

Chief Investment Officer's Letter



Andrew H. Junkin, Chief Investment Officer

P.O. Box 2500 • 1200 East Main Street
Richmond, Virginia 23218-2500

Toll-free: 888-827-3847 • TDD: 804-344-3190

September 29, 2023

**To: Members of the Board of Trustees
and Participants of the Virginia Retirement System**

Fiscal year 2023 was volatile across the globe as inflation, rising interest rates and geopolitics remained front and center in the financial markets. In the United States, inflation reached 9.1% in June 2022 – the highest rate of inflation since the 1980s. Factors that played into the increase were accommodative fiscal and monetary policy on a global scale, strong labor markets and supply chain disruptions. In response, central banks began to increase borrowing costs.

The Federal Reserve raised interest rates 3.5% during the fiscal year. U.S. inflation declined to 3.2% as of July 2023 but is still above the Fed's target of 2%.

Political friction around the globe has also contributed to volatility in financial markets. The war in Ukraine rages on, now in its second year. Tension between the U.S. and China – representing the world's two largest economies – has grown over economic and defense issues.

Despite the challenging backdrop, the global stock market had a strong fiscal-year end with a 16.7% return, while other assets provided more mixed results as noted below.

PERFORMANCE OVERVIEW

While the economic news offered a mixed picture, the VRS portfolio returned 6.1% for the fiscal year, slightly underperforming the total fund benchmark of 6.3% and the 6.75% assumed rate of return. VRS' long-term investment strategy is focused on maximizing the return while minimizing risk. To achieve that balance, the VRS portfolio is highly diversified with investments around the globe in a variety of asset classes and strategies such as publicly traded stocks, private equity, fixed income, credit strategies, real assets, and other risk-mitigating and return-seeking strategies.

The VRS portfolio outperformed the fund benchmark and the assumed rate of return for intermediate-term periods (three and five years) and long-term periods (10, 15, 20 and 25 years) as shown below.

Annualized Return for Periods Ended June 30, 2023

	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	25 Years
VRS Total Fund	6.1%	10.8%	8.0%	8.2%	6.8%	7.9%	6.8%
Benchmark*	6.3%	7.9%	6.3%	7.1%	6.0%	7.1%	6.0%

Investment return calculations were prepared using a time-weighted return methodology based on market value, net of investment expenses.

The portfolio is positioned to be resilient in a variety of future economic scenarios. In addition, we are constantly evaluating opportunities for investments and strategies that will add value to the portfolio. Our long-term approach and focus mean that VRS is well positioned to support more than 800,000 members, retirees and beneficiaries into the future.

PERFORMANCE COMMENTARY

- Public stock markets staged a significant rally from October through June after stumbling in the first three months of the fiscal year, ending with a 16.7% return. The VRS equity portfolio was also up strongly, returning 15.6%. Our focus on value and lower volatility has served VRS well in the long term but proved challenging in the very narrow, technology-stock-led rally during fiscal year 2023.
- Fixed Income returns finished the year up 0.5%, ahead of the benchmark, which had a negative return of -0.1%, continuing the consistent run of the bond team's outperformance. Rising rates around the globe created a challenging environment for bond returns.
- The Credit Strategies portfolio, comprised of private credit strategies, was also affected by rising interest rates and some contraction in global credit availability. Returns for the year were positive but behind the benchmark (+5.7% versus +9.2%). However, longer-term returns have all exceeded the benchmark.
- Private Equity continues to provide strong excess returns to the VRS portfolio and has been the highest returning asset class over the long term.
- Real Assets finished the year ahead of its benchmark, returning +1.7% versus -0.7%. Overall, the real estate market was challenged by rising interest rates.

MARKET OUTLOOK

Inflation, interest rates and geopolitics will likely continue to be at the forefront of financial markets through the next year. The Federal Reserve has raised rates again in fiscal year 2024 and has indicated another rate hike is probable. Inflation has declined but remains stubbornly above the Fed's target, signaling an environment where higher rates are the norm.

VRS has been positioned defensively for some time and expects to remain that way until there is more clarity about the future direction of the economy. We are carefully balancing return and risk and remain committed to diversification as a key tenet of our success. We believe VRS is well positioned to deliver returns that allow the commonwealth to continue to meet its benefit obligations.

I'd like to express my appreciation to the VRS Board of Trustees and the Investment Advisory Committee for their support, as well as my colleagues on the VRS administrative team. And of course, I'd like to thank VRS' keen and tireless investment professionals for their work. Our collaborative efforts, paired with a long-term strategy, continue to build the fund to serve those who serve others in Virginia.

Sincerely,



Andrew H. Junkin
Chief Investment Officer

The Investment Section provides detailed information regarding the structure of the investment portfolio. This information includes performance, asset allocations, portfolio highlights, a list of VRS' money managers and public equity commissions for the fiscal year. The section also presents the System's investment management fees and expenses and an investment summary.

Investment Account

The VRS Board of Trustees has fiduciary responsibility to invest the fund solely in the interest of the beneficiaries of the System. As established by the *Code of Virginia*, "the Board shall invest the assets of the Retirement System with the care, skill, prudence and due diligence that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with like aims."

Benefit payments are projected to occur over a long period of time, allowing VRS to adopt a long-term investment horizon and asset allocation policy for the management of fund assets. Asset allocation policy is critical because it defines the basic risk and return characteristics of the VRS investment portfolio. Asset allocation targets are established using an asset-liability analysis designed to assist the Board in determining an acceptable volatility target for the fund and an optimal asset allocation policy mix. The asset-liability analysis considers both sides of the VRS balance sheet in order to estimate the potential impact of various asset class mixes on key measures of total plan risk, including the resulting estimated impact on funded status and contribution rates.

The Board delegates authority to the Chief Investment Officer to allocate the System's investments within the approved asset allocation policy and within the Board-approved active risk budget. The total fund active risk budget describes the degree of tolerance for yearly variation in the fund's performance relative to the Total Fund VRS Custom Benchmark.

The primary risk measure used for this purpose is Total Fund Tracking Error, calculated as the standard deviation of the difference between the fund's return and the return of the Total Fund VRS Custom Benchmark. From this measure, probability estimates can be derived to help the Board estimate the risk of underperforming the benchmark by certain margins.

The investment staff manages the VRS portfolio on a day-to-day basis according to policies and guidelines established by the Board. The staff manages assets on a direct basis and through outside investment managers. Managers employ both active and passive investment strategies. The Board has established various performance benchmarks to serve as tools for measuring progress toward the achievement of long-term investment goals.

The asset allocation mix of the VRS fund as of June 30, 2023, is shown in Figure 3.1.

