK4	7.900%	5/15/2097	$225,222	$225,222	164.614	$370,746	4.770%	$17,685
Total							**$12,683,498**	**$11,716,831**		**$12,987,860**	**3.496%**	**$454,071**

* CUSIPs 655844BZ0 and 655844CB2 were offered during 2018 and 2019 in two portions at differing times, and is therefore split (this time) herein for weighting purposes.

Norfolk Southern Corporation

12/31/2019

	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		

Norfolk Southern Corporation

12/31/2019

	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 2020						
1	Debenture	Southern Railway		655855FA7	9.750%	6/15/2020	$313,741					
2												
3												
4												
5												
6												
7												
8												
9												
10												
Total							**$313,741**					

	Grand Totals		
Total Traded and Trading Data Not Available	**$12,683,498**	**$11,716,831**	**$12,987,860**
Grand Total (for reconciliation to carrier data only)	**$12,997,239**		

From NSC:

Income Debentures	$451,826
Medium Term Notes & Conrail Notes	12,545,413
Other Debt (Poca Dev)	0
Total	**$12,997,239**

Union Pacific Corporation
12/31/2019

	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.	82	907818CS5	5.375%	6/1/2033	$147,996	$147,996	120.415	$178,209	3.510%	$6,255
2	Debentures	UP Corp.	83	907818CX4	6.150%	5/1/2037	$99,098	$99,098	131.364	$130,179	3.730%	$4,856
3	Debentures	UP Corp.	84	907818CU0	6.250%	5/1/2034	$157,317	$157,317	128.379	$201,961	3.740%	$7,553
4	Debentures	UP Corp.	85	907818CF3	6.625%	2/1/2029	$394,083	$394,083	127.813	$503,689	3.210%	$16,168
5	Debentures	UP Corp.	86	907818BY3	7.125%	2/1/2028	$173,770	$173,770	129.249	$224,596	3.180%	$7,142
6	Notes	UP Corp.	87	907818DN5	2.750%	4/15/2023	$323,407	$323,407	100.845	$326,140	2.490%	$8,121
7	Notes	UP Corp.	88	907818EH7	2.750%	3/1/2026	$647,668	$647,668	99.943	$647,302	2.750%	$17,801
8	Notes (New)	UP Corp.	89	907818EZ7	2.950%	3/1/2022	$498,105	**$435,842**	101.595	$442,794	2.280%	$10,096
9	Notes	UP Corp.	90	907818DM7	2.950%	1/15/2023	$299,220	$299,220	101.367	$303,310	2.510%	$7,613
10	Notes	UP Corp.	91	907818EP9	3.000%	4/15/2027	$491,782	$491,782	101.529	$499,302	2.770%	$13,831
11	Notes (New)	UP Corp.	92	907818FA1	3.150%	3/1/2024	$496,586	**$434,513**	102.884	$447,043	2.460%	$10,997
12	Notes	UP Corp.	93	907818ET1	3.200%	6/8/2021	$598,380	$598,380	101.565	$607,744	2.300%	$13,978
13	Notes	UP Corp.	94	907818DY1	3.250%	1/15/2025	$348,025	$348,025	102.846	$357,930	2.680%	$9,593
14	Notes	UP Corp.	95	907818ED6	3.250%	8/15/2025	$499,071	$499,071	103.283	$515,455	2.650%	$13,660
15	Notes	UP Corp.	96	907818EK0	3.350%	8/15/2046	$296,110	$296,110	93.518	$276,917	3.750%	$10,384
16	Notes	UP Corp.	97	907818EB0	3.375%	2/1/2035	$445,262	$445,262	98.663	$439,308	3.500%	$15,376
17	Notes	UP Corp.	98	907818EU8	3.500%	6/8/2023	$646,230	$646,230	103.657	$669,865	2.480%	$16,613
18	Notes (New)	UP Corp.	99	907818FD5	3.550%	8/15/2039	$493,635	**$205,681**	104.615	$215,173	3.240%	$6,972
19	Notes	UP Corp.	100	907818EQ7	3.600%	9/15/2037	$494,956	$494,956	100.278	$496,333	3.590%	$17,818
20	Notes	UP Corp.	101	907818DR6	3.646%	2/15/2024	$394,171	$394,171	104.499	$411,906	2.580%	$10,627
21	Notes (New)	UP Corp.	102	907818FB9	3.700%	3/1/2029	$992,374	**$868,327**	106.594	$925,589	2.910%	$26,935
22	Notes	UP Corp.	103	907818DV7	3.750%	3/15/2024	$397,186	$397,186	104.830	$416,371	2.620%	$10,909
23	Notes	UP Corp.	104	907818ES3	3.750%	7/15/2025	$496,968	$496,968	105.845	$526,017	2.680%	$14,097
24	Notes	UP Corp.	105	907818EM6	3.799%	10/1/2051	$699,778	$699,778	100.158	$700,881	3.810%	$26,704
25	Notes (New)	UP Corp. 144A	106	907818FF0	3.839%	3/20/2060	$1,405,612	**$175,702**	102.569	$180,214	3.720%	$6,704
26	Notes	UP Corp.	107	907818EC8	3.875%	2/1/2055	$443,990	$443,990	98.729	$438,348	3.960%	$17,359
27	Notes	UP Corp.	108	907818EY0	3.950%	9/10/2028	$1,486,816	$1,486,816	107.944	$1,604,927	2.950%	$47,345
28	Notes (New)	UP Corp.	109	907818FE3	3.950%	8/15/2059	$491,023	**$204,593**	105.876	$216,614	3.670%	$7,950
29	Notes	UP Corp.	110	907818DG0	4.000%	2/1/2021	$499,199	$499,199	102.141	$509,887	2.520%	$12,849
30	Notes	UP Corp.	111	907818EN4	4.000%	4/15/2047	$488,862	$488,862	104.477	$510,750	3.750%	$19,153
31	Notes	UP Corp.	112	907818EF1	4.050%	11/15/2045	$489,908	$489,908	103.986	$509,435	3.820%	$19,460
32	Notes	UP Corp.	113	907818EJ3	4.050%	3/1/2046	$587,103	$587,103	104.309	$612,400	3.810%	$23,332
33	Notes	UP Corp.	114	907818ER5	4.100%	9/15/2067	$494,352	$494,352	98.583	$487,347	4.190%	$20,420
34	Notes	UP Corp.	115	907818DZ8	4.150%	1/15/2045	$342,133	$342,133	104.989	$359,200	3.850%	$13,829
35	Notes	UP Corp.	116	907818DK1	4.163%	7/15/2022	$699,609	$699,609	104.733	$732,720	2.480%	$18,171
36	Notes	UP Corp.	117	907818DP0	4.250%	4/15/2043	$318,271	$318,271	106.480	$338,894	3.840%	$13,014
37	Notes	UP Corp.	118	907818DL9	4.300%	6/15/2042	$297,200	$297,200	107.410	$319,222	3.820%	$12,194
38	Notes (New)	UP Corp.	119	907818FC7	4.300%	3/1/2049	$983,173	**$860,276**	110.660	$951,983	3.720%	$35,414
39	Notes	UP Corp.	120	907818EV6	4.375%	9/10/2038	$741,792	$741,792	109.999	$815,963	3.660%	$29,864
40	Notes	UP Corp.	121	907818EG9	4.375%	11/15/2065	$569,283	$569,283	103.781	$590,805	4.210%	$24,873
41	Notes	UP Corp.	122	907818EW4	4.500%	9/10/2048	$526,459	$526,459	112.685	$593,239	3.790%	$22,484
42	Notes	UP Corp.	123	907818DJ4	4.750%	9/15/2041	$231,446	$231,446	113.402	$262,465	3.860%	$10,131
43	Notes	UP Corp.	124	907818DU9	4.750%	12/15/2043	$187,785	$187,785	113.048	$212,288	3.930%	$8,343
44	Notes	UP Corp.	125	907818EX2	4.800%	9/10/2058	$75,731	$75,731	115.213	$87,252	4.040%	$3,525
45	Notes	UP Corp.	126	907818DT2	4.821%	2/1/2044	$136,354	$136,354	115.191	$157,067	3.870%	$6,079
46	Notes	UP Corp.	127	907818DX3	4.850%	6/15/2044	$83,250	$83,250	113.509	$94,496	4.000%	$3,780
47	Notes	UP Corp.	128	907818DF2	5.780%	7/15/2040	$63,067	$63,067	126.544	$79,808	3.920%	$3,128
48	Notes	UP Corp. 144A	129	907818DE5	5.780%	7/15/2040	$10	$10	126.602	$13	3.920%	$0
49												
50												
Total							**$22,173,606**	**$19,998,032**		**$21,129,350**	**3.235%**	**$683,500**

Union Pacific Corporation

12/31/2019

	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
12/31/2019

	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 2020						
1	Notes	UP Corp.		907818EA2	1.800%	2/1/2020	249,922					
2	Notes	UP Corp.		907818EE4	2.250%	6/19/2020	399,673					
3	Notes	UP Corp. Series B		90782ECK8	9.300%	1/17/2020	310					
4	Notes	UP Corp. Series C		90782EDE1	9.940%	4/1/2020	4,100					
5	Notes	UP Corp. Series C		90782ECU6	10.000%	4/10/2020	2,500					
6	Notes	UP Corp. Series C		90782EDG6	9.900%	4/15/2020	250					
7	Notes	UP Corp. Series C		90782EDJ0	9.900%	4/15/2020	525					
8												
9												
10												
Total							**$657,280**					

	Grand Totals		
Total Traded and Trading Data Not Available	**$22,173,606**	**$19,998,032**	**$21,129,350**
Grand Total (for reconciliation to carrier data only)	**$22,830,886**		

From UNP:

Corporate Debentures, Notes, Floating Rate Loans, and Commercial Paper	$23,280,817
Removal of Floating Rate Loans & Commercial Paper	-449,931
UP RR Debt Securities Outstanding	399,110
Removal of unamortized SOR Fees	890
Removal of Sale of Receivables	-400,000
Total	**$22,830,886**

CSX Corporation

1

Type:	Notes
Description:	CSX Corp.
CUSIP:	12641LBD4
Coupon Rate:	9.870%
Maturity Date:	2/12/2021
Amount Outstanding ($ 000)	$10,000
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	111.015	4.14 %
February	110.650	4.10
March	110.677	3.86
April	110.247	3.85
May	110.214	3.58
June	110.143	3.35
July	109.536	3.41
August	109.395	3.14
September	108.645	3.32
October	108.300	3.16
November	107.679	3.24
December	107.388	3.04
Average	109.491	3.52 %

Source: Bloomberg

CSX Corporation

2

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GV9
Coupon Rate:	4.250%
Maturity Date:	6/1/2021
Amount Outstanding ($ 000)	$350,000
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	102.519	3.12 %
February	102.366	3.15
March	102.774	2.92
April	102.563	2.97
May	103.064	2.66
June	103.202	2.53
July	102.897	2.62
August	103.180	2.37
September	102.891	2.46
October	102.847	2.40
November	102.709	2.39
December	102.632	2.34
Average	102.804	2.66 %

Source: Bloomberg

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 2019	Price	Yield
January	113.304	4.10 %
February	114.471	3.69
March	115.772	3.24
April	114.811	3.41
May	115.877	2.98
June	115.834	2.89
July	115.203	2.96
August	114.827	2.95
September	114.215	3.03
October	114.001	2.96
November	113.388	3.04
December	112.966	3.06
Average	114.556	3.19 %

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 2019	Price	Yield
January	114.947	3.74 %
February	114.796	3.68
March	115.318	3.41
April	115.162	3.33
May	116.256	2.84
June	116.448	2.63
July	115.583	2.77
August	115.943	2.48
September	115.140	2.61
October	114.843	2.53
November	114.169	2.62
December	113.949	2.52
Average	115.213	2.93 %

Source: Bloomberg

CSX Corporation

5

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GZ0
Coupon Rate:	3.700%
Maturity Date:	11/1/2023
Amount Outstanding ($ 000)	$500,000
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	101.783	3.29 %
February	101.756	3.29
March	103.151	2.96
April	103.312	2.91
May	104.303	2.66
June	105.188	2.43
July	104.834	2.49
August	106.323	2.10
September	105.762	2.22
October	106.060	2.11
November	106.051	2.08
December	105.882	2.09
Average	104.534	2.55 %

Source: Bloomberg

CSX Corporation

6

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 2019	Price	Yield
January	101.004	3.20 %
February	100.519	3.29
March	101.921	3.01
April	102.559	2.87
May	103.650	2.64
June	104.778	2.40
July	104.570	2.42
August	106.296	2.05
September	105.491	2.20
October	105.866	2.09
November	105.430	2.17
December	105.804	2.06
Average	103.991	2.53 %

Source: Bloomberg

CSX Corporation

7

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 2019	Price	Yield
January	98.987	3.52 %
February	98.948	3.53
March	100.660	3.24
April	101.553	3.08
May	103.236	2.80
June	104.892	2.51
July	104.621	2.55
August	106.436	2.23
September	105.647	2.35
October	106.028	2.27
November	105.626	2.33
December	106.027	2.24
Average	103.555	2.72 %

Source: Bloomberg

CSX Corporation

8

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 2019	Price	Yield
January	92.778	3.68 %
February	92.598	3.72
March	95.081	3.34
April	95.707	3.25
May	97.062	3.05
June	98.968	2.76
July	99.856	2.62
August	102.269	2.26
September	101.251	2.41
October	101.742	2.33
November	102.484	2.21
December	101.634	2.34
Average	98.453	2.83 %

Source: Bloomberg

CSX Corporation

9

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 2019	Price	Yield
January	117.906	4.61 %
February	118.255	4.55
March	120.416	4.24
April	120.435	4.21
May	122.956	3.85
June	123.038	3.82
July	122.534	3.86
August	128.164	3.09
September	126.887	3.22
October	126.447	3.25
November	125.651	3.32
December	124.822	3.39
Average	123.126	3.78 %

Source: Bloomberg

CSX Corporation

10

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 2019	Price	Yield
January	122.292	4.66 %
February	123.820	4.44
March	126.012	4.13
April	125.990	4.11
May	128.550	3.75
June	127.052	3.91
July	127.418	3.83
August	128.921	3.60
September	127.365	3.77
October	127.016	3.78
November	126.151	3.86
December	125.243	3.95
Average	126.319	3.98 %

Source: Bloomberg

CSX Corporation

11

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 2019	Price	Yield
January	96.498	3.74 %
February	96.505	3.75
March	98.712	3.43
April	99.526	3.32
May	100.475	3.18
June	103.182	2.80
July	103.349	2.77
August	105.994	2.40
September	105.053	2.52
October	105.739	2.42
November	105.476	2.45
December	104.995	2.51
Average	102.125	2.94 %

Source: Bloomberg

CSX Corporation

12

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 2019	Price	Yield
January	118.277	4.48 %
February	119.495	4.33
March	122.210	4.01
April	122.897	3.91
May	125.777	3.57
June	127.681	3.35
July	127.201	3.38
August	131.316	2.91
September	130.754	2.95
October	130.528	2.94
November	129.662	3.01
December	128.552	3.11
Average	126.196	3.50 %

Source: Bloomberg

CSX Corporation

13

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 2019	Price	Yield
January	100.495	3.74 %
February	99.720	3.84
March	102.457	3.48
April	103.109	3.39
May	104.576	3.20
June	107.323	2.84
July	107.198	2.85
August	110.184	2.46
September	109.114	2.59
October	109.303	2.55
November	109.131	2.56
December	108.793	2.60
Average	105.950	3.01 %

Source: Bloomberg

CSX Corporation

14

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HM8
Coupon Rate:	4.250%
Maturity Date:	3/15/2029
Amount Outstanding ($ 000)	$350,000
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	103.508	3.83 %
February	102.963	3.89
March	106.325	3.49
April	106.630	3.45
May	108.180	3.27
June	111.191	2.92
July	111.387	2.89
August	115.078	2.47
September	113.030	2.68
October	113.526	2.61
November	112.791	2.68
December	112.552	2.70
Average	109.763	3.07 %

Source: Bloomberg

CSX Corporation

15

Type:	Notes (New)
Description:	CSX Corp.
CUSIP:	126408HM8
Coupon Rate:	4.250%
Maturity Date:	3/15/2029
Amount Outstanding ($ 000)	$600,000
Months Outstanding	10.0

End of Month in 2019	Price	Yield
January	*	* %
February	102.963	3.89
March	106.325	3.49
April	106.630	3.45
May	108.180	3.27
June	111.191	2.92
July	111.387	2.89
August	115.078	2.47
September	113.030	2.68
October	113.526	2.61
November	112.791	2.68
December	112.552	2.70
Average	110.332	3.00 %

