

## Executive Summary

VRE and PFM commenced an effort in February 2015 to develop a long-term Strategic Financial Forecast that will inform executive decision making regarding system operations and expansion. The primary objective of this effort was to provide a dynamic financial forecasting tool (for revenue, operating expense and capital expense projections) that models varying service profiles contemplated by VRE over a 25-year planning period. Five scenarios were developed for evaluation and presented to VRE staff, key stakeholders, and the VRE Operations Board at various meetings since the project began. Operational characteristics of these scenarios ranged from maintaining service and ridership at current levels to full-implementation of VRE’s System Plan 2040 Vision.

The scenarios revealed on average the need for annual additional operating revenue (above the revenues generated from assumptions used for fare and local subsidy increases) ranging from zero dollars (\$0) for the fiscally balanced approach, to \$21.2 million of additional annual need. Primary drivers of this operating need were contractual increases for train operations, maintenance of equipment and access to railroad infrastructure; additional expenses stemming from expansion of services; and inflation factors consistent with industry indices that were applied to expenses as appropriate. In addition to operational cost drivers, scenarios require significant capital investment ranging from a base capital program need of \$2.6 billion to \$4.1 billion. Of this amount \$506 million to \$1.3 billion remains unfunded; this translates to \$20.2 to \$52.1 million of average annual capital need between the varying scenarios. Capital investments include funding for track and signal commitments, expansion and replacement of rolling stock, and maintaining assets in a state of good repair. The scenarios developed are listed in the below table in order of increasing additional investment needed.

Scenario	Description	Average Annual Operating Revenue Need (\$ millions)	Average Annual Capital Need (\$ millions)	Total (\$ millions)	FY40 Ridership (000’s)
Baseline	Financially Constrained	0	N/A	N/A	0
Ridership Equal	Fiscally Balanced	0	20.3	20.3	19.2
Natural Growth	Grows with Base Market	9.3	34.8	44.1	31.2
Modified Service Plan	Limited Expansion	12.4	50.6	63.0	44.9
System Plan 2040	Full System Expansion	13.7	52.1	65.8	52.2
Steady State	Continued Operations	20.3	20.3	40.6	19.2

The purpose of this report is to describe the operational profile and capital requirements of each scenario, provide global conclusions and takeaways drawn from the analyses performed, and identify VRE’s next steps in its effort to achieve financial stability for the current service and pursue the vision set forth by its System Plan 2040. This effort yielded the following key findings (further described herein):

- Regardless of scenario, VRE’s operational expenses will continue to escalate and additional revenue will be required to achieve fiscal balance.
- Regardless of scenario, VRE requires a significant core level of capital investment totaling \$2.6 billion over the period from FY16 to FY40.

- Raising fares, *alone*, to close the financial gap is not a viable solution and creates unintended consequences.
- Higher ridership due to enhanced service levels and system expansions could defray future operating expenses.
- VRE needs additional *diversified revenue beyond existing sources* to achieve financial stability over the long term, with VRE dedicated funding as an important component of that new revenue.

The effort culminated in February 2016 with a final presentation to the VRE Operations Board and this Board's acceptance of VRE Staff's recommendation to pursue a strategic direction for future growth as follows:

- VRE will continue to follow the Natural Growth profile of providing additional service through lengthening existing trains in response to ridership growth over time due to regional increases in population and employment.
- VRE will continue to pursue funding to implement the service concepts included in the System Plan 2040 profile such as additional peak trains; the Gainesville-Haymarket extension and reverse-peak and off-peak service.

The strategic financial forecasting tool and analysis has provided valuable information and insight to help VRE formulate its long-term vision for system operations, expansion of services and achieving fiscal balance. In the near future VRE will work with State partners, notably the Commonwealth Transportation Board ("CTB") and the Department of Rail and Public Transportation ("DRPT") to preserve the financial health of the existing service and to develop a financing strategy that funds needed capital investment and eliminates operating deficits to accomplish VRE's defined strategic direction and contemplated vision.

## Core Assumptions

VRE staff and PFM engaged in various meetings and webinars to develop universal assumptions for use across all scenarios. These core assumptions were used to project revenue and expense growth and were applied to all scenarios modeled over the 25-year assessment period, except where noted. Using these assumptions VRE was able to quantify and compare short and long-term financial impacts of strategic operations decisions and considerations. Core assumptions are grouped as revenues, expenses, or operational characteristics and are further defined below.<sup>1</sup>

Revenue Category	Base Assumption
Federal Formula Funds	0% Growth from FY16 through FY40
Access Fees	FY17 – FY20 State provides 84% of access fees (from all partners) FY21 – FY25 Gradual ramp down from 84% to 50% FY26 – FY40 State providers 50% of access fees
State Funding – Operations	0% increase every year
State Funding – Capital	Current funding levels
Fare Increase*	3% increase every other year starting in FY 17
Local Subsidy	3% increase every other year starting in FY19; VRE projects a 5% increase in FY 17 per adopted FY17 budget

\*Applies to all scenarios except Ridership Equal.