FIGURE 3.1: ASSET ALLOCATION MIX

AS OF JUNE 30, 2023

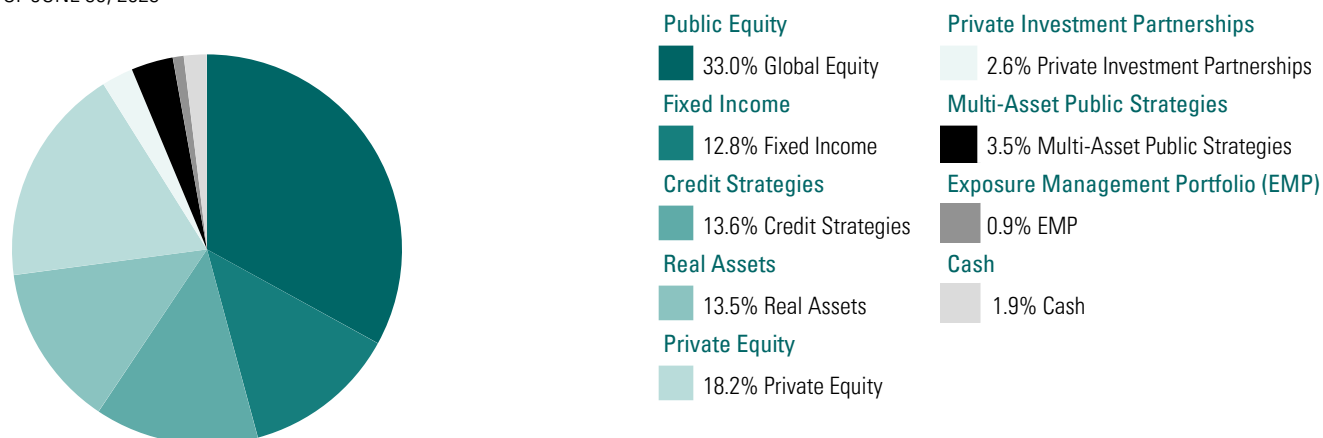


FIGURE 3.2: INVESTMENT PERFORMANCE SUMMARY

ANNUALIZED DATA FOR THE PERIOD ENDING JUNE 30, 2023

	1 Year	3 Years	5 Years	10 Years
1. Total Fund				
VRS	6.1%	10.8%	8.0%	8.2%
VRS Custom Benchmark ¹	6.3%	7.9%	6.3%	7.1%
2. Total Public Equity				
VRS	15.6%	11.6%	7.5%	8.7%
Custom Benchmark ²	16.7%	11.4%	8.0%	8.8%
3. Total Fixed Income				
VRS	0.5%	-2.5%	1.9%	2.3%
Custom Benchmark ³	-0.1%	-3.6%	0.8%	1.6%
4. Total Credit Strategies				
VRS	5.7%	8.3%	6.4%	6.1%
Custom Benchmark ⁴	9.2%	4.3%	4.4%	4.9%
5. Total Real Assets				
VRS	1.7%	11.2%	8.4%	10.0%
Custom Benchmark ⁵	-0.7%	7.6%	6.4%	8.0%
6. Total Private Equity				
VRS	-0.7%	24.9%	17.5%	16.1%
Custom Benchmark ⁶	-7.3%	16.0%	9.2%	11.1%
7. Total Private Investment Partnerships				
VRS	1.9%	16.0%	9.3%	N/A
Custom Benchmark ⁷	1.1%	10.5%	7.2%	N/A
8. Total Multi-Asset Public Strategies				
VRS	7.7%	7.3%	4.1%	N/A
Custom Benchmark ⁸	7.4%	4.8%	4.8%	N/A

Investment return calculations were prepared using a time-weighted return methodology based on market value, net of investment expenses.

FIGURE 3.2: INVESTMENT PERFORMANCE SUMMARY, cont.

¹ The VRS Custom Benchmark is a blend of the Asset Class Benchmarks at policy weights.

² Effective February 2020, the Public Equity Custom Benchmark is the MSCI ACWI IMI (net VRS tax rates) Index.

³ Effective July 2020, the Fixed Income Custom Benchmark is a blend of the Bloomberg U.S. Aggregate Bond Index (90%), Bloomberg Barclays U.S. HY Ba/B 2% Issuer Cap Index (5%), and JP Morgan EMBI Global Core Index (5%).

⁴ Effective January 2020, the Credit Strategies Custom Benchmark is a blend of the Morningstar LSTA Loan Index (60%), Bloomberg Barclays U.S. HY Ba/B 2% Issuer Cap Index (30%) and Bloomberg U.S. Aggregate Bond Index (10%).

⁵ Effective January 2023, the Real Assets Custom Benchmark is the market value weighted blend of the NCREIF Private Real Estate Benchmark (ODCE Index (net) lagged by three months) and the Other Real Assets Custom Benchmark (the CPI-U Index plus 400 basis points per annum lagged by three months).

⁶ Effective July 2020, the Private Equity Custom Benchmark is the MSCI ACWI IMI Index (net VRS tax rates) lagged by three months.

⁷ Effective July 2021, the Private Investment Partnerships Custom Benchmark is the weighted average of the custom Private Equity Benchmark (MSCI ACWI IMI Index (net VRS tax rates) lagged by three months) (33%), the NCREIF Private Real Estate Benchmark (ODCE Index (net) lagged by three months) (25%), the Other Real Assets Custom Benchmark (the CPI-U Index plus 400 basis points per annum lagged by three months) (8%), the Bloomberg U.S. HY Ba/B 2% Issuer Cap Index (17%), and the Morningstar LSTA Loan Index (17%).

⁸ Effective July 2018, the Multi-Asset Public Strategies Custom Benchmark is the market value weighted average of the benchmarks of the mandates (Dynamic Strategies and Risk-Based Investments) within the program.

Portfolio Highlights

PUBLIC EQUITY

The market value of the Total Public Equity Program as of June 30, 2023, was \$34.7 billion, representing approximately 33% of the total fund. The program is dominated by traditional strategies valued at \$27.9 billion, or 80.5%. The program also employs equity-oriented hedge fund strategies valued at \$6.8 billion, or 19.5%. The objective of the portfolio is to exceed the Custom Benchmark over longer-term periods, net of all costs. The current Custom Benchmark is the MSCI All Country World Index (ACWI) IMI (net of VRS tax rates).

The Traditional Public Equity portfolio had 58% invested in domestic equity and 42% in international equity. Internal assets are 47% of Total Public Equity.

At fiscal year-end, the ACWI IMI benchmark was comprised of 60.9% of the MSCI U.S. Investible Market Index (IMI), 28.2% of the MSCI World excluding U.S. IMI and 10.9% in the MSCI Emerging IMI.

Traditional Public Equity versus the MSCI ACWI IMI strategic sectors and region weights are as follows:

FIGURE 3.3: TRADITIONAL EQUITY CUSTOM BENCHMARK SECTORS AND REGIONS*

Strategic Sectors	VRS	ACWI IMI	Regions	VRS	ACWI IMI
Communication Services	7.18%	6.83%	North America	59.77%	64.00%
Consumer Discretionary	11.51%	11.50%	Europe/Middle East/Africa	19.18%	17.61%
Consumer Staples	7.37%	7.00%	Asia Pacific	19.64%	17.41%
Energy	4.15%	4.58%	Latin and South America	1.41%	0.98%
Financials	15.34%	15.16%	Total	100.00%	100.00%
Health Care	12.61%	11.69%			
Industrials	11.77%	11.55%			
Information Technology	19.95%	21.03%			
Materials	4.36%	4.96%			
Real Estate	2.56%	2.92%			
Utilities	3.20%	2.78%			
Total	100.00%	100.00%			

* Based on Barra's classification of sectors and regions and excludes cash.