Source: Bloomberg

Issued February 28, 2019
Interest accrues from November 15, 2018

* A portion of this set of notes (ID = 14) was offered earlier and traded in 2018. This portion (ID = 15) was offered later, and traded

CSX Corporation

16

Type:	Notes (New)
Description:	CSX Corp.
CUSIP:	126408HQ9
Coupon Rate:	2.400%
Maturity Date:	2/15/2030
Amount Outstanding ($ 000)	$400,000
Months Outstanding	3.5

End of Month in 2019	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	98.129	2.61
October	98.203	2.60
November	98.325	2.59
December	97.643	2.67
Average	98.075	2.62 %

Source: Bloomberg

Issued September 12, 2019
Interest accrues from September 12, 2019

CSX Corporation

17

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 2019	Price	Yield
January	117.524	4.55 %
February	116.086	4.65
March	120.008	4.35
April	120.547	4.31
May	122.339	4.18
June	125.430	3.95
July	125.115	3.97
August	131.800	3.51
September	128.988	3.69
October	129.571	3.64
November	131.060	3.54
December	130.119	3.59
Average	124.882	3.99 %

Source: Bloomberg

CSX Corporation

18

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 2019	Price	Yield
January	119.393	4.57 %
February	118.077	4.66
March	122.045	4.37
April	122.785	4.32
May	125.152	4.15
June	128.463	3.92
July	128.588	3.90
August	133.998	3.54
September	131.946	3.67
October	132.790	3.61
November	133.546	3.55
December	133.665	3.54
Average	127.537	3.98 %

Source: Bloomberg

CSX Corporation

19

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 2019	Price	Yield
January	127.019	5.20 %
February	127.177	5.19
March	131.613	4.88
April	131.200	4.90
May	136.133	4.57
June	137.932	4.45
July	137.459	4.47
August	146.417	3.91
September	143.454	4.08
October	142.002	4.16
November	141.041	4.21
December	138.223	4.38
Average	136.639	4.53 %

Source: Bloomberg

CSX Corporation

20

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 2019	Price	Yield
January	120.987	4.65 %
February	119.811	4.73
March	123.995	4.45
April	125.014	4.39
May	127.074	4.25
June	131.141	4.00
July	130.786	4.02
August	137.349	3.63
September	135.063	3.76
October	135.732	3.71
November	137.675	3.60
December	136.203	3.68
Average	130.069	4.07 %

Source: Bloomberg

CSX Corporation

21

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 2019	Price	Yield
January	112.149	4.62 %
February	110.725	4.71
March	115.356	4.40
April	116.186	4.35
May	118.277	4.21
June	121.786	3.99
July	122.534	3.95
August	129.544	3.53
September	125.476	3.76
October	126.556	3.70
November	127.023	3.67
December	126.317	3.70
Average	120.994	4.05 %

Source: Bloomberg

$300,000
250,000
$550,000

same CUSIP

CSX Corporation

22

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 2019	Price	Yield
January	103.303	4.52 %
February	102.422	4.58
March	106.683	4.29
April	108.040	4.20
May	110.462	4.05
June	113.837	3.84
July	113.880	3.83
August	120.066	3.47
September	116.787	3.65
October	118.263	3.57
November	118.373	3.56
December	118.104	3.57
Average	112.518	3.93 %

Source: Bloomberg

CSX Corporation

23

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 2019	Price	Yield
January	98.615	4.50 %
February	97.912	4.54
March	102.084	4.26
April	103.032	4.20
May	105.606	4.03
June	108.820	3.83
July	108.914	3.82
August	116.748	3.36
September	112.200	3.62
October	113.357	3.55
November	113.613	3.54
December	112.525	3.60
Average	107.786	3.90 %

Source: Bloomberg

CSX Corporation

24

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 2019	Price	Yield
January	95.265	4.41 %
February	94.451	4.47
March	98.910	4.17
April	99.598	4.13
May	101.081	4.03
June	104.849	3.80
July	105.677	3.75
August	112.691	3.34
September	109.093	3.54
October	109.710	3.50
November	110.241	3.47
December	110.027	3.48
Average	104.299	3.84 %

Source: Bloomberg

CSX Corporation

25

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 2019	Price	Yield
January	91.214	4.35 %
February	89.724	4.45
March	94.501	4.14
April	94.821	4.12
May	96.873	3.99
June	101.663	3.70
July	101.268	3.73
August	108.264	3.34
September	104.868	3.52
October	105.812	3.47
November	106.362	3.44
December	105.428	3.49
Average	100.067	3.81 %

Source: Bloomberg

CSX Corporation

26

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 2019	Price	Yield
January	98.051	4.42 %
February	97.217	4.47
March	101.829	4.19
April	102.498	4.15
May	104.745	4.02
June	108.754	3.80
July	108.747	3.80
August	116.582	3.39
September	112.526	3.59
October	113.818	3.53
November	115.235	3.45
December	113.718	3.53
Average	107.810	3.86 %

Source: Bloomberg

CSX Corporation

27

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 2019	Price	Yield
January	104.238	4.49 %
February	103.226	4.55
March	108.145	4.26
April	109.146	4.21
May	112.078	4.04
June	116.259	3.82
July	116.143	3.83
August	124.212	3.43
September	120.407	3.61
October	121.512	3.56
November	122.471	3.51
December	121.150	3.57
Average	114.916	3.91 %

Source: Bloomberg

CSX Corporation

28

Type:	Notes (New)
Description:	CSX Corp.
CUSIP:	126408HP1
Coupon Rate:	4.500%
Maturity Date:	3/15/2049
Amount Outstanding ($ 000)	$400,000
Months Outstanding	10.0

End of Month in 2019	Price	Yield
January	Not Traded	- %
February	99.408	4.54
March	104.763	4.22
April	105.296	4.19
May	108.042	4.03
June	112.481	3.80
July	111.909	3.82
August	120.169	3.41
September	116.275	3.60
October	117.581	3.53
November	117.953	3.51
December	117.273	3.55
Average	111.923	3.84 %

Source: Bloomberg

Issued February 28, 2019
Interest accrues from February 28, 2019

CSX Corporation

29

Type:	Notes (New)
Description:	CSX Corp.
CUSIP:	126408HR7
Coupon Rate:	3.350%
Maturity Date:	9/15/2049
Amount Outstanding ($ 000)	$600,000
Months Outstanding	3.5

End of Month in 2019	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	98.045	3.46
October	99.134	3.40
November	99.123	3.40
December	98.782	3.42
Average	98.771	3.42 %

Source: Bloomberg

Issued September 12, 2019
Interest accrues from September 12, 2019

CSX Corporation

30

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 2019	Price	Yield
January	91.151	4.48 %
February	89.919	4.56
March	95.172	4.23
April	96.247	4.17
May	99.341	3.99
June	102.402	3.82
July	102.246	3.83
August	110.733	3.39
September	107.072	3.57
October	108.306	3.50
November	109.215	3.46
December	108.315	3.50
Average	101.677	3.88 %

Source: Bloomberg

CSX Corporation

31

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 2019	Price	Yield
January	97.950	4.62 %
February	96.899	4.68
March	102.195	4.38
April	102.984	4.33
May	105.976	4.17
June	110.499	3.95
July	110.267	3.96
August	119.129	3.54
September	114.671	3.74
October	115.687	3.69
November	116.001	3.68
December	115.107	3.72
Average	108.947	4.04 %

Source: Bloomberg

CSX Corporation

32

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 2019	Price	Yield
January	89.555	4.81 %
February	87.742	4.92
March	93.072	4.61
April	93.155	4.61
May	96.688	4.42
June	102.173	4.15
July	101.283	4.19
August	109.858	3.80
September	106.641	3.94
October	108.249	3.87
November	109.161	3.83
December	107.457	3.90
Average	100.420	4.25 %

Source: Bloomberg

CSX Corporation

33

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 2019	Price	Yield
January	94.249	4.96 %
February	92.693	5.05
March	99.508	4.68
April	100.061	4.65
May	102.526	4.52
June	107.044	4.30
July	107.225	4.29
August	116.449	3.89
September	113.448	4.02
October	115.050	3.95
November	115.696	3.92
December	114.194	3.99
Average	106.512	4.35 %

Source: Bloomberg

CSX Corporation

34

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 2019	Price	Yield
January	135.842	5.25 %
February	135.294	5.28
March	142.081	4.89
April	144.866	4.73
May	149.780	4.47
June	149.012	4.50
July	149.202	4.49
August	157.137	4.09
September	153.756	4.25
October	154.713	4.19
November	155.720	4.14
December	154.852	4.18
Average	148.521	4.54 %

Source: Bloomberg

CSX Corporation

35

Type:	Sec'd Eq Notes
Description:	CSXT
CUSIP:	126410LM9
Coupon Rate:	6.251%
Maturity Date:	1/15/2023
Amount Outstanding ($ 000)	$178,095
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	108.527	3.90 %
February	108.346	3.90
March	109.285	3.60
April	108.500	3.77
May	109.943	3.31
June	110.251	3.16
July	110.661	2.98
August	111.684	2.60
September	110.243	2.96
October	111.080	2.62
November	111.027	2.55
December	111.915	2.17
Average	110.122	3.13 %

Source: Bloomberg

Kansas City Southern Corp.

36

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 2019	Price	Yield
January	94.181	4.70 %
February	95.338	4.62
March	98.134	4.43
April	98.447	4.41
May	100.742	4.25
June	103.852	4.05
July	104.957	3.98
August	111.908	3.55
September	109.499	3.69
October	111.619	3.57
November	111.100	3.60
December	109.171	3.71
Average	104.079	4.05 %

Source: Bloomberg

Kansas City Southern Corp.

37

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 2019	Price	Yield
January	99.596	3.94 %
February	99.862	3.88
March	100.392	3.76
April	100.045	3.84
May	101.300	3.53
June	102.445	3.25
July	101.671	3.43
August	104.125	2.80
September	102.986	3.07
October	103.020	3.05
November	102.301	3.23
December	101.931	3.31
Average	101.640	3.42 %

Source: Bloomberg

Kansas City Southern Corp.

38

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 2019	Price	Yield
January	102.294	4.80 %
February	98.964	5.02
March	103.731	4.70
April	103.332	4.73
May	106.991	4.49
June	107.272	4.48
July	107.102	4.49
August	116.873	3.91
September	114.100	4.06
October	112.392	4.16
November	111.251	4.23
December	108.573	4.39
Average	107.740	4.46 %

Source: Bloomberg

Kansas City Southern Corp.

39

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 2019	Price	Yield
January	110.435	5.17 %
February	110.040	5.22
March	112.146	4.85
April	111.725	4.90
May	113.478	4.59
June	114.678	4.37
July	115.025	4.28
August	117.300	3.87
September	116.012	4.05
October	116.394	3.95
November	116.017	3.99
December	115.658	4.02
Average	114.076	4.44 %

Source: Bloomberg

Kansas City Southern Corp.

40

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 2019	Price	Yield
January	92.531	4.83 %
February	92.404	4.84
March	97.991	4.44
April	98.037	4.43
May	103.436	4.07
June	101.957	4.17
July	104.492	4.01
August	112.640	3.51
September	109.850	3.67
October	110.842	3.61
November	110.413	3.64
December	109.217	3.71
Average	103.651	4.08 %

Source: Bloomberg

Kansas City Southern Corp.

41

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 2019	Price	Yield
January	100.679	3.69 %
February	100.566	3.72
March	102.079	3.36
April	102.345	3.29
May	103.495	3.00
June	103.698	2.94
July	103.423	2.99
August	105.177	2.54
September	104.914	2.58
October	105.144	2.50
November	104.668	2.60
December	104.486	2.62
Average	103.390	2.99 %

Source: Bloomberg

Kansas City Southern Corp.

42

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 2019	Price	Yield
January	102.861	4.76 %
February	103.627	4.71
March	107.633	4.46
April	106.865	4.50
May	111.958	4.19
June	113.709	4.09
July	114.502	4.04
August	123.364	3.56
September	120.455	3.71
October	120.344	3.72
November	120.530	3.70
December	119.096	3.78
Average	113.745	4.10 %

Source: Bloomberg

Kansas City Southern Corp.

43

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 2019	Price	Yield
January	98.085	3.49 %
February	98.440	3.40
March	100.130	2.97
April	100.278	2.93
May	101.361	2.64
June	101.880	2.49
July	101.647	2.54
August	102.953	2.16
September	102.478	2.28
October	102.795	2.17
November	102.333	2.29
December	102.164	2.33
Average	101.212	2.64 %

Source: Bloomberg

Kansas City Southern Corp.

44

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 2019	Price	Yield
January	94.787	3.95 %
February	94.314	4.04
March	96.221	3.73
April	96.077	3.76
May	98.202	3.42
June	99.244	3.25
July	100.061	3.12
August	102.612	2.70
September	101.929	2.81
October	102.175	2.76
November	101.906	2.80
December	102.414	2.71
Average	99.162	3.25 %

Source: Bloomberg

Kansas City Southern Corp.

45

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 2019	Price	Yield
January	99.621	4.72 %
February	100.511	4.67
March	104.682	4.41
April	104.589	4.42
May	107.153	4.27
June	111.251	4.04
July	112.881	3.95
August	122.792	3.44
September	119.009	3.63
October	119.096	3.62
November	118.531	3.65
December	117.276	3.71
Average	111.449	4.04 %

Source: Bloomberg

Kansas City Southern Corp.

46

Type:	Sr Note (New)
Description:	KCS
CUSIP:	485170BD5
Coupon Rate:	2.875%
Maturity Date:	11/15/2029
Amount Outstanding ($ 000)	$425,000
Months Outstanding	1.5

End of Month in 2019	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	100.325	2.84
December	99.659	2.92
Average	99.992	2.88 %

Source: Bloomberg

Prospectus supplement dated November 14, 2019
Interest accrues from November 18, 2019

Kansas City Southern Corp.

47

Type:	Sr Note (New)
Description:	KCS
CUSIP:	485170BC7
Coupon Rate:	4.200%
Maturity Date:	11/15/2069
Amount Outstanding ($ 000)	$425,000
Months Outstanding	1.5

End of Month in 2019	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	102.316	4.09
December	101.763	4.12
Average	102.040	4.11 %

Source: Bloomberg

Prospectus supplement dated November 14, 2019
Interest accrues from November 18, 2019

Kansas City Southern Corp.

48

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 2019	Price	Yield
January	97.460	3.65 %
February	95.996	4.05
March	98.187	3.48
April	97.948	3.55
May	98.629	3.37
June	99.599	3.11
July	99.427	3.16
August	100.689	2.80
September	100.291	2.91
October	100.450	2.87
November	100.237	2.93
December	100.499	2.84
Average	99.118	3.23 %

Source: Bloomberg

Norfolk Southern Corp.

49

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

End of Month in 2019	Price	Yield
January	145.021	4.74 %
February	141.752	4.91
March	147.325	4.61
April	144.993	4.72
May	149.957	4.46
June	152.419	4.33
July	151.083	4.39
August	160.437	3.93
September	155.279	4.17
October	152.758	4.29
November	153.883	4.23
December	150.886	4.38
Average	150.483	4.43 %

Source: Bloomberg

Norfolk Southern Corp.

50

Type:	Notes
Description:	Series A NSC
CUSIP:	655844AA6
Coupon Rate:	9.000%
Maturity Date:	3/1/2021
Amount Outstanding ($ 000)	$83,372
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	110.903	3.50 %
February	110.529	3.48
March	109.446	3.83
April	109.202	3.75
May	109.302	3.45
June	109.333	3.19
July	108.844	3.21
August	108.685	3.00
September	108.147	3.07
October	107.792	2.95
November	107.317	2.96
December	106.806	2.99
Average	108.859	3.28 %

Source: Bloomberg

Norfolk Southern Corp.

51

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 2019	Price	Yield
January	128.947	4.17 %
February	128.121	4.23
March	131.458	3.91
April	131.152	3.92
May	134.410	3.62
June	136.283	3.44
July	137.130	3.34
August	140.183	3.06
September	138.173	3.21
October	138.813	3.14
November	139.333	3.07
December	137.924	3.17
Average	135.161	3.52 %

Source: Bloomberg

Norfolk Southern Corp.

52

Type:	Notes
Description:	Senior
CUSIP:	655844BG2
Coupon Rate:	3.250%
Maturity Date:	12/1/2021
Amount Outstanding ($ 000)	$500,000
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	100.333	3.13 %
February	100.400	3.10
March	100.987	2.86
April	100.947	2.87
May	101.594	2.59
June	101.933	2.42
July	101.686	2.50
August	102.211	2.23
September	102.091	2.25
October	102.395	2.07
November	102.190	2.12
December	102.250	2.04
Average	101.585	2.52 %

Source: Bloomberg

Norfolk Southern Corp.