Expense assumptions include an application of the Consumer Price Index (CPI) and the relevant American Association of Railroads Index (AAR) to various VRE expenses as appropriate; and growth rates prescribed by contractual obligations that VRE maintains with its operators.

Expense Category	Base Assumption
Contracted Train Operations	2% annual increase (driven by CPI)
Facilities Maintenance & Other Expenses	2% annual increase (driven by CPI)
CSX Transportation Access Fees	4% annual increase (contractual rate)
Amtrak Access Fees	3% annual increase (3-yr avg. actual costs)
Norfolk Southern Access Fees	3% annual increase (driven by AAR)
Equipment Operations	3% annual increase (driven by AAR)
Budgeted Operating Reserve	2-months of Operating Expenditures

Higher YOY expense growth may be incurred due to additional expenses stemming from expanded service in certain scenarios

Key assumptions for ridership, capital expenditure costs, and investment priorities were provided by VRE and incorporated into the model. The below table shows select operating and capital characteristics of the assessed scenarios and the data source(s) used to inform projections.

Operational Category	Base Assumption
Ridership	Metropolitan Washington Council of Governments (MWCOG) adjusted based on VRE historical trends
Capital Costs	Capital Costs and Expenditures estimated by VRE Planning
Capital Funding Priorities	State of Good Repair is funded first

<sup>1</sup> VRE's revenues are obtained from a variety of sources, each having certain limitations and uncertainty toward future growth. To the extent actual revenue, expenses, and operating characteristics deviate from base assumptions, forecasts as modeled within the financial plan will be impacted by this deviation.

## Scenario Descriptions and Key Findings

Based on discussions with VRE executive, finance, planning and operations staff, and input from the VRE Operations Board at the May, July, and September 2015 Board meetings, VRE and PFM developed five scenarios that modeled system operations, financial requirements, and contemplated expansions. Each scenario has a unique operational profile and capital investment requirement that was forecast over a 25-year horizon. Core assumptions for service level, ridership, operating expense and capital expenditures were integrated into each scenario as described in the previous section, except where noted. The following section further describes the operational profile, key metrics and capital investment requirements for each scenario.

### Baseline Scenario – “Financially Constrained”

The Baseline Scenario is a financially constrained scenario that demonstrates what operations would look like with no additional resources beyond the application of a 3% fare and local subsidy increase every other year. The scenario starts with a forecasted amount of constrained revenue and then illustrates the operational impacts of reducing operating expenses and service to match this constrained revenue. Given the operational complexity of the consequences of this scenario, it was developed outside the financial model. Operationally, this scenario results in the unwinding of VRE’s service and trains being taken out of service. Additionally, this scenario raises concern regarding VRE’s financial obligations to repay the federal interest in its equipment.

#### Key Takeaways for the Baseline Scenario

- This scenario requires a repeated pattern of service reductions to stay within the available revenue constraints.
- Service reductions would cause overcrowding, eventually leading to fewer riders using VRE.
- This scenario results in VRE ceasing operation by 2033, even with the 3% fare and local subsidy increase every other year.

### Ridership Equal Scenario – “Fiscally Balanced”

VRE’s Ridership Equal scenario was designed to achieve fiscal balance by increasing fares to eliminate operating deficits. Ridership levels are maintained at current FY16 levels – 19,200 daily trips, and continue at this level throughout the 25-year planning period. Service and operations are supported by existing infrastructure and currently planned and funded FY16 projects.

<b>Ridership Equal Scenario Summary and Key Metrics:</b>	
Daily Trips (FY16 / FY40)	19,200 / 19,200
Daily Trains (FY16 / FY40)	32 / 32
Total Operating Costs (FY/16 / FY40)	\$81.8 / \$145 million
Additional Operating Need (Annual)	Fiscally Balanced
Fare Box Recovery Ratio (FY16 / FY40)	52% / 68%
Fare (FY16 / FY40) in FY16 \$	7.90 / 20.56
Total Capital Investment	\$2.6 billion
Unfunded Capital Investment	<b>\$506 million / \$20.2 million annually</b>

Ridership Equal follows the core assumptions previously described with one difference – fares are not increased at a rate of 3% every other year. For this scenario to achieve fiscal balance fares are deliberately increased each year at the rate required to eliminate the projected annual operating need. This rate on average is approximately 4% per year from FY16 to FY40. In FY40 fares would reach \$20.56 on average per trip (FY16 dollars). The local subsidy increase of 3% every other year remains consistent with core assumptions.