The top 10 holdings in the Total Public Equity Program comprised 8.3% of the program at fiscal year-end.

Five companies, Bristol-Myers Squibb, Johnson & Johnson, Pfizer, Roche Holding and Verizon Communications were replaced by BroadCom, Exxon Mobil, Meta Platforms, Nvidia and Taiwan Semiconductor on this year's schedule.

FIGURE 3.4: PUBLIC EQUITY – TOP 10 EXPOSURES*

AS OF JUNE 30, 2023

Company	Fair Value	Shares
Apple	\$ 646,852,708	3,334,808
Microsoft	619,619,681	1,819,521
Alphabet	294,434,148	2,447,849
Amazon.com	235,703,655	1,808,098
Taiwan Semiconductor	198,494,927	8,615,654
Meta Platforms	194,991,431	679,460
BroadCom	187,270,330	215,891
Nvidia	186,760,792	441,494
Merck & Co.	171,821,719	1,479,691
Exxon Mobil	141,256,401	1,317,076

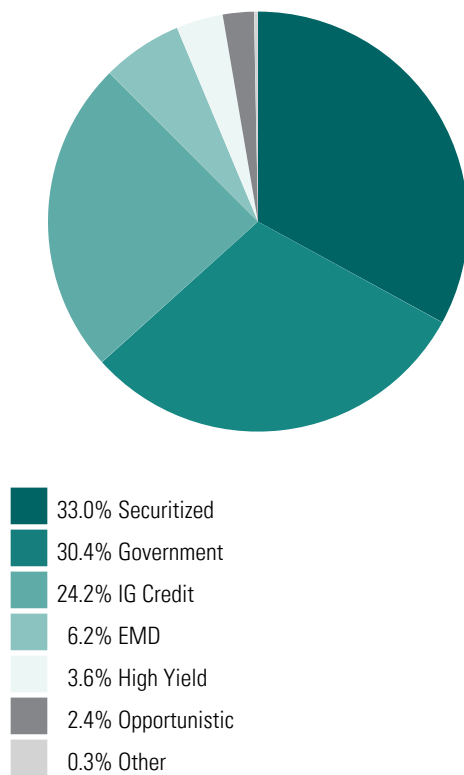
* Aggregated various share classes based on parent company. Refer to the "More Information" section on page 172 for details on how to request additional information.

FIXED INCOME

VRS invests a portion of its portfolio in fixed income investments to reduce total fund volatility, produce income and provide for some protection in the event of a deflationary environment. The market value of the Fixed Income Program as of June 30, 2023, was \$13.5 billion, representing approximately 13% of the total fund.

FIGURE 3.5: FIXED INCOME PORTFOLIO BY SECTOR ALLOCATION

AS OF JUNE 30, 2023



The Fixed Income Program is invested in a diversified portfolio of debt securities, such as government securities, corporate securities, mortgage-backed securities and emerging market debt. The objective of the program is to exceed the return of the Fixed Income blended benchmark comprised of 90% Bloomberg Barclays U.S. Aggregate Index, 5% JPM EMBI Global Core Index and 5% Bloomberg Barclays U.S. HY Ba/B 2% Issuer Constrained Index, while staying in compliance with risk limits. Approximately 95% of the Fixed Income Program is managed internally. For fiscal year 2023, the return of the program was 0.5% versus a return of -0.1% for the benchmark.

FIGURE 3.6: FIXED INCOME – TOP 10 HOLDINGS BY MARKET VALUE*

AS OF JUNE 30, 2023

Security	Par Value	Fair Value
UNIFORM MORTGAGE BACKED SECURITY	\$1,793,709,308	\$1,522,243,960
UNIFORM MORTGAGE BACKED SECURITY	353,992,765	332,887,338
UNIFORM MORTGAGE BACKED SECURITY	344,500,000	323,193,020
UNIFORM MORTGAGE BACKED SECURITY	331,200,000	291,393,734
TREASURY NOTE	300,000,000	269,484,000
UNIFORM MORTGAGE BACKED SECURITY	370,936,239	261,373,426
UNIFORM MORTGAGE BACKED SECURITY	281,443,543	256,959,646
UNIFORM MORTGAGE BACKED SECURITY	250,000,000	244,879,500
TREASURY NOTE	239,000,000	214,688,920
TREASURY NOTE	165,000,000	143,962,500

* Refer to the "More Information" section on page 172 for details on how to request additional information.

SHORT-TERM INVESTMENTS AND TRANSITION ACTIVITY

Generally, VRS desires to remain fully invested at all times and seeks to optimize its holdings of cash investments. Temporary cash balances are invested in short-term money market instruments with the goal of maintaining high credit quality and liquidity, as well as synthetically replicating exposure to equity and/or fixed income.

PRIVATE EQUITY

VRS invests in private equity to achieve returns greater than those available in the public equity markets. Specifically, the program seeks to outperform the Morgan Stanley Capital International All Country World Index (MSCI ACWI). Program returns are calculated on both a time-weighted basis and a dollar-weighted, or internal rate-of-return (IRR) basis. On a time-weighted basis, the program return for fiscal year 2023 was -0.7%. On a dollar-weighted, or IRR basis, the private equity one-year return was -1.2% as of March 31, 2023.

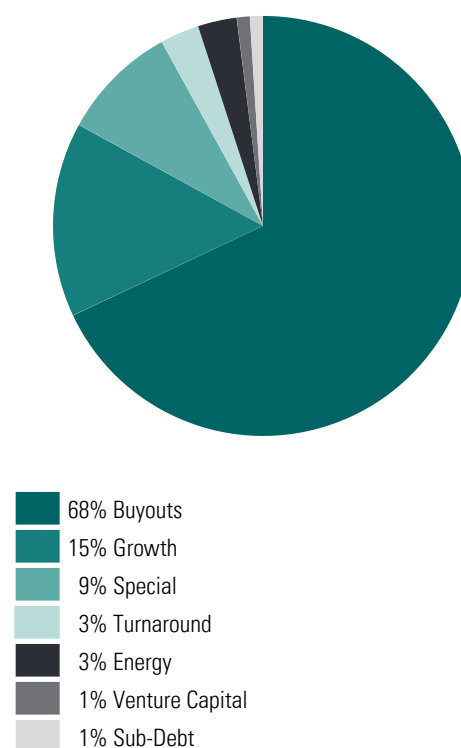
As of June 30, 2023, the carrying value of the program was approximately \$19.1 billion. Most of the program is invested in limited partnerships.