53

Type:	Notes
Description:	Senior
CUSIP:	655844BJ6
Coupon Rate:	3.000%
Maturity Date:	4/1/2022
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	99.735	3.09 %
February	99.740	3.09
March	100.593	2.79
April	100.516	2.81
May	101.398	2.48
June	101.913	2.28
July	101.601	2.38
August	102.355	2.06
September	102.019	2.17
October	102.125	2.09
November	102.086	2.08
December	102.068	2.05
Average	101.346	2.45 %

Source: Bloomberg

Norfolk Southern Corp.

54

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 2019	Price	Yield
January	98.887	3.20 %
February	98.878	3.21
March	100.065	2.88
April	100.297	2.82
May	100.983	2.62
June	102.101	2.29
July	102.037	2.30
August	102.917	2.02
September	102.247	2.21
October	102.420	2.14
November	102.274	2.16
December	102.378	2.11
Average	101.290	2.50 %

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.

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

Norfolk Southern Corp.

55

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 2019	Price	Yield
January	98.982	3.17 %
February	99.158	3.13
March	100.224	2.84
April	100.305	2.82
May	100.880	2.65
June	102.109	2.29
July	102.257	2.24
August	102.869	2.04
September	102.334	2.18
October	102.458	2.12
November	102.252	2.17
December	102.423	2.10
Average	101.354	2.48 %

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.

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

Norfolk Southern Corp.

56

Type:	Notes
Description:	Senior
CUSIP:	655844BD9
Coupon Rate:	6.000%
Maturity Date:	5/23/2111
Amount Outstanding ($ 000)	$121,731
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	116.042	5.16 %
February	118.520	5.05
March	125.404	4.77
April	120.440	4.97
May	122.708	4.88
June	124.875	4.79
July	127.510	4.69
August	142.039	4.20
September	133.940	4.46
October	131.885	4.53
November	134.074	4.46
December	131.252	4.55
Average	127.391	4.71 %

Source: Bloomberg

$97,602
24,129
$121,731

same CUSIP

Norfolk Southern Corp.

57

Type:	Notes
Description:	Senior 2105
CUSIP:	655844AV0
Coupon Rate:	6.000%
Maturity Date:	3/15/2105
Amount Outstanding ($ 000)	$184,118
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	114.870	5.22 %
February	113.861	5.26
March	115.824	5.17
April	115.102	5.20
May	121.138	4.94
June	123.200	4.86
July	124.849	4.79
August	139.548	4.27
September	135.161	4.41
October	135.050	4.41
November	130.620	4.57
December	128.417	4.65
Average	124.803	4.81 %

Source: Bloomberg

Traded during all months of 2017

$100,428
83,690
$184,118

same CUSIP

Norfolk Southern Corp.

58

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 2019	Price	Yield
January	113.169	4.06 %
February	112.986	4.07
March	115.724	3.76
April	115.686	3.75
May	118.527	3.43
June	120.324	3.22
July	120.691	3.17
August	123.941	2.80
September	121.746	3.02
October	121.742	3.00
November	121.611	3.00
December	120.621	3.09
Average	118.897	3.36 %

Source: Bloomberg

Norfolk Southern Corp.

59

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 2019	Price	Yield
January	111.256	3.57 %
February	111.265	3.55
March	112.710	3.28
April	112.427	3.30
May	113.417	3.10
June	114.330	2.92
July	113.951	2.95
August	116.165	2.53
September	115.040	2.69
October	115.424	2.58
November	116.049	2.43
December	115.499	2.49
Average	113.961	2.95 %

Source: Bloomberg

Norfolk Southern Corp.

60

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 2019	Price	Yield
January	106.316	4.39 %
February	105.149	4.47
March	109.284	4.20
April	109.506	4.18
May	113.322	3.93
June	115.570	3.79
July	117.190	3.69
August	124.183	3.29
September	120.809	3.48
October	120.517	3.49
November	120.462	3.49
December	118.290	3.62
Average	115.050	3.84 %

Source: Bloomberg

$595,502
2
$595,504

same CUSIP

Norfolk Southern Corp.

61

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 2019	Price	Yield
January	93.931	4.36 %
February	93.933	4.36
March	97.839	4.09
April	97.385	4.13
May	100.763	3.90
June	103.107	3.75
July	104.023	3.69
August	111.811	3.22
September	108.854	3.39
October	108.717	3.40
November	108.865	3.39
December	107.001	3.50
Average	103.019	3.77 %

Source: Bloomberg

Norfolk Southern Corp.

62

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 2019	Price	Yield
January	103.347	4.57 %
February	102.703	4.61
March	107.184	4.32
April	106.016	4.39
May	110.860	4.09
June	112.727	3.97
July	113.131	3.95
August	122.152	3.44
September	119.628	3.57
October	119.145	3.60
November	117.746	3.67
December	114.561	3.86
Average	112.433	4.00 %

Source: Bloomberg

Norfolk Southern Corp.

63

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 2019	Price	Yield
January	102.413	3.32 %
February	102.216	3.35
March	103.750	3.00
April	103.720	3.00
May	104.992	2.69
June	105.602	2.54
July	105.629	2.51
August	106.809	2.20
September	106.551	2.24
October	106.610	2.19
November	106.152	2.28
December	106.190	2.24
Average	105.053	2.63 %

Source: Bloomberg

Norfolk Southern Corp.

64

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 2019	Price	Yield
January	100.865	4.39 %
February	100.622	4.41
March	104.628	4.16
April	104.543	4.16
May	108.267	3.94
June	111.300	3.76
July	112.153	3.72
August	120.154	3.29
September	116.655	3.47
October	116.590	3.47
November	116.434	3.47
December	115.196	3.54
Average	110.617	3.82 %

Source: Bloomberg

Norfolk Southern Corp.

65

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 2019	Price	Yield
January	103.790	4.41 %
February	103.191	4.45
March	107.935	4.16
April	107.366	4.19
May	111.473	3.95
June	114.226	3.80
July	115.426	3.73
August	123.590	3.30
September	120.143	3.48
October	119.905	3.49
November	119.265	3.52
December	118.280	3.57
Average	113.716	3.84 %

Source: Bloomberg

Norfolk Southern Corp.

66

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 2019	Price	Yield
January	95.990	3.52 %
February	96.102	3.51
March	97.781	3.25
April	98.300	3.17
May	99.901	2.92
June	101.580	2.65
July	101.763	2.62
August	104.035	2.26
September	103.236	2.38
October	103.548	2.32
November	103.249	2.36
December	103.022	2.39
Average	100.709	2.78 %

Source: Bloomberg

Norfolk Southern Corp.

67

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 2019	Price	Yield
January	96.666	3.62 %
February	96.514	3.64
March	98.722	3.33
April	98.988	3.29
May	101.018	3.01
June	102.707	2.77
July	103.116	2.71
August	106.299	2.26
September	104.891	2.45
October	105.230	2.39
November	104.798	2.45
December	104.409	2.49
Average	101.947	2.87 %

Source: Bloomberg

Norfolk Southern Corp.

68

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 2019	Price	Yield
January	93.731	4.33 %
February	93.494	4.34
March	97.851	4.07
April	97.415	4.10
May	100.748	3.90
June	104.175	3.70
July	104.816	3.67
August	112.701	3.25
September	109.018	3.44
October	109.562	3.41
November	108.966	3.44
December	107.519	3.52
Average	103.333	3.76 %

Source: Bloomberg

Norfolk Southern Corp.

69

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 2019	Price	Yield
January	92.842	4.46 %
February	93.173	4.44
March	97.439	4.19
April	97.846	4.17
May	100.711	4.01
June	104.750	3.80
July	105.483	3.76
August	114.626	3.32
September	110.290	3.52
October	110.713	3.50
November	111.090	3.48
December	109.940	3.53
Average	104.075	3.85 %

Source: Bloomberg

Norfolk Southern Corp.

70

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 2019	Price	Yield
January	96.935	4.34 %
February	96.808	4.35
March	101.547	4.06
April	100.946	4.09
May	103.793	3.93
June	107.195	3.74
July	108.557	3.66
August	116.733	3.25
September	113.235	3.42
October	113.183	3.42
November	112.920	3.43
December	113.007	3.43
Average	107.072	3.76 %

Source: Bloomberg

Norfolk Southern Corp.

71

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 2019	Price	Yield
January	101.344	3.42 %
February	101.302	3.42
March	103.191	3.09
April	103.087	3.10
May	104.458	2.86
June	105.721	2.63
July	105.937	2.58
August	108.014	2.20
September	107.203	2.32
October	107.598	2.23
November	106.947	2.33
December	106.823	2.34
Average	105.135	2.71 %

Source: Bloomberg

Norfolk Southern Corp.

72

Type:	Notes (New)
Description:	Senior
CUSIP:	655844CC0
Coupon Rate:	4.100%
Maturity Date:	5/15/2049
Amount Outstanding ($ 000)	$400,000
Months Outstanding	7.5

End of Month in 2019	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	102.827	3.94
June	106.546	3.73
July	107.512	3.68
August	115.442	3.28
September	112.512	3.42
October	112.168	3.44
November	112.715	3.41
December	110.917	3.50
Average	110.080	3.55 %

Source: Bloomberg

Prospectus supplement dated April 29, 2019
Interest accrues from May 8, 2019

Norfolk Southern Corp.

73

Type:	Notes
Description:	Senior
CUSIP:	655844BZ0
Coupon Rate:	3.800%
Maturity Date:	8/1/2028
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	101.377	3.63 %
February	100.759	3.70
March	103.310	3.38
April	103.531	3.35
May	105.647	3.09
June	107.678	2.84
July	107.951	2.79
August	112.136	2.29
September	110.564	2.46
October	110.860	2.41
November	110.157	2.49
December	109.751	2.53
Average	106.977	2.91 %

Source: Bloomberg

Norfolk Southern Corp.

74

Type:	Notes (New)
Description:	Senior
CUSIP:	655844BZ0
Coupon Rate:	3.800%
Maturity Date:	8/1/2028
Amount Outstanding ($ 000)	$200,000
Months Outstanding	7.5

End of Month in 2019	Price	Yield
January	*	* %
February	↓	↓
March		
April		
May	105.647	3.09
June	107.678	2.84
July	107.951	2.79
August	112.136	2.29
September	110.564	2.46
October	110.860	2.41
November	110.157	2.49
December	109.751	2.53
Average	109.343	2.61 %

Source: Bloomberg

Prospectus supplement dated April 29, 2019
Interest accrues from February 1, 2019

* A portion of this set of notes (ID = 73) was offered earlier and traded in 2018. This portion (ID = 74) was offered later, and traded

Norfolk Southern Corp.

75

Type:	Notes
Description:	Senior
CUSIP:	655844CB2
Coupon Rate:	5.100%
Maturity Date:	8/1/2118
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	98.953	5.15 %
February	99.475	5.13
March	105.342	4.84
April	104.838	4.86
May	109.529	4.65
June	113.608	4.48
July	116.327	4.38
August	128.279	3.96
September	121.858	4.17
October	120.533	4.22
November	121.059	4.20
December	118.628	4.29
Average	113.202	4.53 %

Source: Bloomberg

Norfolk Southern Corp.

76

Type:	Notes (New)
Description:	Senior
CUSIP:	655844CB2
Coupon Rate:	5.100%
Maturity Date:	8/1/2118
Amount Outstanding ($ 000)	$200,000
Months Outstanding	7.5

End of Month in 2019	Price	Yield
January	*	* %
February	↓	↓
March		
April		
May	109.529	4.65
June	113.608	4.48
July	116.327	4.38
August	128.279	3.96
September	121.858	4.17
October	120.533	4.22
November	121.059	4.20
December	118.628	4.29
Average	118.728	4.29 %

Source: Bloomberg

Prospectus supplement dated April 29, 2019
Interest accrues from February 1, 2019

* A portion of this set of notes (ID = 75) was offered earlier and traded in 2018. This portion (ID = 76) was offered later, and traded

Norfolk Southern Corp.

77

Type:	Notes (New)
Description:	Senior
CUSIP:	655844CE6
Coupon Rate:	2.550%
Maturity Date:	11/1/2029
Amount Outstanding ($ 000)	$400,000
Months Outstanding	2.0

End of Month in 2019	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	100.453	2.50
November	99.706	2.58
December	99.474	2.61
Average	99.878	2.56 %

Source: Bloomberg

Prospectus supplement dated October 24, 2019
Interest accrues from November 4, 2019

Norfolk Southern Corp.

78

Type:	Notes (New)
Description:	Senior
CUSIP:	655844CD8
Coupon Rate:	3.400%
Maturity Date:	11/1/2049
Amount Outstanding ($ 000)	$400,000
Months Outstanding	2.0

End of Month in 2019	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	100.435	3.38
November	100.288	3.39
December	99.137	3.45
Average	99.953	3.41 %

Source: Bloomberg

Prospectus supplement dated October 24, 2019
Interest accrues from November 4, 2019

Norfolk Southern Corp.

79

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 2019	Price	Yield
January	126.539	4.00 %
February	126.363	4.00
March	129.597	3.57
April	129.647	3.53
May	131.906	3.22
June	133.080	3.04
July	133.471	2.96
August	135.948	2.61
September	134.375	2.77
October	134.172	2.75
November	134.689	2.64
December	133.792	2.71
Average	131.965	3.15 %

Source: Bloomberg

Norfolk Southern Corp.

80

Type:	Conrail Notes
Description:	CR NSC 2037
CUSIP:	655844AF5
Coupon Rate:	7.050%
Maturity Date:	5/1/2037
Amount Outstanding ($ 000)	$178,995
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	133.195	4.39 %
February	132.529	4.42
March	137.248	4.11
April	134.112	4.31
May	138.674	4.00
June	140.701	3.87
July	140.638	3.86
August	149.754	3.31
September	144.970	3.58
October	144.130	3.62
November	143.172	3.67
December	140.197	3.85
Average	139.943	3.92 %

Source: Bloomberg

Norfolk Southern Corp.

81

Type:	Conrail Notes
Description:	CR NSC 2097
CUSIP:	655844AK4
Coupon Rate:	7.900%
Maturity Date:	5/15/2097
Amount Outstanding ($ 000)	$225,222
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	148.177	5.30 %
February	146.920	5.35
March	155.432	5.05
April	154.337	5.08
May	161.969	4.83
June	164.870	4.74
July	167.122	4.67
August	181.373	4.28
September	175.992	4.42
October	175.870	4.43
November	177.043	4.39
December	166.258	4.70
Average	164.614	4.77 %

Source: Bloomberg

Union Pacific Corp.

82

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CS5
Coupon Rate:	5.375%
Maturity Date:	6/1/2033
Amount Outstanding ($ 000)	$147,996
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	113.816	4.09 %
February	112.677	4.18
March	116.502	3.85
April	116.866	3.82
May	118.651	3.66
June	120.702	3.48
July	121.092	3.45
August	126.958	2.97
September	124.271	3.17
October	125.880	3.04
November	125.169	3.08
December	122.393	3.30
Average	120.415	3.51 %

Source: Bloomberg

Union Pacific Corp.

83

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CX4
Coupon Rate:	6.150%
Maturity Date:	5/1/2037
Amount Outstanding ($ 000)	$99,098
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	123.530	4.28 %
February	124.032	4.24
March	125.915	4.11
April	126.046	4.09
May	129.966	3.82
June	131.091	3.74
July	131.607	3.70
August	139.225	3.22
September	136.223	3.40
October	138.207	3.27
November	136.839	3.34
December	133.685	3.53
Average	131.364	3.73 %

Source: Bloomberg

Union Pacific Corp.

84

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CU0
Coupon Rate:	6.250%
Maturity Date:	5/1/2034
Amount Outstanding ($ 000)	$157,317
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	120.561	4.39 %
February	121.024	4.34
March	123.460	4.14
April	123.452	4.14
May	126.687	3.88
June	127.975	3.77
July	128.449	3.73
August	134.914	3.24
September	132.489	3.40
October	135.306	3.19
November	133.993	3.27
December	132.234	3.39
Average	128.379	3.74 %

Source: Bloomberg

Union Pacific Corp.

85

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CF3
Coupon Rate:	6.625%
Maturity Date:	2/1/2029
Amount Outstanding ($ 000)	$394,083
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	123.153	3.82 %
February	121.871	3.94
March	124.812	3.60
April	124.664	3.60
May	126.792	3.35
June	128.320	3.17
July	128.981	3.08
August	133.114	2.63
September	131.065	2.82
October	131.189	2.78
November	130.370	2.84
December	129.424	2.91
Average	127.813	3.21 %

Source: Bloomberg

Union Pacific Corp.