Though Ridership Equal holds current service and system capacity constant, extensive capital investment is required. Capital need for the scenario totals \$2.6 billion over the 25-year horizon, of which approximately \$770 million is funded, \$1.36 billion is assumed to be available from potential sources, and \$506 million remains unfunded.<sup>2</sup> Averaged over the 25-year planning period, VRE would require \$20.3 million per year to fund its unfunded capital needs. Primary drivers of unfunded capital investment in this scenario include the purchase of replacement rolling stock and the completion of the Long Bridge project – a contractual agreement VRE has entered into with CSX.

**Key Takeaways for the Ridership Equal Scenario:**

- Ridership Equal achieves fiscal balance for operations solely through raising fares. There is no additional need for operating revenues under this scenario. However, this fiscal balance heavily relies on an elasticity of demand formula to project the impact of substantial fare increases.
- VRE ridership would remain at approximately 19,200 daily trips from FY16 to FY40 and VRE would not grow with its market.
- Capital requirements total \$2.6 billion and approximately \$506 million remains unfunded. This amounts to an average annual capital need of \$20.3 million per year over the 25-year horizon.

**“Steady State” Scenario – “Continued Operations (Unconstrained)”**

At the direction of VRE, another scenario was explored to identify the resulting operating deficit if VRE continued its existing operating profile and made no deliberate attempt to close the operating gap. Steady State follows the core assumptions assumed in the Ridership Equal Scenario with a key difference - fares increase at the baseline assumption of 3% every other year. The scenario purposely does not achieve fiscal balance, but instead shows the operating deficit that VRE would incur should system operations continue as currently performed and growth with the region does not occur.

<b>Steady State Scenario Summary and Key Metrics:</b>	
Daily Trips (FY16 / FY40)	19,200 / 19,200
Daily Trains (FY16 / FY40)	32 / 32
Total Operating Costs (FY/16 / FY40)	\$81.8 / \$145 million

<sup>2</sup> Status of funding was determined by an assessment of readily available, applied for, or expected funds that could be used toward VRE’s planned capital investments. Funded projects have dedicated sources, such as formula funds that come directly to VRE that are reasonably expected to be available for use to pay for intended investments. Potentially funded sources are anticipated or identified funding sources that are not dedicated or readily available for use, such as discretionary grants or investments by other stakeholders in major projects such as the Long Bridge project. Unfunded capital costs represent the cost of projects that require an identified and secured funding source for which one did not exist at the time of the assessment.

Additional Operating Need (Annual)	\$20.3 million
Fare Box Recovery Ratio (FY16 / FY40)	52% / 39%
Fare (FY16 / FY40) in FY16 \$	7.90 / 11.26
Total Capital Investment	\$2.6 billion
Unfunded Capital Investment	<b>\$506 million / \$20.2 million annually</b>

Like other scenarios where fares are increased at a rate of 3% every other year, in FY40 fares would reach \$11.26 on average per trip (FY16 dollars) as compared to the average fare of \$7.90 in FY16. Under this scenario the resulting average annual additional operating need is \$20.3 million over the 25-year planning period.

Capital investment required for this scenario is unchanged from Ridership Equal where needed investments total \$2.6 billion over the 25-year horizon, of which approximately \$506 million (or an average annual capital need of \$20.3 million over the 25-year horizon) remains unfunded.

Primary drivers of unfunded capital investment in this scenario include the purchase of replacement rolling stock and the completion of the contractually obligated Long Bridge project.

**Key Takeaways for the Steady State Scenario:**

- Steady State reveals the operating deficit VRE would incur should it continue its operations as they exist today without deliberate action to achieve fiscal balance.
- Average additional annual revenue needed is \$20.3 million over the 25-year planning period
- VRE ridership would remain at approximately 19,200 daily trips from FY16 to FY40 and VRE would not grow with its market.
- Capital requirements total \$2.6 billion and approximately \$506 million (or an average annual capital need of \$20.3 million over the 25-year horizon) remains unfunded.
- Unfunded projects are primarily related to the Long Bridge project, and the replacement of rolling stock.