Sectors in which the program invests include leveraged buyouts, venture capital, growth, sub-

debt, turnaround, energy and special situations. The Private Equity Program's market value by subclass was as follows:

FIGURE 3.7: PRIVATE EQUITY PROGRAM

AS OF JUNE 30, 2023



REAL ASSETS

A portion of the VRS portfolio is invested in real assets to help diversify the Total Fund by providing exposure to asset classes and sectors that offer low historical correlations with the public markets and with the additional objectives of generating competitive risk-adjusted returns, significant operating cash flows and inflation linkages. The portfolio continued to grow in fiscal year 2023, producing a 1.7% return and outperforming the benchmark by 240 basis points. The private real estate portfolio delivered a 1.6% return.

Investments in infrastructure, natural resources, timberland and farmland produced a 4.2% return for the fiscal year.

The percentage of the Total Fund represented by the Real Assets portfolio fluctuated over the course of the year and stood at 13.5% at fiscal year-end. In dollar terms, the real asset portfolio grew to \$14.2 billion due primarily to asset income and appreciation, with contributions to new investments outpacing distributions from existing investments by approximately \$175 million.

At fiscal year-end, the portfolio strategy composition was approximately 66% private real estate, 18% infrastructure, 9% energy and mining, 4% timberland and 3% farmland. Real estate investment trusts (REITs) were discontinued as a Real Assets strategy effective January 1, 2023. Portfolio leverage as a percentage of total real assets was 33% as of June 30, 2023.

FIGURE 3.8: REAL ASSETS BY SECTOR

AS OF JUNE 30, 2023

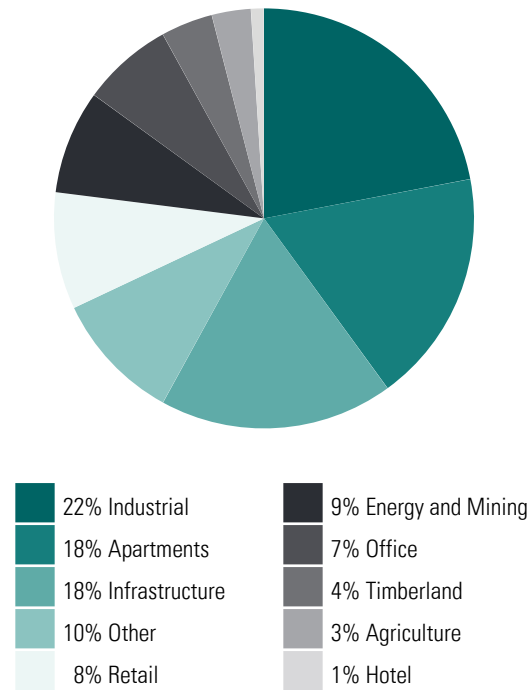
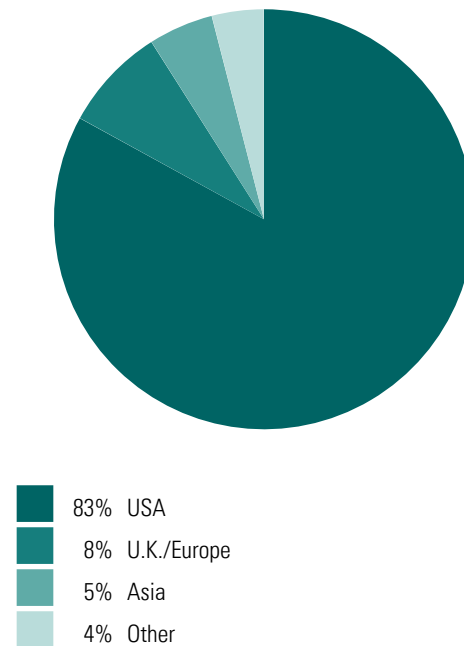


FIGURE 3.9: REAL ASSETS BY GEOGRAPHIC REGION

AS OF JUNE 30, 2023

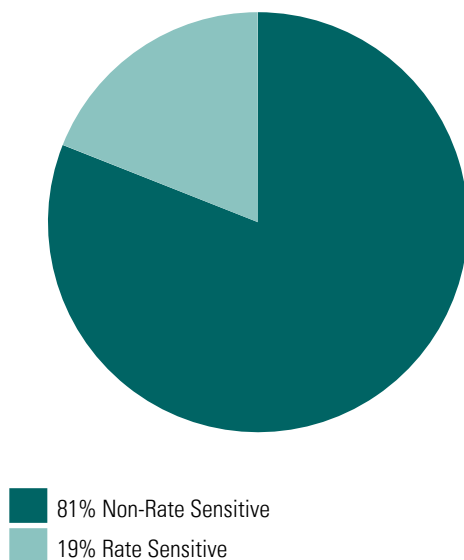


CREDIT STRATEGIES

VRS allocates a portion of the portfolio to credit-related investments. The Credit Strategies program generates returns through income and capital appreciation. The objective of the program is to provide an attractive risk/return profile relative to the Custom Credit Strategies benchmark. For the fiscal year, the program returned 5.7%, while the program's custom benchmark returned 9.2%.

FIGURE 3.10: CREDIT STRATEGIES PROGRAM

AS OF JUNE 30, 2023



CURRENCY

VRS has currency risk due to its investments in non-dollar-denominated assets. To help control this risk, VRS has a Currency Program that uses a combination of internal hedging strategies and external management. The external currency management part aims to lower overall Fund volatility and provide diversified alpha across the Fund. Investments include constrained positions in global currencies. The currency positions are typically traded on a forward basis, and thus no capital is necessary at the time of the trade. At forward settlement date, gains and losses are received/paid out against a notional value.

The current notional value, as of June 30, 2023, was \$1.8 billion. For the fiscal year, it returned -1.5% versus a zero benchmark.

MULTI-ASSET PUBLIC STRATEGIES

The Board of Trustees approved the Multi-Asset Public Strategies (MAPS) program on July 1, 2018, to manage strategies that add value and mitigate risk beyond the structure allowed by individual asset class program mandates. The program is separated into two portfolios with differing objectives. The Risk-Based Investment portfolio invests in strategies that offer meaningful diversification to the exposures of the overall Plan. The Dynamic Strategies portfolio seeks to add value across asset classes through the incorporation of macro perspectives. As of June 30, 2023, the total program had a market value of \$3.7 billion and was invested with seven multi-asset class public investments managers, three equity managers and two fixed income managers. During the fiscal year, it returned 7.7% against the program's custom benchmark, which returned 7.4%.

PRIVATE INVESTMENT PARTNERSHIPS

Beginning July 1, 2018, the VRS Board approved a strategic allocation to Private Investment Partnerships (PIP). These investments had previously been part of the Strategic Opportunities Portfolio. The objective of the program is to provide an attractive risk/return profile relative to the Private Investment Partnerships benchmark.

Managers in this program invest broadly across the private and less liquid components of the credit, private equity, real asset and real estate investment spaces. During the fiscal year the program returned 1.9% while its custom benchmark returned 1.1%.