86

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818BY3
Coupon Rate:	7.125%
Maturity Date:	2/1/2028
Amount Outstanding ($ 000)	$173,770
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	123.471	3.99 %
February	124.008	3.91
March	126.840	3.56
April	127.033	3.51
May	129.195	3.23
June	129.941	3.12
July	129.732	3.12
August	133.296	2.68
September	131.851	2.81
October	132.559	2.69
November	131.975	2.73
December	131.084	2.80
Average	129.249	3.18 %

Source: Bloomberg

Union Pacific Corp.

87

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DN5
Coupon Rate:	2.750%
Maturity Date:	4/15/2023
Amount Outstanding ($ 000)	$323,407
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	98.731	3.07 %
February	98.569	3.12
March	99.632	2.85
April	99.478	2.89
May	100.618	2.58
June	101.373	2.37
July	101.212	2.41
August	102.507	2.03
September	102.025	2.15
October	102.117	2.11
November	101.943	2.15
December	101.937	2.14
Average	100.845	2.49 %

Source: Bloomberg

Union Pacific Corp.

88

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EH7
Coupon Rate:	2.750%
Maturity Date:	3/1/2026
Amount Outstanding ($ 000)	$647,668
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	95.432	3.48 %
February	95.449	3.49
March	97.620	3.14
April	97.908	3.09
May	98.944	2.92
June	100.846	2.61
July	100.603	2.65
August	103.213	2.22
September	101.696	2.46
October	102.663	2.30
November	102.819	2.26
December	102.128	2.38
Average	99.943	2.75 %

Source: Bloomberg

Union Pacific Corp.

89

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818EZ7
Coupon Rate:	2.950%
Maturity Date:	3/1/2022
Amount Outstanding ($ 000)	$498,105
Months Outstanding	10.5

End of Month in 2019	Price	Yield
January	Not Traded	- %
February	100.036	2.94
March	100.813	2.66
April	100.628	2.72
May	101.282	2.46
June	101.871	2.22
July	101.602	2.31
August	102.528	1.91
September	102.261	1.99
October	102.323	1.92
November	102.065	2.00
December	102.136	1.94
Average	101.595	2.28 %

Source: Bloomberg

Prospectus supplement dated February 11, 2019
Interest accrues from February 19, 2019

Union Pacific Corp.

90

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DM7
Coupon Rate:	2.950%
Maturity Date:	1/15/2023
Amount Outstanding ($ 000)	$299,220
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	99.544	3.07 %
February	99.340	3.13
March	100.260	2.88
April	100.335	2.85
May	101.098	2.63
June	101.585	2.48
July	101.778	2.41
August	102.873	2.06
September	102.300	2.22
October	102.714	2.07
November	102.271	2.19
December	102.304	2.16
Average	101.367	2.51 %

Source: Bloomberg

Union Pacific Corp.

91

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EP9
Coupon Rate:	3.000%
Maturity Date:	4/15/2027
Amount Outstanding ($ 000)	$491,782
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	96.230	3.53 %
February	95.982	3.58
March	98.333	3.24
April	98.534	3.21
May	99.951	3.01
June	101.944	2.72
July	102.133	2.69
August	104.985	2.28
September	104.279	2.38
October	105.602	2.18
November	105.560	2.18
December	104.816	2.28
Average	101.529	2.77 %

Source: Bloomberg

Union Pacific Corp.

92

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FA1
Coupon Rate:	3.150%
Maturity Date:	3/1/2024
Amount Outstanding ($ 000)	$496,586
Months Outstanding	10.5

End of Month in 2019	Price	Yield
January	Not Traded	- %
February	99.844	3.18
March	101.356	2.85
April	101.296	2.86
May	102.201	2.65
June	103.102	2.44
July	102.862	2.49
August	104.603	2.07
September	103.901	2.22
October	104.542	2.05
November	103.998	2.16
December	104.017	2.14
Average	102.884	2.46 %

Source: Bloomberg

Prospectus supplement dated February 11, 2019
Interest accrues from February 19, 2019

Union Pacific Corp.

93

Type:	Notes
Description:	UP Corp.
CUSIP:	907818ET1
Coupon Rate:	3.200%
Maturity Date:	6/8/2021
Amount Outstanding ($ 000)	$598,380
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	100.947	2.78 %
February	100.654	2.90
March	101.174	2.64
April	101.046	2.68
May	101.486	2.44
June	101.782	2.25
July	101.745	2.23
August	102.099	1.98
September	101.954	2.01
October	102.020	1.91
November	101.940	1.89
December	101.932	1.83
Average	101.565	2.30 %

Source: Bloomberg

Union Pacific Corp.

94

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DY1
Coupon Rate:	3.250%
Maturity Date:	1/15/2025
Amount Outstanding ($ 000)	$348,025
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	98.930	3.45 %
February	99.343	3.37
March	101.123	3.04
April	101.246	3.01
May	102.325	2.80
June	103.744	2.52
July	103.498	2.56
August	105.257	2.21
September	104.712	2.30
October	105.022	2.22
November	104.467	2.32
December	104.484	2.30
Average	102.846	2.68 %

Source: Bloomberg

Union Pacific Corp.

95

Type:	Notes
Description:	UP Corp.
CUSIP:	907818ED6
Coupon Rate:	3.250%
Maturity Date:	8/15/2025
Amount Outstanding ($ 000)	$499,071
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	99.647	3.31 %
February	99.448	3.35
March	101.366	3.01
April	101.425	3.00
May	102.635	2.78
June	104.078	2.53
July	103.812	2.56
August	105.788	2.21
September	104.868	2.36
October	105.512	2.23
November	105.035	2.30
December	105.781	2.15
Average	103.283	2.65 %

Source: Bloomberg

Union Pacific Corp.

96

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EK0
Coupon Rate:	3.350%
Maturity Date:	8/15/2046
Amount Outstanding ($ 000)	$296,110
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	84.511	4.32 %
February	83.484	4.39
March	87.944	4.09
April	88.452	4.05
May	90.414	3.93
June	94.726	3.66
July	94.650	3.66
August	102.686	3.20
September	98.633	3.43
October	99.329	3.39
November	99.114	3.40
December	98.276	3.45
Average	93.518	3.75 %

Source: Bloomberg

Union Pacific Corp.

97

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EB0
Coupon Rate:	3.375%
Maturity Date:	2/1/2035
Amount Outstanding ($ 000)	$445,262
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	90.321	4.21 %
February	89.974	4.25
March	93.753	3.91
April	94.592	3.84
May	96.767	3.65
June	98.953	3.46
July	99.877	3.39
August	105.657	2.92
September	103.949	3.05
October	103.358	3.10
November	103.149	3.11
December	103.605	3.07
Average	98.663	3.50 %

Source: Bloomberg

Union Pacific Corp.

98

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EU8
Coupon Rate:	3.500%
Maturity Date:	6/8/2023
Amount Outstanding ($ 000)	$646,230
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	101.395	3.15 %
February	101.510	3.12
March	102.507	2.86
April	102.610	2.82
May	103.422	2.60
June	104.082	2.41
July	104.004	2.40
August	105.291	2.03
September	104.715	2.16
October	104.911	2.08
November	104.646	2.12
December	104.796	2.05
Average	103.657	2.48 %

Source: Bloomberg

Union Pacific Corp.

99

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FD5
Coupon Rate:	3.550%
Maturity Date:	8/15/2039
Amount Outstanding ($ 000)	$493,635
Months Outstanding	5.0

End of Month in 2019	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	Not Traded	-
July	100.940	3.48
August	107.539	3.04
September	105.291	3.19
October	105.554	3.17
November	104.559	3.24
December	103.805	3.29
Average	104.615	3.24 %

Source: Bloomberg

Prospectus supplement dated July 29, 2019
Interest accrues from August 5, 2019

Union Pacific Corp.

100

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EQ7
Coupon Rate:	3.600%
Maturity Date:	9/15/2037
Amount Outstanding ($ 000)	$494,956
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	91.664	4.25 %
February	91.119	4.30
March	95.208	3.97
April	95.831	3.92
May	98.013	3.75
June	100.973	3.53
July	102.108	3.44
August	108.006	3.02
September	105.992	3.16
October	105.381	3.20
November	104.929	3.23
December	104.114	3.29
Average	100.278	3.59 %

Source: Bloomberg

Union Pacific Corp.

101

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DR6
Coupon Rate:	3.646%
Maturity Date:	2/15/2024
Amount Outstanding ($ 000)	$394,171
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	101.882	3.24 %
February	102.115	3.18
March	103.249	2.93
April	103.514	2.86
May	104.191	2.69
June	104.940	2.51
July	104.735	2.53
August	106.620	2.08
September	105.705	2.27
October	105.916	2.19
November	105.607	2.24
December	105.518	2.24
Average	104.499	2.58 %

Source: Bloomberg

Union Pacific Corp.

102

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FB9
Coupon Rate:	3.700%
Maturity Date:	3/1/2029
Amount Outstanding ($ 000)	$992,374
Months Outstanding	10.5

End of Month in 2019	Price	Yield
January	Not Traded	- %
February	99.558	3.75
March	102.790	3.37
April	102.851	3.36
May	104.670	3.14
June	107.457	2.81
July	107.578	2.79
August	111.257	2.37
September	108.952	2.62
October	109.507	2.55
November	109.022	2.60
December	108.897	2.60
Average	106.594	2.91 %

Source: Bloomberg

Prospectus supplement dated February 11, 2019
Interest accrues from February 19, 2019

Union Pacific Corp.

103

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DV7
Coupon Rate:	3.750%
Maturity Date:	3/15/2024
Amount Outstanding ($ 000)	$397,186
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	102.128	3.29 %
February	102.074	3.30
March	103.684	2.95
April	103.741	2.92
May	104.909	2.65
June	105.533	2.50
July	105.229	2.54
August	106.554	2.22
September	105.962	2.33
October	106.341	2.22
November	105.998	2.27
December	105.811	2.29
Average	104.830	2.62 %

Source: Bloomberg

Union Pacific Corp.

104

Type:	Notes
Description:	UP Corp.
CUSIP:	907818ES3
Coupon Rate:	3.750%
Maturity Date:	7/15/2025
Amount Outstanding ($ 000)	$496,968
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	102.305	3.35 %
February	102.212	3.36
March	104.069	3.03
April	104.218	3.00
May	105.286	2.80
June	106.542	2.57
July	106.611	2.55
August	108.286	2.23
September	107.745	2.31
October	108.285	2.20
November	107.439	2.33
December	107.145	2.37
Average	105.845	2.68 %

Source: Bloomberg

Union Pacific Corp.

105

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EM6
Coupon Rate:	3.799%
Maturity Date:	10/1/2051
Amount Outstanding ($ 000)	$699,778
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	88.348	4.48 %
February	88.869	4.45
March	93.984	4.14
April	94.317	4.12
May	95.124	4.07
June	100.889	3.75
July	101.865	3.70
August	109.889	3.30
September	106.866	3.44
October	107.522	3.41
November	107.934	3.39
December	106.284	3.47
Average	100.158	3.81 %

Source: Bloomberg

Union Pacific Corp.

106

Type:	Notes (New)
Description:	UP Corp. 144A
CUSIP:	907818FF0
Coupon Rate:	3.839%
Maturity Date:	3/20/2060
Amount Outstanding ($ 000)	$1,405,612
Months Outstanding	1.5

End of Month in 2019	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	102.803	3.71
December	102.334	3.73
Average	102.569	3.72 %

Source: Bloomberg

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

Union Pacific Corp.

107

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EC8
Coupon Rate:	3.875%
Maturity Date:	2/1/2055
Amount Outstanding ($ 000)	$443,990
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	88.284	4.54 %
February	87.184	4.61
March	92.868	4.27
April	93.165	4.25
May	95.249	4.13
June	99.077	3.92
July	99.551	3.90
August	108.970	3.44
September	105.534	3.60
October	106.065	3.57
November	104.501	3.65
December	104.303	3.66
Average	98.729	3.96 %

Source: Bloomberg

Union Pacific Corp.

108

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EY0
Coupon Rate:	3.950%
Maturity Date:	9/10/2028
Amount Outstanding ($ 000)	$1,486,816
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	102.331	3.66 %
February	102.246	3.67
March	104.943	3.34
April	105.209	3.30
May	106.743	3.11
June	109.379	2.79
July	109.278	2.79
August	112.620	2.39
September	110.585	2.61
October	110.921	2.56
November	110.649	2.59
December	110.423	2.60
Average	107.944	2.95 %

Source: Bloomberg

Union Pacific Corp.

109

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FE3
Coupon Rate:	3.950%
Maturity Date:	8/15/2059
Amount Outstanding ($ 000)	$491,023
Months Outstanding	5.0

End of Month in 2019	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	Not Traded	-
July	100.822	3.91
August	111.091	3.44
September	106.838	3.62
October	106.129	3.66
November	105.507	3.69
December	104.867	3.71
Average	105.876	3.67 %

Source: Bloomberg

Prospectus supplement dated July 29, 2019
Interest accrues from August 5, 2019

Union Pacific Corp.

110

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DG0
Coupon Rate:	4.000%
Maturity Date:	2/1/2021
Amount Outstanding ($ 000)	$499,199
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	102.044	2.94 %
February	101.817	3.01
March	102.181	2.77
April	102.042	2.79
May	102.340	2.55
June	102.488	2.39
July	102.199	2.49
August	102.399	2.26
September	102.257	2.27
October	102.135	2.25
November	101.922	2.31
December	101.869	2.23
Average	102.141	2.52 %

Source: Bloomberg

Union Pacific Corp.

111

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EN4
Coupon Rate:	4.000%
Maturity Date:	4/15/2047
Amount Outstanding ($ 000)	$488,862
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	95.217	4.29 %
February	93.668	4.39
March	98.650	4.08
April	98.779	4.07
May	100.938	3.94
June	104.930	3.71
July	105.826	3.66
August	113.837	3.24
September	111.405	3.36
October	111.071	3.38
November	110.492	3.41
December	108.914	3.49
Average	104.477	3.75 %

Source: Bloomberg

Union Pacific Corp.

112

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EF1
Coupon Rate:	4.050%
Maturity Date:	11/15/2045
Amount Outstanding ($ 000)	$489,908
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	94.424	4.41 %
February	93.428	4.47
March	97.988	4.18
April	98.391	4.15
May	100.738	4.00
June	104.548	3.78
July	105.145	3.74
August	113.599	3.27
September	110.886	3.42
October	110.336	3.45
November	109.534	3.49
December	108.812	3.53
Average	103.986	3.82 %

Source: Bloomberg

Union Pacific Corp.

113

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EJ3
Coupon Rate:	4.050%
Maturity Date:	3/1/2046
Amount Outstanding ($ 000)	$587,103
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	94.871	4.38 %
February	94.102	4.43
March	98.418	4.15
April	98.648	4.13
May	101.277	3.97
June	104.779	3.76
July	105.114	3.74
August	113.331	3.29
September	110.611	3.44
October	110.598	3.44
November	110.184	3.46
December	109.772	3.48
Average	104.309	3.81 %

Source: Bloomberg

Union Pacific Corp.

114

Type:	Notes
Description:	UP Corp.
CUSIP:	907818ER5
Coupon Rate:	4.100%
Maturity Date:	9/15/2067
Amount Outstanding ($ 000)	$494,352
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	87.320	4.77 %
February	86.455	4.83
March	92.620	4.47
April	92.915	4.46
May	96.322	4.28
June	100.100	4.10
July	100.549	4.07
August	109.311	3.69
September	105.971	3.83
October	104.218	3.90
November	104.049	3.91
December	103.167	3.95
Average	98.583	4.19 %

Source: Bloomberg

Union Pacific Corp.

115

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DZ8
Coupon Rate:	4.150%
Maturity Date:	1/15/2045
Amount Outstanding ($ 000)	$342,133
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	95.698	4.43 %
February	95.817	4.42
March	99.205	4.20
April	99.514	4.18
May	101.743	4.04
June	105.689	3.80
July	106.339	3.76
August	113.369	3.36
September	110.838	3.50
October	111.739	3.45
November	110.772	3.50
December	109.139	3.59
Average	104.989	3.85 %

Source: Bloomberg

Union Pacific Corp.

116

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DK1
Coupon Rate:	4.163%
Maturity Date:	7/15/2022
Amount Outstanding ($ 000)	$699,609
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	103.351	3.13 %
February	103.943	2.92
March	104.395	2.75
April	103.915	2.87
May	104.598	2.62
June	105.111	2.41
July	104.840	2.45
August	105.497	2.17
September	105.264	2.20
October	105.461	2.07
November	105.177	2.12
December	105.242	2.03
Average	104.733	2.48 %

Source: Bloomberg

Union Pacific Corp.