MORE INFORMATION

A complete list of the investment portfolio is available upon request. Address requests to the VRS FOIA Coordinator, Virginia Retirement System, P.O. Box 2500, Richmond, VA 23218-2500. More information is available at varetire.org/web-policy/foia.

VRS Money Managers

The diversified investment structure as of June 30, 2023, is reflected in the following tables, which list VRS managers by investment program and style.

PUBLIC EQUITY MONEY MANAGERS

External Managers	Style Description
Acadian Asset Management	Emerging, Non-U.S. Small Cap
Ariel	Global
Arisaig	Emerging
Arrowstreet Capital	Global
Baillie Gifford	Emerging, Global
Jackson Square	U.S. Small Cap
J.P. Morgan	U.S. Large Cap
Lansdowne	Global
LSV Asset Management	Global, Non-U.S. Small Cap, U.S. Small Cap
Internal Portfolios	Style Description
Afton	U.S. Small Cap
Amherst	U.S. Large Cap
Internal Emerging	Emerging
Mobjack	U.S. Large Cap
Piedmont	Non-U.S. Large Cap
Rivanna	Global
Top 10 Equity Hedge Funds	Style Description
CET Energy Dynamics	Long/Short
Cevian	Activist
Coatue	Long/Short
Eminence	Long/Short
Farallon	Multi-Strat
Maverick Capital	Long/Short
Select	Long/Short
Taiyo	Activist
Theleme	Long/Short
ValueAct Capital	Activist

FIXED INCOME

Internal Portfolios	Style Description
VRS Investment Grade Credit	High-Quality Corporates
VRS Securitized	Mortgage and Other Asset-Backed Securities
VRS Government	U.S. and Other Government-Related Debt
VRS Emerging Market Debt	EM Sovereign and Quasi-Sovereign Debt
VRS Systematic High Yield	High-Yield Corporates
VRS Fixed-Income Opportunistic	Various Fixed-Income Related Assets

(Continued)

VRS Money Managers, *cont.*

FIXED INCOME, *cont.*

External Portfolios	Style Description
FI Payden & Rygel EMD	Emerging Market Debt
FI PIMCO EMD	Emerging Market Debt
FI Man Numeric High Yield	High-Yield Corporates

PRIVATE EQUITY – TOP 10 MANAGERS

	Style Description
Apax Partners	Buyout
Audax Group	Buyout, Sub-Debt
Bain Capital	Buyout
CVC Capital	Buyout
General Atlantic	Growth
Grosvenor	Customized Separate Account
Hellman and Friedman	Buyout
Stone Point	Buyout
TA Associates	Growth
Veritas	Buyout

CREDIT STRATEGIES – TOP 10 MANAGERS

	Style Description
Beach Point Capital Management	Distressed, Broadly Syndicated Loans, Opportunistic
Ares Management	Direct Lending, Mezzanine, Opportunistic, Asset Based
HPS Investment Partners	Direct Lending, Mezzanine
BlackRock	Direct Lending
Carlyle	Diversified Private Credit
Solus	Opportunistic, Broadly Syndicated Loans
J.P. Morgan	High Yield Bonds
KKR	Direct Lending, Distressed
PGIM	Investment Grade, Mezzanine
Sixth Street Partners	Distressed, Opportunistic

PRIVATE INVESTMENT PARTNERSHIPS

	Style Description
KKR	Multi-Asset Class Private Investments
Carlyle	Multi-Asset Class Private Investments

CURRENCY

	Style Description
Systematica	Developed

VRS Money Managers, *cont.*

REAL ASSETS – TOP 10 MANAGERS

Style Description

Blackstone Real Estate Partners	Core, Enhanced Core & Opportunistic Real Estate
Carson Companies	Core Real Estate
Clarion Partners	Enhanced Core Real Estate
Global Infrastructure Partners	Global Infrastructure
Industry Funds Management	Global Infrastructure
J.P. Morgan Asset Management Inc.	Core Real Estate
Morgan Stanley	Core Real Estate, Global Infrastructure
Pantheon Ventures	Global Infrastructure, Global Natural Resources
PGIM	Core & Enhanced Core Real Estate
Pritzker Realty Group	Core & Enhanced Core Real Estate

MULTI-ASSET PUBLIC STRATEGIES – TOP 10 MANAGERS

Style Description

AQR	Multi-Asset Class Public Investments
BlackRock	Multi-Asset Class Public Investments
Capstone	Multi-Asset Class Public Investments
Internal Portfolio Strategy	Multi-Asset Class Public Investments
J.P. Morgan	Multi-Asset Class Public Investments
Man AHL	Multi-Asset Class Public Investments
Orchard Global	Multi-Asset Class Public Investments
MetLife	Fixed Income
Nordea	Equities
Wellington	Equities

Public Equity Commissions

AS OF JUNE 30, 2023

Broker	Commission	Shares	Average Commission Per Share
Merrill Lynch, Pierce, Fenner & Smith, Inc., New York	\$ 1,533,459.42	124,701,232	\$ 0.0123
Goldman Sachs & Co., New York	1,169,919.73	110,171,270	0.0106
Credit Suisse, New York (CSUS)	927,186.85	172,322,179	0.0054
National Finl Svcs Corp, New York	573,205.39	34,350,328	0.0167
UBS Equities, London	395,081.61	191,704,568	0.0021
Morgan Stanley and Co., LLC, New York	380,020.70	121,119,309	0.0031
Sanford C. Bernstein & Co. Inc., London	325,380.44	58,278,036	0.0056
UBS Warburg Asia LTD, Hong Kong	223,023.43	89,817,408	0.0025
J.P. Morgan Secs LTD, London	213,596.61	40,026,337	0.0053
Sanford C. Bernstein & Co., New York	158,606.93	38,940,842	0.0041
Other Brokers	2,484,055.18	2,133,683,498	0.0012
Total FY 2023	\$ 8,383,536.29	3,115,115,007	\$ 0.0027

SCHEDULE OF INVESTMENT EXPENSES

FOR THE YEAR ENDED JUNE 30, 2023

(EXPRESSED IN THOUSANDS)

	Assets Under Management	Management Fees and Expenses
External Management:		
Public Equity Managers	\$ 11,385,380	\$ 47,275
Fixed Income Managers	3,979,174	3,841
Credit Strategies Managers	14,171,524	122,062
Real Assets Managers	14,873,343	138,350
Alternative Investment Managers	18,993,287	171,600
Hedge Funds Managers	16,600,797	63,805
Multi-Asset Class/Other Managers	7,451,391	26,762
Subtotal: External Management	87,454,896	573,695
Internal Management	20,305,907	49,536
Miscellaneous Fees and Expenses:		
Custodial Fees	—	4,500
Legal Fees	—	981
Other Fees and Expenses	—	36,551
Subtotal: Miscellaneous Fees and Expenses	—	42,032
Total	\$ 107,760,803	\$ 665,263

Investment Summary

In accordance with Section 51.1-124.31 of the *Code of Virginia* (1950), as amended, the Board of Trustees has pooled substantially all defined benefit plan assets of the Virginia Retirement System, the State Police Officers' Retirement System, the Judicial Retirement System, the Group Life