117

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DP0
Coupon Rate:	4.250%
Maturity Date:	4/15/2043
Amount Outstanding ($ 000)	$318,271
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	97.131	4.44 %
February	96.315	4.50
March	101.108	4.18
April	101.671	4.14
May	105.478	3.90
June	105.497	3.89
July	107.512	3.77
August	114.741	3.34
September	112.741	3.46
October	112.509	3.47
November	111.674	3.51
December	111.379	3.53
Average	106.480	3.84 %

Source: Bloomberg

Union Pacific Corp.

118

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DL9
Coupon Rate:	4.300%
Maturity Date:	6/15/2042
Amount Outstanding ($ 000)	$297,200
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	98.244	4.42 %
February	98.291	4.42
March	101.738	4.18
April	101.897	4.17
May	105.825	3.91
June	106.595	3.86
July	107.337	3.82
August	115.487	3.33
September	113.481	3.44
October	115.415	3.33
November	112.422	3.50
December	112.184	3.51
Average	107.410	3.82 %

Source: Bloomberg

Union Pacific Corp.

119

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FC7
Coupon Rate:	4.300%
Maturity Date:	3/1/2049
Amount Outstanding ($ 000)	$983,173
Months Outstanding	10.5

End of Month in 2019	Price	Yield
January	Not Traded	- %
February	98.131	4.41
March	103.354	4.10
April	103.599	4.09
May	105.963	3.96
June	110.674	3.70
July	111.021	3.69
August	119.638	3.26
September	116.518	3.41
October	116.808	3.39
November	115.899	3.43
December	115.656	3.45
Average	110.660	3.72 %

Source: Bloomberg

Prospectus supplement dated February 11, 2019
Interest accrues from February 19, 2019

Union Pacific Corp.

120

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EV6
Coupon Rate:	4.375%
Maturity Date:	9/10/2038
Amount Outstanding ($ 000)	$741,792
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	101.665	4.25 %
February	99.989	4.38
March	104.440	4.04
April	105.108	3.99
May	107.065	3.85
June	110.239	3.63
July	111.710	3.53
August	118.287	3.10
September	116.191	3.23
October	115.994	3.24
November	115.171	3.29
December	114.128	3.35
Average	109.999	3.66 %

Source: Bloomberg

Union Pacific Corp.

121

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EG9
Coupon Rate:	4.375%
Maturity Date:	11/15/2065
Amount Outstanding ($ 000)	$569,283
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	92.016	4.81 %
February	92.105	4.80
March	96.947	4.53
April	97.991	4.48
May	101.103	4.32
June	103.711	4.19
July	104.873	4.14
August	115.473	3.68
September	111.498	3.84
October	109.578	3.92
November	109.955	3.91
December	110.117	3.90
Average	103.781	4.21 %

Source: Bloomberg

Union Pacific Corp.

122

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EW4
Coupon Rate:	4.500%
Maturity Date:	9/10/2048
Amount Outstanding ($ 000)	$526,459
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	102.269	4.36 %
February	100.783	4.45
March	106.379	4.12
April	106.490	4.12
May	108.583	4.00
June	113.683	3.73
July	113.918	3.71
August	122.542	3.29
September	119.232	3.45
October	120.722	3.37
November	120.006	3.40
December	117.609	3.52
Average	112.685	3.79 %

Source: Bloomberg

Union Pacific Corp.

123

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DJ4
Coupon Rate:	4.750%
Maturity Date:	9/15/2041
Amount Outstanding ($ 000)	$231,446
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	103.846	4.48 %
February	103.419	4.51
March	107.573	4.22
April	107.157	4.25
May	111.561	3.96
June	112.598	3.90
July	113.973	3.81
August	122.055	3.33
September	118.735	3.52
October	122.035	3.32
November	119.261	3.48
December	118.614	3.52
Average	113.402	3.86 %

Source: Bloomberg

Union Pacific Corp.

124

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DU9
Coupon Rate:	4.750%
Maturity Date:	12/15/2043
Amount Outstanding ($ 000)	$187,785
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	103.751	4.50 %
February	104.092	4.48
March	105.572	4.38
April	107.119	4.28
May	109.276	4.14
June	111.774	3.99
July	113.932	3.86
August	120.778	3.48
September	117.739	3.64
October	122.778	3.36
November	121.501	3.43
December	118.267	3.61
Average	113.048	3.93 %

Source: Bloomberg

Union Pacific Corp.

125

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EX2
Coupon Rate:	4.800%
Maturity Date:	9/10/2058
Amount Outstanding ($ 000)	$75,731
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	103.574	4.60 %
February	102.538	4.66
March	108.626	4.34
April	108.721	4.34
May	112.062	4.17
June	116.826	3.95
July	116.607	3.96
August	126.715	3.53
September	122.520	3.70
October	123.515	3.66
November	121.696	3.74
December	119.160	3.84
Average	115.213	4.04 %

Source: Bloomberg

Union Pacific Corp.

126

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DT2
Coupon Rate:	4.821%
Maturity Date:	2/1/2044
Amount Outstanding ($ 000)	$136,354
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	105.759	4.44 %
February	104.033	4.55
March	108.965	4.23
April	109.009	4.23
May	111.307	4.09
June	115.861	3.82
July	116.019	3.81
August	123.385	3.40
September	120.308	3.57
October	124.220	3.35
November	122.505	3.44
December	120.918	3.53
Average	115.191	3.87 %

Source: Bloomberg

Union Pacific Corp.

127

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DX3
Coupon Rate:	4.850%
Maturity Date:	6/15/2044
Amount Outstanding ($ 000)	$83,250
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	105.687	4.47 %
February	105.793	4.47
March	109.299	4.25
April	108.329	4.30
May	110.397	4.18
June	110.813	4.15
July	114.315	3.94
August	120.608	3.59
September	117.378	3.76
October	120.440	3.59
November	121.410	3.54
December	117.633	3.74
Average	113.509	4.00 %

Source: Bloomberg

Union Pacific Corp.

128

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DF2
Coupon Rate:	5.780%
Maturity Date:	7/15/2040
Amount Outstanding ($ 000)	$63,067
Months Outstanding	12.0

End of Month in 2019	Price	Yield
January	119.343	4.38 %
February	119.506	4.37
March	119.353	4.37
April	119.792	4.34
May	123.846	4.08
June	124.901	4.02
July	125.356	3.98
August	135.618	3.39
September	132.332	3.56
October	134.419	3.44
November	132.950	3.52
December	131.117	3.62
Average	126.544	3.92 %

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.

128	$63,067
129	10
	$63,077

Union Pacific Corp.

129

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 2019	Price	Yield
January	117.844	4.48 %
February	122.057	4.21
March	120.635	4.29
April	120.652	4.29
May	124.020	4.07
June	127.067	3.89
July	127.271	3.87
August	135.211	3.41
September	132.392	3.56
October	131.221	3.62
November	130.833	3.64
December	130.021	3.68
Average	126.602	3.92 %

Source: Bloomberg

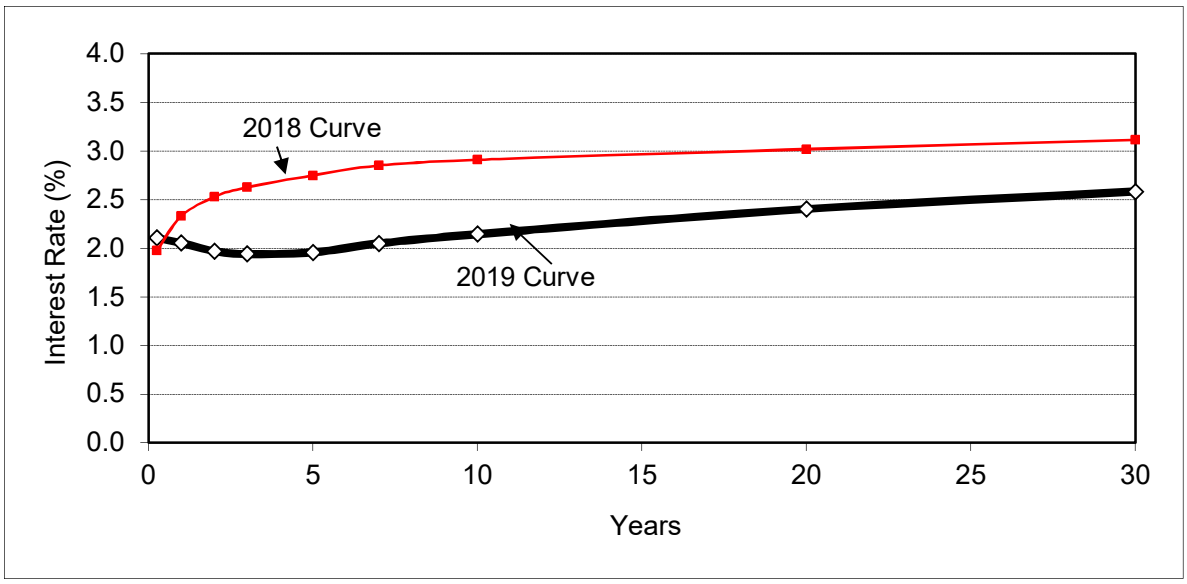
Note: These are Rule 144-A notes, which trade among qualified institutional buyers and have their own CUSIP. The exchange-traded notes similar to these are on the proceeding page.

128	$63,067
129	10
	$63,077

Interest Rates on Selected Government Instruments

Yield in Percent Per Annum, Constant Maturity Rates for 2019

	3 Mo.	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
January	2.42	2.58	2.54	2.52	2.54	2.61	2.71	2.89	3.04
February	2.44	2.55	2.50	2.48	2.49	2.57	2.68	2.87	3.02
March	2.45	2.49	2.41	2.37	2.37	2.47	2.57	2.80	2.98
April	2.43	2.42	2.34	2.31	2.33	2.43	2.53	2.76	2.94
May	2.40	2.34	2.21	2.16	2.19	2.29	2.40	2.63	2.82
June	2.22	2.00	1.81	1.78	1.83	1.95	2.07	2.36	2.57
July	2.15	1.96	1.84	1.80	1.83	1.93	2.06	2.36	2.57
August	1.99	1.77	1.57	1.51	1.49	1.55	1.63	1.91	2.12
September	1.93	1.80	1.65	1.59	1.57	1.64	1.70	1.97	2.16
October	1.68	1.61	1.55	1.53	1.53	1.62	1.71	2.00	2.19
November	1.57	1.57	1.61	1.61	1.64	1.74	1.81	2.13	2.28
December	1.57	1.55	1.61	1.63	1.68	1.79	1.86	2.16	2.30
Average	**2.10**	**2.05**	**1.97**	**1.94**	**1.96**	**2.05**	**2.14**	**2.40**	**2.58**



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

Equipment Trust Certificates for CSX

Modeled ETCs

			Balance For 2019 ($000)			Current Valuation		Current	
	ETC ID	Maturity	Beg.	Ending	Avg O/S	Interest Rate	Valuation Factor	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

			Balance For 2019 ($000)	
	ETC ID	Maturity	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 2019 ($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 2019 ($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

			Balance For 2019 ($000)			Current Valuation		Current	
	ETC ID	Maturity	Beg.	Ending	Avg O/S	Interest Rate	Valuation Factor	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

			Balance For 2019 ($000)	
	ETC ID	Maturity	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 2019 ($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 2019 ($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 2019 ($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 2019 ($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 2019 ($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 2019 ($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 2019 ($000) Beg.	Ending	Avg O/S	Current Valuation Interest Rate	Valuation Factor	Current Market Value	Interest
1.	ETC UPC Series J	1/2/2031	37,900	29,489	33,695	2.876%	1.20396	40,567	1,167
2.	ETC UPC Series A	5/14/2026	428,958	412,088	420,523	2.758%	1.02021	429,023	11,832
3.	ETC UPC Series 2015 A	5/12/2027	355,389	341,971	348,680	2.784%	0.99683	347,573	9,675
4.	ETC UPC Series 2016 A	11/9/2029	139,318	134,211	136,765	2.834%	0.98289	134,424	3,809
5.					--			--	--
6.					--			--	--
7.					--			--	--
8.					--			--	--
9.					--			--	--
10.					--			--	--
11.					--			--	--
12.					--			--	--
13.					--			--	--
14.					--			--	--
15.					--			--	--
	Total		$961,565	$917,759	$939,662	**2.783%**		**$951,588**	$26,483

Non-Modeled ETCs

	ETC ID	Maturity	Balance For 2019 ($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 2019 ($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 2019 ($000) Ending
Total Modeled	$917,759
Total Non-Modeled	0
Sub Total	917,759
Total All Current	0
Grand Total	$917,759
From UP:	
Total ETCs	$917,759
Difference	$0

2019 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	$53,260,353	$324,520	$53,584,873	98.26%	98.35%
Equipment Trust Certificates	951,588		951,588	1.74%	1.75%
Conditional Sales Agreements	0		0	0.00%	0.00%
Sub Total	$54,211,941	$324,520	$54,536,460	100.00%	100.10%
All Other — Capital Leases		$620,288	$620,288	-1186.90%	1.14%
All Other — Misc. Debt		-672,549	-672,549	1286.90%	-1.23%
All Other — Non-Modeled ETC		0	0	0.00%	0.00%
All Other — Non-Modeled CSA		0	0	0.00%	0.00%
Sub Total			-$52,261	100.00%	-0.10%
Total Market Value			**$54,484,199**		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 99.39 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 -$52,261 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 -$52,261 thousand, or -0.1 percent of total debt.

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

2019 Flotation Costs for Bonds

	UNP Sr Notes	UNP Sr Notes	UNP Sr Notes	UNP Sr Notes	CSX Notes*	CSX Notes
From 424(b)	**2/11/2019**	**2/11/2019**	**2/11/2019**	**2/11/2019**	**2/21/2019**	**2/21/2019**
Face Amount	$500,000,000	$500,000,000	$1,000,000,000	$1,000,000,000	$600,000,000	$400,000,000
Coupon Rate	2.950%	3.150%	3.700%	4.300%	4.250%	4.500%
Maturity Date	3/1/2022	3/1/2024	3/1/2029	3/1/2049	3/15/2029	3/15/2049
Frequency of Coupon Payment	2	2	2	2	2	2
Interest Accrual Date	2/19/2019	2/19/2019	2/19/2019	2/19/2019	11/15/2018	2/28/2019
Price To Investors	99.956	99.916	99.957	99.297	102.904	99.655
Proceeds from Sale (before expenses)	$499,780,000	$499,580,000	$999,570,000	$992,970,000	$617,424,000	$398,620,000
Underwriter Fee as % of Gross Proceeds	0.350%	0.600%	0.650%	0.875%	0.650%	0.875%
Underwriter's Fee	$1,750,000	$3,000,000	$6,500,000	$8,750,000	$3,900,000	$3,500,000
Railroad Expenses Excluding Fee	$12,500.00	$12,500.00	$25,000.00	$25,000.00	$180,000.00	$120,000.00
Page in 424(b) for Expenses	S-11	S-11	S-11	S-11	S-22	S-22
Calculated						
Yield Based on Price to Investors	2.965%	3.168%	3.705%	4.342%	3.905%	4.521%
Issue Price Per $100 Less Flotation	$99.60	$99.31	$99.30	$98.42	$102.22	$98.75
Yield on New Issue Including Flotation	3.088%	3.299%	3.784%	4.395%	3.985%	4.577%
Flotation Costs (Diff. in Pct Pts)	**0.123%**	**0.131%**	**0.079%**	**0.053%**	**0.080%**	**0.056%**
Avg. Flotation Cost (Pct. Points) (includes costs on page 2 and 3)	**0.075%**					
Previous Year's Average	0.078%					

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.

* The 2029 CSX Notes are a further issuance of the 4.250% notes issued November 2018 (Appendix E Page 1 previous year filing).