Insurance Fund and the Retiree Health Insurance Credit Fund into a common investment pool. The common investment pool of the pension trust funds, other trust funds and custodial funds held the following composition of investments at June 30, 2023 and 2022:

(EXPRESSED IN THOUSANDS)

	2023 Fair Value	Percent of Total Value	2022 Fair Value	Percent of Total Value
Bonds and Mortgage Securities:				
U.S. Government and Agencies	\$ 5,463,039	5.07%	\$ 5,103,220	4.96%
Mortgage Securities	7,743,993	7.18%	3,384,999	3.29%
Corporate and Other Bonds	5,893,713	5.47%	11,428,104	11.12%
Total Bonds and Mortgage Securities	19,100,745	17.72%	19,916,323	19.37%
Common and Preferred Stocks	24,906,540	23.10%	22,153,695	21.55%
Index and Pooled Funds:				
Equity Index and Pooled Funds	13,242,981	12.28%	12,627,783	12.28%
Fixed-Income Commingled Funds	823,876	0.76%	1,424,241	1.39%
Total Index and Pooled Funds	14,066,857	13.04%	14,052,024	13.67%
Real Assets	13,999,754	12.98%	13,735,587	13.36%
Private Equity	35,612,059	33.02%	32,530,492	31.66%
Short-Term Investments:				
Treasurer of Virginia – LGIP Investment Pool	76,066	0.07%	352,743	0.34%
Foreign Currencies	74,850	0.07%	53,176	0.05%
Total Short-Term Investments	150,916	0.14%	405,919	0.39%
Total Investments	\$ 107,836,871	100.00%	\$ 102,794,040	100.00%

Description of Hybrid Defined Contribution Plan

Defined contribution plan assets for Hybrid Retirement Plan members are maintained in two separate accounts. The Hybrid 401(a) Cash Match Plan account contains the hybrid plan member and employer mandatory contributions and the employer match on the voluntary member

contributions. The Hybrid 457 Deferred Compensation Plan account contains the hybrid plan member's voluntary contributions. The schedule below shows the assets in each investment option and the accumulated plan assets in each option.

HYBRID PARTICIPANT ACCOUNT PLAN ASSETS BY FUND OPTION*

AS OF JUNE 30, 2023

Fund Name	Hybrid 401(a)	Hybrid 457	Total
Retirement Portfolio	\$ 33,093,358	\$ 18,297,590	\$ 51,390,948
Target Date 2025 Portfolio	64,528,535	37,495,185	102,023,720
Target Date 2030 Portfolio	96,827,514	56,905,185	153,732,699
Target Date 2035 Portfolio	122,405,941	69,676,931	192,082,872
Target Date 2040 Portfolio	127,148,327	68,891,480	196,039,807
Target Date 2045 Portfolio	145,829,512	76,553,196	222,382,708
Target Date 2050 Portfolio	174,810,059	86,029,892	260,839,951
Target Date 2055 Portfolio	257,826,854	112,528,985	370,355,839
Target Date 2060 Portfolio	151,296,348	60,823,290	212,119,638
Target Date 2065 Portfolio	20,544,676	6,185,896	26,730,572
Money Market Fund	8,728,289	2,935,080	11,663,369
Stable Value Fund	4,294,399	6,124,801	10,419,200
Bond Fund	1,634,970	1,904,727	3,539,697
Inflation-Protected Bond Fund	1,130,470	1,174,948	2,305,418
High-Yield Bond Fund	1,667,250	2,172,043	3,839,293
Stock Fund	33,891,166	35,049,568	68,940,734
Small/Mid-Cap Stock Fund	9,338,609	10,087,631	19,426,240
International Stock Fund	4,733,555	5,195,378	9,928,933
Global Real Estate Fund	1,943,270	2,316,436	4,259,706
VRS Investment Portfolio – PIPVRSIP	34,587	22,507	57,094
VRS Investment Portfolio	407,590	368,614	776,204
Self-Directed Brokerage	1,604,514	1,805,736	3,410,250
Total Plan Assets	\$ 1,263,719,795	\$ 662,545,101	\$ 1,926,264,896

* Fund totals have been rounded to the nearest dollar amount.

Description of Defined Contribution Plans Investment Options

Participants in the System's Hybrid Retirement Plan benefit structure have access to a number of core investment options for contributions to their defined contribution plan. These options are intended to provide participants with a variety of investment choices while controlling the associated costs. In addition to the option-specific annual operating expense detailed in the Investment Option Performance Summary, participants pay an annual record-keeping fee of \$30.50 that is deducted from their accounts on a monthly basis (approximately \$2.54 per month).

Participants with more than one account in the Plan pay only one annual fee of \$30.50. At June 30, 2023, the plans provided the following core investment options to participants.

DO-IT-FOR-ME FUNDS

Retirement Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that object, the portfolio will be broadly diversified across global asset classes.

U.S. Bonds: 54.0% U.S. Large/Mid-Cap Stocks: 22.3% International Stocks: 11.7%
U.S. Inflation-Index Bonds: 5.7% U.S. Small-Cap Stocks: 3.2%
Commodities: 1.5% Developed Real Estate: 1.7%

Target Date 2025 Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Bonds: 49.9% U.S. Large/Mid-Cap Stocks: 24.8% International Stocks: 13.4%
U.S. Inflation-Index Bonds: 5.5% U.S. Small-Cap Stocks: 3.0%
Developed Real Estate: 2.0% Commodities: 1.5%

Target Date 2030 Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Bonds: 37.9% U.S. Large/Mid-Cap Stocks: 32.5% International Stocks: 18.3%
U.S. Inflation-Index Bonds: 4.8% Developed Real Estate: 2.6%
U.S. Small-Cap Stocks: 2.7% Commodities: 1.3%

Target Date 2035 Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large/Mid-Cap Stocks: 39.5% U.S. Bonds: 27.3% International Stocks: 22.7%
U.S. Inflation-Index Bonds: 3.9% Developed Real Estate: 3.3%
U.S. Small-Cap Stocks: 2.4% Commodities: 1.0%

Target Date 2040 Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large/Mid-Cap Stocks: 46.2% International Stocks: 27.1% U.S. Bonds: 17.2%
Developed Real Estate: 3.8% U.S. Inflation-Index Bonds: 2.8% U.S. Small-Cap Stocks: 2.2% Commodities: 0.7%

Target Date 2045 Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large/Mid-Cap Stocks: 52.3% International Stocks: 31.0% U.S. Bonds: 8.3%
Developed Real Estate: 4.3% U.S. Inflation-Index Bonds: 1.6% U.S. Small-Cap Stocks: 2.0% Commodities: 0.4%

Target Date 2050 Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large/Mid-Cap Stocks: 56.5% International Stocks: 33.6% Developed Real Estate: 4.5%
U.S. Bonds: 2.8% U.S. Small-Cap Stocks: 1.9% U.S. Inflation-Index Bonds: 0.6% Commodities: 0.1%

Target Date 2055 Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large/Mid-Cap Stocks: 57.9% International Stocks: 34.8% Developed Real Estate: 4.4%
U.S. Small-Cap Stocks: 1.9% U.S. Bonds: 0.8% U.S. Inflation-Index Bonds: 0.2% Commodities: 0.1%

Target Date 2060 Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large/Mid-Cap Stocks: 58.0% International Stocks: 34.7% Developed Real Estate: 4.4%
U.S. Small-Cap Stocks: 1.9% U.S. Bonds: 0.9% U.S. Inflation-Index Bonds: 0.1%

Target Date 2065 Portfolio: Seeks to provide for retirement outcomes consistent with investor preferences throughout the savings and drawdown phase based on quantitatively measured risk that investors, on average, may be willing to accept. In pursuit of that objective, the portfolio will be broadly diversified across global asset classes, with asset allocations becoming more conservative over time.

U.S. Large/Mid-Cap Stocks: 58.0% International Stocks: 34.8% Developed Real Estate: 4.4%
U.S. Small-Cap Stocks: 1.9% U.S. Bonds: 1.0%

HELP-ME-DO-IT FUNDS

Money Market Fund: Seeks to provide a high level of current income as is consistent with liquidity and stability of principal.

Other Repurchase Agreement: 56.4% Certificate of Deposit: 12.3% U.S. Treasury Debt: 4.9%
Asset-Backed Commercial Paper: 3.3% Non-Negotiable Time Deposit: 5.7% U.S. Government Debt: 3.6%
U.S. Government Agency Repurchase Agreement: 4.9% Financial Company Commercial Paper: 7.6%
U.S. Treasury Repurchase Agreement: 0.1% Non-Financial Company Commercial Paper: 1.2%

Stable Value Fund: Seeks to provide safety of principal, while earning a level of interest income consistent with an underlying portfolio of short- to intermediate-duration high-quality fixed income (bond) securities and cash or cash equivalents, and liquidity to accommodate participant transactions.

Corporates: 25.7% Asset-Backed: 19.6% Agency MBS: 18.4% U.S. Treasury/Agency: 13.1% Cash/Equivalents: 5.1%
CMBS: 8.1% Taxable Municipals: 4.9% Other U.S. Government: 4.4% Non-Agency MBS: 0.7%

Bond Fund: Seeks to track the performance of the Bloomberg Aggregate Bond Index. The index is an unmanaged index that represents the broad U.S. investment-grade bond market and is comprised of U.S. treasury securities, government agency bonds, corporate bonds, mortgage-backed securities, asset-backed securities and a small amount of foreign bonds traded in the U.S.

Treasury: 40.8% Mortgages: 26.5% Industrials: 14.3% Financials: 8.1% Non-U.S. Credit: 3.2% CMBS: 1.7%
Utilities: 2.0% Agencies: 1.0% Taxable Municipals: 0.6% Asset-Backed Securities: 0.3% Cash: 0.1%

Inflation-Protected Bond Fund: Seeks to track the performance of the Bloomberg U.S. Treasury Inflation-Protected Securities Index. The index is an unmanaged index that represents the U.S. Treasury Inflation-Protection Securities (TIPS) market. The index includes investment-grade TIPS with one or more years to final maturity.

U.S. Treasury: 98.6% Cash: 1.4%

High-Yield Bond Fund: Seeks to achieve returns that exceed, over time, its benchmark, the ICE BofA U.S. High-Yield BB-B Constrained Index. The index is an unmanaged index of BB-B rated securities that caps any single issuer exposure to 2.0%. The index is indicative of the higher quality high-yield bond market.

Consumer Cyclical: 21.8% Consumer Non-Cyclical: 17.7% Communications: 18.9%
Energy: 11.4% Capital Goods: 8.7% Technology: 6.1% Basic Industry: 3.7%
Finance: 2.2% Transportation: 2.8% Other/Cash: 4.6% Other Industrial: 0.9% Utilities: 1.3%

Stock Fund: Seeks to track the performance of the Standard & Poor's 500 Index. The index is an unmanaged index that represents the broad large-capitalization U.S. stock market and is comprised of 500 widely held U.S. stocks chosen by Standard & Poor's.

Information Technology: 28.3% Health Care: 13.4% Financials: 12.4%
Consumer Discretionary: 10.7% Communication Services: 8.4% Industrials: 8.5% Consumer Staples: 6.7%
Energy: 4.1% Utilities: 2.6% Real Estate: 2.5% Materials: 2.5%

Small/Mid-Capitalization Stock Fund: Seeks to track the performance of the Russell 2500 Index. The index is an unmanaged index that represents the broad middle- to smaller-capitalization U.S. stock market.

Industrials: 19.7% Financials: 14.9% Information Technology: 12.9% Health Care: 13.4%
Consumer Discretionary: 12.7% Real Estate: 7.4% Materials: 5.4%
Energy: 4.8% Consumer Staples: 3.3% Utilities: 2.8% Communication Services: 2.8%

International Stock Fund: Seeks to track the performance of the MSCI ACWI ex-U.S. IMI Index. The index is an unmanaged index that represents the equity performance of large, mid- and small-cap segments of developed and emerging markets, excluding the U.S.

Financials: 19.3% Industrials: 14.2% Consumer Discretionary: 12.1%
Information Technology: 11.9% Health Care: 9.2% Consumer Staples: 8.3% Materials: 8.4%
Communication Services: 5.3% Energy: 5.2% Real Estate: 2.9% Utilities: 3.2%

Global Real Estate Fund: Seeks to track the performance of the FTSE EPRA/NAREIT Developed Index. The index is an unmanaged index that is designed to reflect the performance of listed real estate companies worldwide, including the U.S.

Specialized REITs: 17.0% Retail REITs: 16.7% Residential REITs: 14.3% Industrial REITs: 14.7%
Office REITs: 7.5% Health Care REITs: 7.0% Diversified REITs: 7.1%
Real Estate Management & Development: 12.9% Hotel & Resort REITs: 2.7%

VRS Investment Portfolio (VRSIP): Seeks to maximize return while managing risk within an acceptable range. Due to the long-term nature of the defined benefit plan's liabilities, the horizon for investment decisions is generally defined as 10 years or longer.

Public Equity: 33.0% Private Equity: 18.2% Fixed Income: 12.8% Credit Strategies: 13.6%
Real Assets: 13.5% MAPS: 3.5% PIP: 2.6% EMP: 0.9% Cash: 1.9%

DO-IT-MYSELF FUNDS

Self-Directed Brokerage Account (SDBA): Allows investors to select from thousands of publicly traded mutual funds, exchange-traded funds (ETFs) and individual securities in addition to the available core investment options. The SDBA option is offered through TD Ameritrade. The SDBA option is for knowledgeable investors who acknowledge and understand the risks and costs associated with the investments contained in this option.

In addition to the annual record-keeping fee and operating expenses, this option is subject to transaction fees charged by TD Ameritrade and investment management-related fees and expenses for the funds or investments selected.