2019 Flotation Costs for Bonds

	NSC Sr Notes**	NSC Sr Notes	NSC Sr Notes***	UNP Notes	UNP Notes	CSX Notes	CSX Notes
From 424(b)	**4/29/2019**	**4/29/2019**	**4/29/2019**	**7/29/2019**	**7/29/2019**	**9/3/2019**	**9/3/2019**
Face Amount	$200,000,000	$400,000,000	$200,000,000	$500,000,000	$500,000,000	$400,000,000	$600,000,000
Coupon Rate	3.800%	4.100%	5.100%	3.550%	3.950%	2.400%	3.350%
Maturity Date	8/1/2028	5/15/2049	8/1/2118	8/15/2039	8/15/2059	2/15/2030	9/15/2049
Frequency of Coupon Payment	2	2	2	2	2	2	2
Interest Accrual Date	2/1/2019	5/8/2019	2/1/2019	8/5/2019	8/5/2019	9/12/2019	9/12/2019
Price To Investors	103.299	99.264	104.187	99.715	99.203	99.644	99.306
Proceeds from Sale (before expenses)	$206,598,000	$397,056,000	$208,374,000	$498,575,000	$496,015,000	$398,576,000	$595,836,000
Underwriter Fee as % of Gross Proceeds	0.650%	0.875%	1.000%	0.875%	0.875%	0.650%	0.875%
Underwriter's Fee	$1,300,000	$3,500,000	$2,000,000	$4,375,000	$4,375,000	$2,600,000	$5,250,000
Railroad Expenses Excluding Fee	$325,000.00	$650,000.00	$325,000.00	$50,000.00	$50,000.00	$120,000.00	$180,000.00
Page in 424(b) for Expenses	S-19	S-19	S-19	S-10	S-10	S-21	S-21
Calculated							
Yield Based on Price to Investors	3.391%	4.143%	4.893%	3.570%	3.990%	2.439%	3.387%
Issue Price Per $100 Less Flotation	$102.49	$98.23	$103.02	$98.83	$98.32	$98.96	$98.40
Yield on New Issue Including Flotation	3.490%	4.205%	4.949%	3.633%	4.035%	2.513%	3.436%
Flotation Costs (Diff. in Pct Pts)	**0.099%**	**0.061%**	**0.056%**	**0.063%**	**0.045%**	**0.075%**	**0.049%**

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

** The 2028 NSC Sr Notes are a further issuance of the 3.800% senior notes issued July 2018 (Appendix E Page 2 previous year filing).

*** The 2118 NSC Sr Notes are a further issuance of the 5.100% senior notes issued July 2018 (Appendix E Page 2 previous year filing).

2019 Flotation Costs for Bonds

	NSC Sr Notes	NSC Sr Notes	KSU Sr Notes	KSU Sr Notes
From 424(b)	**10/24/2019**	**10/24/2019**	**11/14/2019**	**11/14/2019**
Face Amount	$400,000,000	$400,000,000	$425,000,000	$425,000,000
Coupon Rate	2.550%	3.400%	2.875%	4.200%
Maturity Date	11/1/2029	11/1/2049	11/15/2029	11/15/2069
Frequency of Coupon Payment	2	2	2	2
Interest Accrual Date	11/4/2019	11/4/2019	11/18/2019	11/18/2019
Price To Investors	99.641	99.089	99.914	99.502
Proceeds from Sale (before expenses)	$398,564,000	$396,356,000	$424,634,500	$422,883,500
Underwriter Fee as % of Gross Proceeds	0.650%	0.875%	0.650%	0.875%
Underwriter's Fee	$2,600,000	$3,500,000	$2,762,500	$3,718,750
Railroad Expenses Excluding Fee	$400,000.00	$400,000.00	$1,150,000.00	$1,150,000.00
Page in 424(b) for Expenses	S-17	S-17	S-33	S-33
Calculated				
Yield Based on Price to Investors	2.591%	3.449%	2.885%	4.224%
Issue Price Per $100 Less Flotation	$98.89	$98.11	$98.99	$98.36
Yield on New Issue Including Flotation	2.677%	3.502%	2.992%	4.280%
Flotation Costs (Diff. in Pct Pts)	**0.086%**	**0.053%**	**0.107%**	**0.056%**

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

Example of Source for Bond Flotation Costs

424B5

Table of Contents

PROSPECTUS SUPPLEMENT
(To Prospectus Dated February 5, 2018)

$800,000,000

NORFOLK SOUTHERN

$200,000,000 3.800% Senior Notes due 2028
$400,000,000 4.100% Senior Notes due 2049
$200,000,000 5.100% Senior Notes due 2118

We are offering $200 million aggregate principal amount of our 3.800% senior notes due 2028 (the "2028 Notes"), $400 million aggregate principal amount of our 4.100% senior notes due 2049 (the "2049 Notes"), and $200 million aggregate principal amount of our 5.100% senior notes due 2118 (the "2118 Notes" and, collectively with the 2028 Notes and the 2049 Notes, the "Notes"). The 2028 Notes offered hereby constitute a further issuance of, and will be consolidated and form a single series of debt securities with, the $400,000,000 aggregate principal amount of the 2028 Notes dated August 2, 2018, and the 2118 Notes offered hereby constitute a further issuance of, and will be consolidated and form a single series of debt securities with, the $600,000,000 aggregate principal amount of the 2118 Notes dated August 2, 2018. The 2028 Notes will bear interest at a rate of 3.800% per year, the 2049 Notes will bear interest at a rate of 4.100% per year and the 2118 Notes will bear interest at a rate of 5.100% per year. We will pay interest semi-annually in arrears on the 2049 Notes on May 15 and November 15 of each year, beginning on November 15, 2019. We will pay interest on the 2028 Notes and the 2118 Notes on February 1 and August 1 of each year, beginning on August 1, 2019. The 2028 Notes will mature on August 1, 2028, the 2049 Notes will mature on May 15, 2049 and the 2118 Notes will mature on August 1, 2118. We may redeem a series of 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 2028 Note	Total	Per 2049 Note	Total	Per 2118 Note	Total
Price to Public (1)	103.299%	$206,598,000	99.264%	$397,056,000	104.187%	$208,374,000
Underwriting Discount	0.650%	$ 1,300,000	0.875%	$ 3,500,000	1.000%	$ 2,000,000
Proceeds to us (before expenses) (1)	102.649%	$205,298,000	98.389%	$393,556,000	103.187%	$206,374,000

(1) Plus accrued interest, if any, from May 8, 2019 in the case of the 2049 Notes, and from February 1, 2019 in the amount of $2,047,777.78 in the case of the 2028 Notes and in the amount of $2,748,333.33 in the case of the 2118 Notes.

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 8, 2019.

Joint Book-Running Managers

Citigroup **Goldman Sachs & Co. LLC**

Co-Managers

Capital One Securities **Fifth Third Securities** **MUFG** **PNC Capital Markets LLC**

SMBC Nikko **The Williams Capital Group, L.P.** **US Bancorp**

The date of this prospectus supplement is April 29, 2019.

Example of Source for Bond Flotation Costs

424B5

Table of Contents

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. and Goldman Sachs & Co. LLC are acting as representatives, have severally agreed to purchase, and we have agreed to sell to them, severally, the respective principal amounts of the Notes set forth opposite their names below:

Underwriters	Principal Amount of 2028 Notes	Principal Amount of 2049 Notes	Principal Amount of 2118 Notes
Citigroup Global Markets Inc.	$ 75,000,000	$ 150,000,000	$ 75,000,000
Goldman Sachs & Co. LLC	75,000,000	150,000,000	75,000,000
Capital One Securities, Inc.	7,143,000	14,286,000	7,143,000
Fifth Third Securities, Inc.	7,143,000	14,286,000	7,143,000
MUFG Securities Americas Inc.	7,143,000	14,286,000	7,143,000
PNC Capital Markets LLC	7,143,000	14,286,000	7,143,000
SMBC Nikko Securities America, Inc.	7,143,000	14,286,000	7,143,000
The Williams Capital Group, L.P.	7,143,000	14,285,000	7,143,000
U.S. Bancorp Investments, Inc.	7,142,000	14,285,000	7,142,000
Total	$ 200,000,000	$ 400,000,000	$ 200,000,000

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: 0.400% of the principal amount of the 2028 Notes, 0.525% of the principal amount of the 2049 Notes and 0.600% of the principal amount of the 2118 Notes. The underwriters may allow, and the dealers may reallow, a discount not in excess of the following, to other dealers: 0.250% of the principal amount of the 2028 Notes, 0.300% of the principal amount of the 2049 Notes and 0.350% of the principal amount of the 2118 Notes. 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 discounts, are estimated to be $1.3 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

2019 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	98.26%	3.420%	3.360%
Equipment Trust Certificates	App. C & Table 5	1.74%	2.783%	0.048%
Conditional Sales Agreements	Railroad Data	0.00%	--	--
Total Without Floatation Costs		100.00%		3.409%
Floatation Costs				
Bonds, Notes & Debentures	App. F & Table 8	98.26%	0.075%	0.074%
Equipment Trust Certificates	Tables 7 and 8	1.74%	0.073%	0.001%
Conditional Sales Agreements	Table 8	0.00%	not calculated	--
Total Floatation Costs		100.00%		0.075%
Weighted Cost of Debt				3.484%
Weighted Cost of Debt (rounded)				**3.48%**

Historical Weighted Cost of Debt (for comparison purposes only)

Item	Year	Reference	Weighted Cost
Previous Year	2018	EP 558 (Sub-No. 22) Served September 30, 2019	4.16%
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 1-10-2020

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 4, 2019	62.79	844,420,361	53,021,154
Friday, January 11, 2019	65.22	844,420,361	55,073,096
Friday, January 18, 2019	67.36	844,420,361	56,880,156
Friday, January 25, 2019	66.20	844,420,361	55,900,628
Friday, February 1, 2019	66.20	815,630,366	53,994,730
Friday, February 8, 2019	68.75	815,630,366	56,074,588
Friday, February 15, 2019	72.54	815,630,366	59,165,827
Friday, February 22, 2019	73.31	815,630,366	59,793,862
Friday, March 1, 2019	72.45	815,630,366	59,092,420
Friday, March 8, 2019	71.77	815,630,366	58,537,791
Friday, March 15, 2019	72.81	815,630,366	59,386,047
Friday, March 22, 2019	72.51	815,630,366	59,141,358
Friday, March 29, 2019	74.82	815,630,366	61,025,464
Friday, April 5, 2019	74.42	809,163,666	60,217,960
Friday, April 12, 2019	76.66	809,163,666	62,030,487
Thursday, April 18, 2019	78.97	809,163,666	63,899,655
Friday, April 26, 2019	79.17	809,163,666	64,061,487
Friday, May 3, 2019	80.52	809,163,666	65,153,858
Friday, May 10, 2019	78.69	809,163,666	63,673,089
Friday, May 17, 2019	78.40	809,163,666	63,438,431
Friday, May 24, 2019	74.90	809,163,666	60,606,359
Friday, May 31, 2019	74.47	809,163,666	60,258,418
Friday, June 7, 2019	78.07	809,163,666	63,171,407
Friday, June 14, 2019	77.17	809,163,666	62,443,160
Friday, June 21, 2019	78.67	809,163,666	63,656,906
Friday, June 28, 2019	77.37	809,163,666	62,604,993
Friday, July 5, 2019	78.40	798,175,808	62,576,983
Friday, July 12, 2019	78.58	798,175,808	62,720,655
Friday, July 19, 2019	70.31	798,175,808	56,119,741
Friday, July 26, 2019	68.96	798,175,808	55,042,204
Friday, August 2, 2019	67.12	798,175,808	53,573,560
Friday, August 9, 2019	66.57	798,175,808	53,134,564
Friday, August 16, 2019	65.09	798,175,808	51,953,263
Friday, August 23, 2019	64.62	798,175,808	51,578,121
Friday, August 30, 2019	67.02	798,175,808	53,493,743
Friday, September 6, 2019	67.52	798,175,808	53,892,831
Friday, September 13, 2019	72.47	798,175,808	57,843,801
Friday, September 20, 2019	68.62	798,175,808	54,770,824
Friday, September 27, 2019	68.91	798,175,808	55,002,295
Friday, October 4, 2019	66.71	782,336,546	52,189,671
Friday, October 11, 2019	69.05	782,336,546	54,020,339
Friday, October 18, 2019	68.67	782,336,546	53,723,051
Friday, October 25, 2019	72.32	782,336,546	56,578,579
Friday, November 1, 2019	72.27	782,336,546	56,539,462
Friday, November 8, 2019	74.03	782,336,546	57,916,375
Friday, November 15, 2019	71.61	782,336,546	56,023,120
Friday, November 22, 2019	70.51	782,336,546	55,162,550
Friday, November 29, 2019	71.54	782,336,546	55,968,357
Friday, December 6, 2019	71.27	782,336,546	55,757,126
Friday, December 13, 2019	72.78	782,336,546	56,938,454
Friday, December 20, 2019	73.18	782,336,546	57,251,388
Friday, December 27, 2019	72.85	782,336,546	56,993,217
Friday, January 3, 2020	72.89	782,336,546	57,024,511

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

Market Value for Common Equity

KSU Data from Bloomberg 1-10-2020

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 4, 2019	96.90	101,697,441	9,854,482
Friday, January 11, 2019	102.54	101,697,441	10,428,056
Friday, January 18, 2019	110.52	100,941,555	11,156,061
Friday, January 25, 2019	108.91	100,941,555	10,993,545
Friday, February 1, 2019	106.19	100,941,555	10,718,984
Friday, February 8, 2019	102.22	100,941,555	10,318,246
Friday, February 15, 2019	107.54	100,941,555	10,855,255
Friday, February 22, 2019	111.35	100,941,555	11,239,842
Friday, March 1, 2019	108.06	100,941,555	10,907,744
Friday, March 8, 2019	111.30	100,941,555	11,234,795
Friday, March 15, 2019	114.50	100,941,555	11,557,808
Friday, March 22, 2019	112.46	100,941,555	11,351,887
Friday, March 29, 2019	115.98	100,941,555	11,707,202
Friday, April 5, 2019	117.39	100,941,555	11,849,529
Friday, April 12, 2019	118.38	100,586,999	11,907,489
Thursday, April 18, 2019	125.03	100,586,999	12,576,392
Friday, April 26, 2019	124.51	100,586,999	12,524,087
Friday, May 3, 2019	125.25	100,586,999	12,598,522
Friday, May 10, 2019	120.66	100,586,999	12,136,827
Friday, May 17, 2019	121.95	100,586,999	12,266,585
Friday, May 24, 2019	120.85	100,586,999	12,155,939
Friday, May 31, 2019	113.28	100,586,999	11,394,495
Friday, June 7, 2019	117.50	100,586,999	11,818,972
Friday, June 14, 2019	116.91	100,586,999	11,759,626
Friday, June 21, 2019	119.50	100,586,999	12,020,146
Friday, June 28, 2019	121.82	100,586,999	12,253,508
Friday, July 5, 2019	122.94	100,586,999	12,366,166
Friday, July 12, 2019	122.77	99,913,836	12,266,422
Friday, July 19, 2019	123.43	99,913,836	12,332,365
Friday, July 26, 2019	124.46	99,913,836	12,435,276
Friday, August 2, 2019	121.20	99,913,836	12,109,557
Friday, August 9, 2019	118.77	99,913,836	11,866,766
Friday, August 16, 2019	120.07	99,913,836	11,996,654
Friday, August 23, 2019	119.50	99,913,836	11,939,703
Friday, August 30, 2019	125.80	99,913,836	12,569,161
Friday, September 6, 2019	128.91	99,913,836	12,879,893
Friday, September 13, 2019	133.09	99,913,836	13,297,532
Friday, September 20, 2019	132.04	99,913,836	13,192,623
Friday, September 27, 2019	132.52	99,913,836	13,240,582
Friday, October 4, 2019	127.80	99,913,836	12,768,988
Friday, October 11, 2019	133.50	99,119,608	13,232,468
Friday, October 18, 2019	145.25	99,119,608	14,397,123
Friday, October 25, 2019	144.49	99,119,608	14,321,792
Friday, November 1, 2019	146.19	99,119,608	14,490,295
Friday, November 8, 2019	153.31	99,119,608	15,196,027
Friday, November 15, 2019	153.54	99,119,608	15,218,825
Friday, November 22, 2019	151.93	99,119,608	15,059,242
Friday, November 29, 2019	152.42	99,119,608	15,107,811
Friday, December 6, 2019	152.64	99,119,608	15,129,617
Friday, December 13, 2019	151.44	99,119,608	15,010,673
Friday, December 20, 2019	155.10	99,119,608	15,373,451
Friday, December 27, 2019	154.48	99,119,608	15,311,997
Friday, January 3, 2020	155.26	99,119,608	15,389,310