Investment Option Performance Summary: Defined Contribution Plans

AS OF JUNE 30, 2023

(RETURNS GREATER THAN ONE YEAR ARE ANNUALIZED)

DO-IT-FOR-ME PATH: TARGET DATE PORTFOLIOS

Investment Options	Inception Date	1 Year	3 Years	5 Years	10 Years or Since Inception	Total Annual Operating Expenses	
						As a %	Per \$1,000
Retirement Portfolio	08/01/05	5.04%	2.41%	3.97%	4.54%	0.06%	\$0.60
Custom Benchmark ¹		5.06%	2.41%	3.95%	4.51%		
Target Date 2025 Portfolio	07/05/06	5.96%	3.83%	4.57%	5.63%	0.06%	\$0.60
Custom Benchmark ¹		5.94%	3.81%	4.52%	5.57%		
Target Date 2030 Portfolio	08/01/05	8.16%	5.62%	5.44%	6.42%	0.06%	\$0.60
Custom Benchmark ¹		8.15%	5.59%	5.39%	6.33%		
Target Date 2035 Portfolio	07/05/06	10.21%	7.32%	6.26%	7.14%	0.06%	\$0.60
Custom Benchmark ¹		10.18%	7.26%	6.18%	7.04%		
Target Date 2040 Portfolio	08/01/05	12.23%	8.87%	6.98%	7.78%	0.06%	\$0.60
Custom Benchmark ¹		12.16%	8.78%	6.88%	7.66%		
Target Date 2045 Portfolio	07/05/06	14.06%	10.13%	7.58%	8.28%	0.06%	\$0.60
Custom Benchmark ¹		13.99%	10.02%	7.46%	8.14%		
Target Date 2050 Portfolio	09/30/07	15.21%	10.81%	7.91%	8.56%	0.06%	\$0.60
Custom Benchmark ¹		15.11%	10.67%	7.77%	8.42%		
Target Date 2055 Portfolio	05/19/10	15.54%	10.94%	8.00%	8.66%	0.06%	\$0.60
Custom Benchmark ¹		15.46%	10.82%	7.86%	8.52%		
Target Date 2060 Portfolio	11/17/14	15.55%	10.93%	7.99%	7.74%	0.06%	\$0.60
Custom Benchmark ¹		15.47%	10.81%	7.85%	7.58%		
Target Date 2065 Portfolio	09/23/19	15.58%	10.90%	N/A	8.61%	0.06%	\$0.60
Custom Benchmark ¹		15.48%	10.81%	N/A	8.56%		

(Continued)

Investment Option Performance Summary: Defined Contribution Plans (cont.)

HELP-ME-DO-IT PATH: INDIVIDUAL OPTIONS

Investment Options	Inception Date	1 Year	3 Years	5 Years	10 Years or Since Inception	Total Annual Operating Expenses	
						As a %	Per \$1,000
Money Market Fund	11/01/99	4.11%	1.54%	1.75%	1.14%	0.08%	\$0.80
Benchmark: FTSE 3-Month Treasury Bill Index							
Yield as of June 30, 2023, was 5.31%		3.75%	1.33%	1.57%	0.98%		
Stable Value Fund	02/01/95	2.07%	1.81%	2.05%	1.86%	0.23%	\$2.30
Custom Benchmark ²							
Yield as of June 30, 2023, was 2.72%		4.26%	2.09%	2.09%	1.84%		
Bond Fund	11/01/99	(0.90)%	(3.92)%	0.81%	1.57%	0.03%	\$0.30
Benchmark: Bloomberg U.S. Aggregate Bond Index							
		(0.94)%	(3.96)%	0.77%	1.52%		
Inflation-Protected Bond Fund	07/30/02	(1.33)%	(0.08)%	2.56%	2.17%	0.03%	\$0.30
Benchmark: Bloomberg U.S. Treasury Inflation-Protected Securities Index							
		(1.40)%	(0.12)%	2.49%	2.08%		
High-Yield Bond Fund	05/31/04	7.13%	3.78%	3.56%	4.57%	0.39%	\$3.90
Benchmark: ICE BofA U.S. High-Yield BB-B Constrained Index							
		8.57%	2.64%	3.38%	4.35%		
Stock Fund	11/01/99	19.58%	14.61%	12.34%	12.89%	0.01%	\$0.10
Benchmark: S&P 500 Index							
		19.59%	14.60%	12.31%	12.86%		
Small/Mid-Cap Stock Fund	11/01/99	13.70%	12.37%	6.60%	9.46%	0.02%	\$0.20
Benchmark: Russell 2500 Index							
		13.58%	12.29%	6.55%	9.38%		
International Stock Fund	11/01/99	12.68%	7.65%	3.69%	5.23%	0.06%	\$0.60
Benchmark: MSCI ACWI ex-U.S. IMI Index ³							
		12.47%	7.33%	3.38%	4.98%		
Global Real Estate Fund	10/01/02	(3.47)%	4.24%	0.80%	3.73%	0.08%	\$0.80
Benchmark: FTSE EPRA/NAREIT Developed Index							
		(4.56)%	3.33%	(0.10)%	2.89%		
VRS Investment Portfolio (VRSIP)	07/01/08	6.09%	10.82%	8.04%	8.16%	0.59%	\$5.90
VRS Custom Benchmark ⁴							
		6.27%	7.95%	6.29%	7.06%		

¹ Benchmarks are calculated using blended returns of third-party indices that proportionately reflect the respective weightings of the Portfolios' asset classes. Weightings are adjusted quarterly to reflect the Portfolios' asset allocation shifts over time. Indices currently used to calculate the custom benchmarks are Russell 1000 Index, Russell 2000 Index, MSCI ACWI ex-U.S. IMI Net Dividend Return Index, Bloomberg U.S. Long Credit Bond Index, Bloomberg U.S. Intermediate Credit Bond Index, Bloomberg U.S. Long Government Bond Index, Bloomberg U.S. Intermediate Government Bond Index, Bloomberg U.S. Securitized: MBS, ABS, and CMBS Index, Bloomberg U.S. Treasury Inflation Protection Securities (TIPS) Index (Series L), FTSE EPRA NAREIT Developed Index, and the Bloomberg Commodity Index Total Return.

² Effective August 2016, the benchmark represents a hypothetical return generated by the monthly yields of actively traded U.S. Treasuries based on [50% two-year maturity + 50% three-year maturity] plus an annualized spread of 0.25% and is representative of the Fund's expected return profile, given how the Fund is managed and book value accounting treatment. Prior to August 2016, the custom benchmark was based on the monthly yield of actively traded U.S. Treasuries with a three-year maturity plus an annualized spread of 0.50%. The benchmark returns are linked.

³ Effective August 2016, the performance benchmark is the MSCI ACWI ex-U.S. IMI Index. It was the MSCI World ex-U.S. Index from July 2012 through July 2016, and prior to July 2012, it was the MSCI EAFE Index. The benchmark returns are linked.

⁴ The VRS Custom Benchmark is a blend of the asset class benchmarks at policy weights.