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

Market Value for Common Equity

NSC Data from Bloomberg 1-10-2020

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 4, 2019	150.53	272,346,940	40,996,385
Friday, January 11, 2019	163.58	272,346,940	44,550,512
Friday, January 18, 2019	169.05	272,346,940	46,040,250
Friday, January 25, 2019	165.12	272,346,940	44,969,927
Friday, February 1, 2019	169.53	267,455,326	45,341,701
Friday, February 8, 2019	171.46	267,455,326	45,857,890
Friday, February 15, 2019	182.87	267,455,326	48,909,555
Friday, February 22, 2019	183.30	267,455,326	49,024,561
Friday, March 1, 2019	178.87	267,455,326	47,839,734
Friday, March 8, 2019	176.78	267,455,326	47,280,753
Friday, March 15, 2019	179.52	267,455,326	48,013,580
Friday, March 22, 2019	177.94	267,455,326	47,591,001
Friday, March 29, 2019	186.89	267,455,326	49,984,726
Friday, April 5, 2019	192.19	265,967,039	51,116,205
Friday, April 12, 2019	196.15	265,967,039	52,169,435
Thursday, April 18, 2019	198.58	265,967,039	52,815,735
Friday, April 26, 2019	204.14	265,967,039	54,294,511
Friday, May 3, 2019	205.06	265,967,039	54,539,201
Friday, May 10, 2019	202.59	265,967,039	53,882,262
Friday, May 17, 2019	203.52	265,967,039	54,129,612
Friday, May 24, 2019	199.27	265,967,039	52,999,252
Friday, May 31, 2019	195.14	265,967,039	51,900,808
Friday, June 7, 2019	203.04	265,967,039	54,001,948
Friday, June 14, 2019	194.74	265,967,039	51,794,421
Friday, June 21, 2019	197.19	265,967,039	52,446,040
Friday, June 28, 2019	199.33	265,967,039	53,015,210
Friday, July 5, 2019	200.94	263,406,773	52,928,957
Friday, July 12, 2019	205.90	263,406,773	54,235,455
Friday, July 19, 2019	195.19	263,406,773	51,414,368
Friday, July 26, 2019	189.99	263,406,773	50,044,653
Friday, August 2, 2019	182.02	263,406,773	47,945,301
Friday, August 9, 2019	177.70	263,406,773	46,807,384
Friday, August 16, 2019	173.00	263,406,773	45,569,372
Friday, August 23, 2019	169.28	263,406,773	44,589,499
Friday, August 30, 2019	174.05	263,406,773	45,845,949
Friday, September 6, 2019	175.06	263,406,773	46,111,990
Friday, September 13, 2019	182.19	263,406,773	47,990,080
Friday, September 20, 2019	180.49	263,406,773	47,542,288
Friday, September 27, 2019	180.87	263,406,773	47,642,383
Friday, October 4, 2019	172.82	260,746,663	45,062,238
Friday, October 11, 2019	178.50	260,746,663	46,543,279
Friday, October 18, 2019	181.91	260,746,663	47,432,425
Friday, October 25, 2019	188.25	260,746,663	49,085,559
Friday, November 1, 2019	189.92	260,746,663	49,521,006
Friday, November 8, 2019	195.44	260,746,663	50,960,328
Friday, November 15, 2019	191.07	260,746,663	49,820,865
Friday, November 22, 2019	193.18	260,746,663	50,371,040
Friday, November 29, 2019	193.50	260,746,663	50,454,479
Friday, December 6, 2019	190.93	260,746,663	49,784,360
Friday, December 13, 2019	190.07	260,746,663	49,560,118
Friday, December 20, 2019	194.59	260,746,663	50,738,693
Friday, December 27, 2019	195.20	260,746,663	50,897,749
Friday, January 3, 2020	196.44	260,746,663	51,221,074

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

Market Value for Common Equity

UNP Data from Bloomberg 1-10-2020

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 4, 2019	137.79	736,790,118	101,522,310
Friday, January 11, 2019	153.21	736,790,118	112,883,614
Friday, January 18, 2019	158.34	736,790,118	116,663,347
Friday, January 25, 2019	160.95	736,790,118	118,586,369
Friday, February 1, 2019	159.67	722,877,817	115,421,901
Friday, February 8, 2019	161.72	722,877,817	116,903,801
Friday, February 15, 2019	170.24	722,877,817	123,062,720
Friday, February 22, 2019	170.06	722,877,817	122,932,602
Friday, March 1, 2019	167.44	722,877,817	121,038,662
Friday, March 8, 2019	164.30	722,877,817	118,768,825
Friday, March 15, 2019	165.00	722,877,817	119,274,840
Friday, March 22, 2019	160.62	722,877,817	116,108,635
Friday, March 29, 2019	167.20	722,877,817	120,865,171
Friday, April 5, 2019	168.72	722,877,817	121,963,945
Friday, April 12, 2019	169.50	707,838,173	119,978,570
Thursday, April 18, 2019	176.66	707,838,173	125,046,692
Friday, April 26, 2019	177.22	707,838,173	125,443,081
Friday, May 3, 2019	179.20	707,838,173	126,844,601
Friday, May 10, 2019	175.92	707,838,173	124,522,891
Friday, May 17, 2019	174.62	707,838,173	123,602,702
Friday, May 24, 2019	172.17	707,838,173	121,868,498
Friday, May 31, 2019	166.78	707,838,173	118,053,250
Friday, June 7, 2019	171.97	707,838,173	121,726,931
Friday, June 14, 2019	166.99	707,838,173	118,201,897
Friday, June 21, 2019	168.87	707,838,173	119,532,632
Friday, June 28, 2019	169.11	707,838,173	119,702,513
Friday, July 5, 2019	170.03	707,838,173	120,353,725
Friday, July 12, 2019	174.05	704,529,750	122,623,403
Friday, July 19, 2019	175.30	704,529,750	123,504,065
Friday, July 26, 2019	174.23	704,529,750	122,750,218
Friday, August 2, 2019	173.52	704,529,750	122,250,002
Friday, August 9, 2019	168.01	704,529,750	118,368,043
Friday, August 16, 2019	166.25	704,529,750	117,128,071
Friday, August 23, 2019	159.98	704,529,750	112,710,669
Friday, August 30, 2019	161.96	704,529,750	114,105,638
Friday, September 6, 2019	164.60	704,529,750	115,965,597
Friday, September 13, 2019	171.45	704,529,750	120,791,626
Friday, September 20, 2019	166.38	704,529,750	117,219,660
Friday, September 27, 2019	162.69	704,529,750	114,619,945
Friday, October 4, 2019	156.32	704,529,750	110,132,091
Friday, October 11, 2019	161.39	694,199,885	112,036,919
Friday, October 18, 2019	161.50	694,199,885	112,113,281
Friday, October 25, 2019	172.33	694,199,885	119,631,466
Friday, November 1, 2019	172.53	694,199,885	119,770,306
Friday, November 8, 2019	176.10	694,199,885	122,248,600
Friday, November 15, 2019	176.27	694,199,885	122,366,614
Friday, November 22, 2019	175.94	694,199,885	122,137,528
Friday, November 29, 2019	175.99	694,199,885	122,172,238
Friday, December 6, 2019	172.00	694,199,885	119,402,380
Friday, December 13, 2019	177.03	694,199,885	122,894,206
Friday, December 20, 2019	180.40	694,199,885	125,233,659
Friday, December 27, 2019	181.41	694,199,885	125,934,801
Friday, January 3, 2020	180.98	694,199,885	125,636,295

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, December 31, 2018	Friday, January 4, 2019	$205,394,332	
2.	Monday, January 7, 2019	Friday, January 11, 2019	$222,935,278	
3.	Monday, January 14, 2019	Friday, January 18, 2019	$230,739,814	
4.	Tuesday, January 22, 2019	Friday, January 25, 2019	$230,450,469	Martin Luther King Day
5.	Monday, January 28, 2019	Friday, February 1, 2019	$225,477,316	
6.	Monday, February 4, 2019	Friday, February 8, 2019	$229,154,524	
7.	Monday, February 11, 2019	Friday, February 15, 2019	$241,993,357	
8.	Tuesday, February 19, 2019	Friday, February 22, 2019	$242,990,867	Washington's Birthday
9.	Monday, February 25, 2019	Friday, March 1, 2019	$238,878,560	
10.	Monday, March 4, 2019	Friday, March 8, 2019	$235,822,164	
11.	Monday, March 11, 2019	Friday, March 15, 2019	$238,232,275	
12.	Monday, March 18, 2019	Friday, March 22, 2019	$234,192,881	
13.	Monday, March 25, 2019	Friday, March 29, 2019	$243,582,562	
14.	Monday, April 1, 2019	Friday, April 5, 2019	$245,147,640	
15.	Monday, April 8, 2019	Friday, April 12, 2019	$246,085,981	
16.	Monday, April 15, 2019	Thursday, April 18, 2019	$254,338,473	Good Friday
17.	Monday, April 22, 2019	Friday, April 26, 2019	$256,323,167	
18.	Monday, April 29, 2019	Friday, May 3, 2019	$259,136,182	
19.	Monday, May 6, 2019	Friday, May 10, 2019	$254,215,070	
20.	Monday, May 13, 2019	Friday, May 17, 2019	$253,437,329	
21.	Monday, May 20, 2019	Friday, May 24, 2019	$247,630,048	
22.	Tuesday, May 28, 2019	Friday, May 31, 2019	$241,606,972	Memorial Day
23.	Monday, June 3, 2019	Friday, June 7, 2019	$250,719,258	
24.	Monday, June 10, 2019	Friday, June 14, 2019	$244,199,104	
25.	Monday, June 17, 2019	Friday, June 21, 2019	$247,655,725	
26.	Monday, June 24, 2019	Friday, June 28, 2019	$247,576,224	
27.	Monday, July 1, 2019	Friday, July 5, 2019	$248,225,831	
28.	Monday, July 8, 2019	Friday, July 12, 2019	$251,845,934	
29.	Monday, July 15, 2019	Friday, July 19, 2019	$243,370,539	
30.	Monday, July 22, 2019	Friday, July 26, 2019	$240,272,351	
31.	Monday, July 29, 2019	Friday, August 2, 2019	$235,878,420	
32.	Monday, August 5, 2019	Friday, August 9, 2019	$230,176,757	
33.	Monday, August 12, 2019	Friday, August 16, 2019	$226,647,360	
34.	Monday, August 19, 2019	Friday, August 23, 2019	$220,817,992	
35.	Monday, August 26, 2019	Friday, August 30, 2019	$226,014,490	
36.	Tuesday, September 3, 2019	Friday, September 6, 2019	$228,850,310	Labor Day
37.	Monday, September 9, 2019	Friday, September 13, 2019	$239,923,039	
38.	Monday, September 16, 2019	Friday, September 20, 2019	$232,725,395	
39.	Monday, September 23, 2019	Friday, September 27, 2019	$230,505,205	
40.	Monday, September 30, 2019	Friday, October 4, 2019	$220,152,988	
41.	Monday, October 7, 2019	Friday, October 11, 2019	$225,833,005	
42.	Monday, October 14, 2019	Friday, October 18, 2019	$227,665,881	
43.	Monday, October 21, 2019	Friday, October 25, 2019	$239,617,397	
44.	Monday, October 28, 2019	Friday, November 1, 2019	$240,321,070	
45.	Monday, November 4, 2019	Friday, November 8, 2019	$246,321,329	
46.	Monday, November 11, 2019	Friday, November 15, 2019	$243,429,423	
47.	Monday, November 18, 2019	Friday, November 22, 2019	$242,730,360	
48.	Monday, November 25, 2019	Friday, November 29, 2019	$243,702,884	
49.	Monday, December 2, 2019	Friday, December 6, 2019	$240,073,483	
50.	Monday, December 9, 2019	Friday, December 13, 2019	$244,403,451	
51.	Monday, December 16, 2019	Friday, December 20, 2019	$248,597,192	
52.	Monday, December 23, 2019	Friday, December 27, 2019	$249,137,764	
53.	Monday, December 30, 2019	Friday, January 3, 2020	$249,271,191	
		Average	**$239,328,804.01**	

Market Value for Common Equity

List of U.S. Stock Market Full-Day Holidays in 2019

	Day	Holiday
1.	Tuesday, January 1, 2019	New Year's Day
2.	Monday, January 21, 2019	Martin Luther King Jr. Day
3.	Monday, February 18, 2019	Washington's Birthday
4.	Friday, April 19, 2019	Good Friday
5.	Monday, May 27, 2019	Memorial Day
6.	Thursday, July 4, 2019	Independence Day
7.	Monday, September 2, 2019	Labor Day
8.	Thursday, November 28, 2019	Thanksgiving Day
9.	Wednesday, December 25, 2019	Christmas Day

Historical Risk Free Rates and Market Risk Premiums

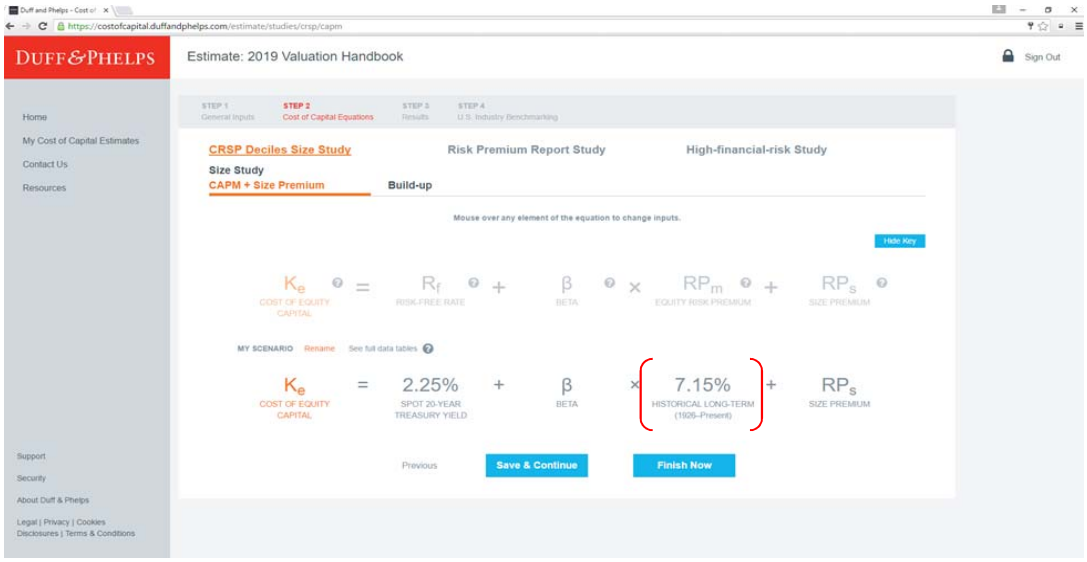
The Surface Transportation Board (STB) has used a Capital Asset Pricing Model (CAPM) as part of its cost of capital determination since 2006. Two major components of the STB's CAPM are the Risk-Free Rate, which is based on 20-Year U.S. Government Bonds, and the Market Risk Premium (a.k.a. Equity Risk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

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 2017-2019 are from the Duff & Phelps online Cost of Capital Navigator. 2006 through 2018 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 2020 *Cost of Capital Navigator*.The latest long-term equity risk premium, as shown below, is **7.15 percent**. The years used for this calculation are 1926 through 2019.



AAR Regression for 2019 Beta

AAR Regression for 2019 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	0.000709933	0.00135921	0.52	0.6019
ZSP5	1.094059624	0.07630787	14.34	<.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
	2015	2016	2017	2018	2019	
($ in millions)						
Revenue	11,811	11,069	11,408	12,250	11,937	58,475
Net Income	1,968	1,714	1,840	3,309	3,331	12,162
Extraordinary Items	0	0	0	0	0	0
Depreciation	1,208	1,301	1,315	1,331	1,349	6,504
Deferred Taxes	456	405	209	279	273	1,622
Capital Expenditures	2,562	2,398	2,040	1,745	1,657	10,402
Cash Flow	1,070	1,022	1,324	3,174	3,296	9,886
Cash Flow / Revenue	0.09059	0.09233	0.11606	0.25910	0.27612	0.16906
NIBEI / Revenue	0.16662	0.15485	0.16129	0.27012	0.27905	0.20799

Ibbotson Smoothed Cash Flow = $11,937 x 0.16906 = $2,018.11
Ibbotson Smoothed Net Income BEI = $11,937 x 0.20799 = $2,482.73

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
	2015	2016	2017	2018	2019	
($ in millions)						
Revenue	2,418.8	2,334.2	2,582.9	2,714.0	2,866.0	12,916
Net Income	483.3	477.9	474.2	627.2	538.7	2,601
Extraordinary Items	0.0	0.0	0.0	0.0	0.0	0
Depreciation	284.6	305.0	320.9	346.7	350.7	1,608
Deferred Taxes	135.8	104.8	186.3	91.7	53.1	572
Capital Expenditures	849.6	623.3	654.0	645.3	653.7	3,426
Cash Flow	54	264	327	420	289	1,355
Cash Flow / Revenue	0.02237	0.11327	0.12676	0.15486	0.10077	0.10491
NIBEI / Revenue	0.19981	0.20474	0.18359	0.23110	0.18796	0.20140

Ibbotson Smoothed Cash Flow = $2,866 x 0.10491 = $300.67
Ibbotson Smoothed Net Income BEI = $2,866 x 0.20140 = $577.22

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

Capital Expenditures					
Core CapX	688.0	563.6	585.4	520.3	587.2
Special programs	144.2	26.6	42.6	98.9	39.0
Meridian Speedway	17.4	33.1	26.0	26.1	27.5
Meridian, Otr RR	0.0	0.0			
Total CapX	849.6	623.3	654.0	645.3	653.7

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
	2015	2016	2017	2018	2019	
($ in millions)						
Revenue	10,511	9,888	10,551	11,458	11,296	53,704
Net Income	1,556	1,668	1,922	2,666	2,722	10,534
Extraordinary Items	0	0	0	0	0	0
Depreciation	1,059	1,030	1,059	1,104	1,139	5,391
Deferred Taxes	320	227	477	173	330	1,527
Capital Expenditures	2,385	1,887	1,723	1,951	2,019	9,965
Cash Flow	550	1,038	1,735	1,992	2,172	7,487
Cash Flow / Revenue	0.05233	0.10498	0.16444	0.17385	0.19228	0.13941
NIBEI / Revenue	0.14804	0.16869	0.18216	0.23268	0.24097	0.19615

Ibbotson Smoothed Cash Flow = $11,296 x 0.13941 = $1,574.80
Ibbotson Smoothed Net Income BEI = $11,296 x 0.19615 = $2,215.70

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
	2015	2016	2017	2018	2019	
($ in millions)						
Revenue	21,813	19,941	21,240	22,832	21,708	107,534
Net Income	4,772	4,233	4,638	5,966	5,919	25,528
Extraordinary Items	0	0	0	0	0	0
Depreciation	2,012	2,038	2,105	2,191	2,216	10,562
Deferred Taxes	765	831	868	338	566	3,368
Capital Expenditures	4,650	3,505	3,238	3,437	3,453	18,283
Cash Flow	2,899	3,597	4,373	5,058	5,248	21,175
Cash Flow / Revenue	0.13290	0.18038	0.20589	0.22153	0.24175	0.19691
NIBEI / Revenue	0.21877	0.21228	0.21836	0.26130	0.27266	0.23739

Ibbotson Smoothed Cash Flow = $21,708 x 0.19691 = $4,274.62
Ibbotson Smoothed Net Income BEI = $21,708 x 0.23739 = $5,153.36

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

2019 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	9.60	9.45	8.80	8.10	6.34	--	--	--	**8.80**
KSU	15.62	14.54	13.40	--	--	--	--	--	**14.54**
NSC	10.20	9.63	12.20	9.00	9.72	--	--	--	**9.72**
UNP	11.20	10.72	8.50	9.97	--	--	--	--	**10.35**

Simple Average of Medians = 10.85 percent.

2019 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	5	8.46	9.60	6.34
Filtered/Preliminary Mean**:	1	9.60	9.60	9.60
30 Day Ago Mean	5	8.90	9.60	7.77

	12/2018\	3/2019\	6/2019\	9/2019\	12/2018A
Reported	1.01	1.02	1.08	1.08	3.85
Surprise Mean	0.99	0.91	1.11	1.01	3.82
Surprise (%)	1.74	12.18	-2.26	6.65	0.74

* Only selected brokers below are included in the filtered mean

Check/Uncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date
✔	Permission Denied 54992	Permission Denie	9.60 ↓	Jul 16, 19	10.10	Apr 02, 19	Jul 16, 19
	CREDIT SUISSE	Landry, Allison M	9.45 ↓	Nov 26, 19	10.37	Oct 17, 19	Nov 26, 19
	Permission Denied 32	Permission Denie	8.80 ↓	Dec 05, 19	9.60	Oct 17, 19	Dec 16, 19
	Permission Denied 398136	Permission Denie	8.10 ↓	Oct 17, 19	8.80	Jul 17, 19	Oct 17, 19
	Permission Denied 392	Permission Denie	6.34 ↓	Dec 12, 19	7.77	Nov 12, 19	Dec 12, 19

2019 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	14.52	15.62	13.40
Filtered/Preliminary Mean**:	1	15.62	15.62	15.62
30 Day Ago Mean	3	14.19	15.62	12.10

	12/2018\	3/2019\	6/2019\	9/2019\	12/2018A
Reported	1.56	1.54	1.64	1.94	5.97
Surprise Mean	1.53	1.44	1.61	1.79	5.95
Surprise (%)	1.64	7.26	1.92	8.57	0.35

* 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	15.62 ↑	Nov 26, 19	15.20	Oct 18, 19	Nov 26, 19
	Permission Denied 392	Permission Denied	14.54 ↑	Dec 12, 19	12.00	Jun 14, 85	Dec 12, 19
	Permission Denied 398136	Permission Denied	13.40 ↑	Dec 05, 19	12.10	Oct 18, 19	Dec 05, 19

2019 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	5	10.15	12.20	9.00
Filtered/Preliminary Mean**:	1	10.20	10.20	10.20
30 Day Ago Mean	5	10.34	12.20	9.00

	12/2018\	3/2019\	6/2019\	9/2019\	12/2018A
Reported	2.57	2.51	2.70	2.49	9.51
Surprise Mean	2.29	2.18	2.79	2.59	9.25
Surprise (%)	12.07	15.09	-3.14	-3.68	2.80

* Only selected brokers below are included in the filtered mean

Check/Uncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date
✔	Permission Denied 54992	Permission Denie	10.20 ↓	Oct 23, 19	11.00	Apr 24, 19	Oct 23, 19
	CREDIT SUISSE	Landry, Allison M	9.63 ↓	Nov 26, 19	10.45	Oct 23, 19	Nov 26, 19
	Permission Denied 32	Permission Denie	12.20 ↓	Oct 08, 19	13.60	Sep 05, 19	Oct 23, 19
	Permission Denied 398136	Permission Denie	9.00 ↓	Oct 23, 19	10.00	Jul 25, 19	Oct 23, 19
	Permission Denied 392	Permission Denie	9.72 ↑	Dec 12, 19	8.00	Oct 08, 88	Dec 12, 19

2019 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	4	10.10	11.20	8.50
Filtered/Preliminary Mean**:	1	11.20	11.20	11.20
30 Day Ago Mean	4	10.26	11.20	8.50

	12/2018\	3/2019\	6/2019\	9/2019\	12/2018A
Reported	2.12	1.93	2.22	2.22	7.91
Surprise Mean	2.06	1.89	2.14	2.30	7.86
Surprise (%)	2.70	2.34	3.62	-3.62	0.62

* Only selected brokers below are included in the filtered mean

Check/Uncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date
✔	Permission Denied 54992	Permission Denie	11.20 ↓	Jul 18, 19	13.70	Apr 22, 19	Oct 17, 19
	CREDIT SUISSE	Landry, Allison M	10.72 ↓	Nov 26, 19	11.37	Oct 17, 19	Dec 04, 19
	Permission Denied 398136	Permission Denie	8.50 ↓	Oct 17, 19	11.30	Apr 18, 19	Oct 17, 19
	Permission Denied 392	Permission Denie	9.97 ↓	Dec 12, 19	10.62	Oct 18, 19	Dec 12, 19

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			3.21 %
Historical Growth Rate for Real GDP, 1929-2019		(page 2)	
Long Term Expected Inflation Rate			1.86
Rate for Long-Term U.S. Government Bonds	2.25	(page 5)	
Rate for 20-year U.S. Inflation-Indexed Bonds	0.39	(page 5)	
	1.86		
Stage 3 Growth Rate (real growth + inflation)			**5.07 %**

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			
2012	16,197.0	83	3.28%	3.28%
2013	16,495.4	84	3.27%	3.26%
2014	16,912.0	85	3.26%	3.25%
2015	17,403.8	86	3.25%	3.25%
2016	17,688.9	87	3.23%	3.22%
2017	18,108.1	88	3.22%	3.21%
2018	18,638.2	89	3.22%	
2019	**19,072.7**	**90**	**3.21%**	

(e) Real GDP in 2012 $ downloaded from BEA 2/27/2020.
(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 27-Feb-20

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
2012	16,197.0	16,197.0	1967Q4	881.4	4,615.9
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	18,224.8	17,403.8	1968Q3	950.8	4,825.8
2016	18,715.0	17,688.9	1968Q4	968.0	4,844.8
2017	19,519.4	18,108.1	1969Q1	993.3	4,920.6
2018	20,580.2	18,638.2	1969Q2	1,009.0	4,935.6
2019	21,427.1	19,072.7	1969Q3	1,030.0	4,968.2

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

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 2019.

	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 %

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 2019

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

Add to watchlist

72.09 -0.80 (-1.10%)

Buy

As of 2:24PM EST. Market open.

Summary | Company Outlook | Chart | Conversations | Statistics

Time Period: Show: Historical P

Currency in USD

Date	Open	High	Low	Close*
Jan 06, 2020	72.18	72.75	71.75	72.14
Jan 03, 2020	72.00	72.94	71.63	72.89
Jan 02, 2020	72.82	73.19	72.25	73.19
Dec 31, 2019	72.18	72.78	72.09	72.36
Dec 30, 2019	72.83	72.99	72.09	72.34
Dec 27, 2019	72.94	73.11	72.61	72.85
Dec 26, 2019	73.00	73.23	72.39	72.87
Dec 24, 2019	72.86	73.10	72.77	72.98
Dec 23, 2019	72.90	73.22	72.49	72.72

Retrieved January 6, 2020.
Link to web page: http://finance.yahoo.com/quote/CSX/history

Market Value Data for MSDCF
Stock Price for KSU - End of 2019

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

Add to watchlist

154.07 -1.19 (-0.77%)
As of 2:27PM EST. Market open.

Buy

Summary | Company Outlook | Chart | Conversations | Statistics | H

5 Top Stocks for Retirees
Claim Your Free List of 5 Dividend Stocks Today Wealthy Retirement

Time Period: Show: Historical Prices

Currency in USD

Date	Open	High	Low	Close*
Jan 06, 2020	154.17	154.50	152.88	154.04
Jan 03, 2020	152.95	155.40	152.95	155.26
Jan 02, 2020	153.94	155.48	153.22	155.45
Dec 31, 2019	152.96	153.89	152.59	153.16
Dec 30, 2019	154.22	154.65	152.67	153.09
Dec 30, 2019			**0.4** Dividend	
Dec 27, 2019	153.66	154.63	153.29	154.48
Dec 26, 2019	153.46	153.69	152.68	153.56
Dec 24, 2019	153.62	153.96	152.01	153.26
Dec 23, 2019	155.37	155.57	153.50	153.66

Retrieved January 6, 2020.
Link to web page: http://finance.yahoo.com/quote/KSU/history

Market Value Data for MSDCF
Stock Price for NSC - End of 2019

Norfolk Southern Corporation (NSC) Add to watchlist

Finance Home Watchlists My Portfolio Screeners Premium

194.00 -1.84 (-0.94%) Buy

As of 2:28PM EST. Market open.

Summary Company Outlook Chart Conversations Statistics H

Time Period: Show: Historical Prices

Currency in USD

Date	Open	High	Low	Close*
Jan 06, 2020	195.17	196.11	194.21	194.59
Jan 03, 2020	193.19	196.59	193.19	196.44
Jan 02, 2020	195.05	196.80	194.27	196.80
Dec 31, 2019	193.33	194.42	192.93	194.13
Dec 30, 2019	195.20	195.50	192.71	193.61
Dec 27, 2019	194.88	195.58	194.01	195.20
Dec 26, 2019	195.05	195.06	193.22	194.45
Dec 24, 2019	194.66	195.21	194.07	194.91
Dec 23, 2019	194.04	194.94	193.37	194.29

Retrieved January 6, 2020.
Link to web page: http://finance.yahoo.com/quote/NSC/history

Market Value Data for MSDCF
Stock Price for UNP - End of 2019

Union Pacific Corporation (UNP) Add to watchlist

Finance Home Watchlists My Portfolio Screeners Premium

-2.02 (-1.40%) Buy

As of 2:29PM EST. Market open.

Summary Company Outlook Chart Conversations Statistics

5 Top Stocks for Retirees
Claim Your Free List of 5 Dividend Stocks Today Wealthy Retiremer

Time Period: Show: Historical Price

Currency in USD

Date	Open	High	Low	Close*
Jan 06, 2020	179.70	180.06	178.40	178.48
Jan 03, 2020	179.54	181.19	178.29	180.98
Jan 02, 2020	180.95	182.38	179.97	182.27
Dec 31, 2019	179.96	181.26	179.54	180.79
Dec 30, 2019	181.15	181.38	179.60	180.15
Dec 27, 2019	181.00	181.59	180.66	181.41
Dec 26, 2019	180.36	180.92	179.50	180.81
Dec 24, 2019	179.76	180.48	179.36	179.89
Dec 23, 2019	180.40	180.68	179.00	179.42

Retrieved January 6, 2020.
Link to web page: http://finance.yahoo.com/quote/UNP/history

Market Value Data for MSDCF
Shares Outstanding for CSX - End of 2019

10/29/2019 Document

Table of Contents

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, 2019

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. See the definitions of "large accelerated filer", "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (check one)

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 782,336,546 shares of common stock outstanding on September 30, 2019 (the latest practicable date that is closest to the filing date).

Market Value Data for MSDCF
Shares Outstanding for KSU - End of 2019

10/29/2019 Document

Table of Contents

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, 2019

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 11, 2019
Common Stock, $0.01 per share par value	99,119,608 Shares

Market Value Data for MSDCF
Shares Outstanding for NSC - End of 2019

10/29/2019 Document

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, 2019**

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

Commission file number 1-8339

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

Virginia	**52-1188014**
(State or other jurisdiction of incorporation or organization)	(IRS Employer Identification No.)
Three Commercial Place	
Norfolk, Virginia	**23510-2191**
(Address of principal executive offices)	(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 ☒

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, 2019
Common Stock ($1.00 par value per share)	260,746,663 (excluding 20,320,777 shares held by the registrant's

Market Value Data for MSDCF
Shares Outstanding for UNP - End of 2019

Table of Contents

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, 2019

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	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 11, 2019, there were 694,199,885 shares of the Registrant's Common Stock outstanding.

2019 Cost of Equity Using STB's MSDCF

Company	CSX		KSU		NSC		UNP	
Year	2019		2019		2019		2019	
Inputs								
Initial Cash Flow	$2,018.11		$300.67		$1,574.80		$4,274.62	
Input for Terminal C.F.	$2,482.73		$577.22		$2,215.70		$5,153.36	
Stage One Growth	8.800%		14.540%		9.720%		10.350%	
Stage Two Growth	10.850%		10.850%		10.850%		10.850%	
Stage Three Growth*	5.070%		5.070%		5.070%		5.070%	
Year	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.
1	$2,196	$1,976	$344	$310	$1,728	$1,556	$4,717	$4,243
2	2,389	1,935	394	320	1,896	1,537	5,205	4,212
3	2,599	1,895	452	331	2,080	1,519	5,744	4,181
4	2,828	1,856	518	341	2,282	1,500	6,339	4,150
5	3,077	1,818	593	352	2,504	1,482	6,995	4,119
6	3,411	1,813	657	352	2,776	1,479	7,753	4,107
7	3,781	1,809	728	351	3,077	1,477	8,595	4,096
8	4,191	1,805	807	351	3,411	1,474	9,527	4,084
9	4,646	1,801	895	351	3,781	1,471	10,561	4,072
10	5,150	1,797	992	350	4,191	1,468	11,707	4,060
Terminal	110,367	38,517	33,920	11,979	103,482	36,257	243,093	84,313
Sum of Pres. Values		$57,024.51		$15,389.31		$51,221.07		$125,636.30
Market Value (input)		$57,024.51		$15,389.31		$51,221.07		$125,636.30
Cost of Equity	**11.10%**		**10.97%**		**11.06%**		**11.17%**	
Prev. Yr. Cost of Equity	17.66%		14.67%		15.96%		17.32%	

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	$28.50	$24.11	$26.305	$0.25
		Q2	$27.00	$25.00	$26.000	$0.25
		Q3	$29.45	$26.00	$27.725	$0.25
		Q4	$32.14	$27.30	$29.720	$0.25
		Year			**$27.438**	**$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	$27.438	3.645%
Cost of Preferred Equity	→			**3.64%**
Previous Year Cost of Preferred Equity				3.70%

Market Value of Preferred Equity

		Outstanding Shares	Average Price	Market Value
KSU	$25 par preferred, 4%, noncummulative	222,625	$27.438	**$6,108,276**

Sources: Kansas City Southern Form 10-K for 2019, Balance Sheet
Yahoo Finance (stock prices)