**Natural Growth Scenario – “Grows with Base Market”**

The Natural Growth scenario allows VRE to continue to serve its base market and enhance services in response to the “natural” population and employment growth in the region. Ridership under this scenario would grow from 19,200 average daily riders to 31,100 in FY40. The Natural Growth scenario assumes fares would increase at a rate of 3% every other year resulting in an overall fare increase from the average VRE fare of \$7.90 in FY16 to \$11.26 in FY40 (FY16 dollars).

<b>Natural Growth Scenario Summary and Key Metrics:</b>	
Daily Trips (FY16 / FY40)	19,200 / 31,100
Daily Trains (FY16 / FY40)	32 / 32
Total Operating Costs	\$81.8 / \$152 million
Additional Operating Need (Annual)	\$9.3 million
Fare Box Recovery Ratio (FY16 / FY40)	52% / 59%
Fare (FY16 / FY40) in FY16 \$	7.90 / 11.26
Total Capital Investment	\$3.2 billion
Unfunded Capital Investment	<b>\$871 million / \$34.8 million annually</b>

VRE would achieve this level of service by lengthening trains and platforms, and expanding parking and rail yards. Existing peak, reverse peak, and midday travel options would remain and no additional trains would be placed in service as a result of the contemplated Natural Growth enhancements.<sup>3</sup> This scenario does not achieve fiscal balance of operating revenues and expenses and requires an average annual additional operating need of \$9.3 million over the 25-year horizon.

Like previous scenarios, in addition to operating needs, Natural Growth requires capital investment. Approximately \$3.2 billion in capital investment is required for this scenario, of which approximately \$806 million is funded, \$1.5 billion is assumed to be available from potential sources, and \$871 million remains unfunded. Averaged over the 25-year planning period, VRE would require \$34.8 million per year to fund its unfunded capital needs. Capital requirements for this scenario are primarily driven by track and signal costs, completion of the Long Bridge project, stations and parking, and rolling stock investments.

**Key Takeaways for the Natural Growth Scenario:**

- VRE would continue to serve its base market and the service “natural” growth in the region
- VRE ridership would grow from 19,200 daily riders to 31,100 daily riders.
- Total number of trains remains at 32 peak-oriented trips per day, however ridership levels would increase due to capacity added through the lengthening of trains
- There is an average additional annual operating need of \$9.3 million over the 25-year horizon to pay for escalating operating expenses.
- Capital requirements of \$3.2 billion are required of which \$871 million (or an average annual capital need of \$34.8 million over the 25-year horizon) remains unfunded.

**Modified Service – “Limited Expansion”**

The Modified Service Expansion scenario builds off the Natural Growth scenario and reflects some enhancements contemplated in VRE’s System Plan 2040 Vision. Under this scenario VRE would continue to serve its base market and capture “natural” regional growth but VRE would also begin to service new markets, namely those gained from the Gainesville-Haymarket extension.

<b>Modified Service Scenario Summary and Key Metrics:</b>	
Daily Trips (FY16 / FY40)	19,200 / 44,000
Daily Trains (FY16 / FY40)	32 / 64
Total Operating Costs	\$81.8 / \$220 million
Additional Operating Need (Annual)	\$12.4 million
Fare Box Recovery Ratio (FY16 / FY40)	52% / 59%
Fare (FY16 / FY40) in FY16 \$	7.90 / 11.26
Total Capital Investment	\$4.0 billion
Unfunded Capital Investment	<b>\$1.27 billion / \$50.6 million annually</b>

<sup>3</sup> VRE Peak Service is defined as service that runs between the hours of [7:00 AM] to [7:00 PM] Monday through Friday. Reverse Peak service is defined as travel away from the District of Columbia that occurs during defined peak hours of service.

Ridership is expected to grow from the current 19,200 average daily riders in FY16 to 44,000 average daily riders in FY40 due to system expansion. As demand for VRE's service increases over the 25-year planning period the system will introduce additional peak-service on existing routes (resulting in a doubling of the number of daily trains from 32 to 64), limited entry into reverse-peak and off-peak markets, a new Gainesville Haymarket extension, and enhanced service to Manassas and Fredericksburg localities. Fares would increase at a rate of 3% every other year resulting in an overall fare increase from \$7.90 in FY16 to \$11.26 in FY40 (FY16 dollars). With assumed local subsidy also growth of 3% every other year, this scenario forecasts a \$12.4 million average annual additional operating need to achieve financial balance.

Future capital investments required to realize this operational profile total \$4 billion of which approximately \$820 million is funded, \$1.95 billion is assumed to be available from potential sources, and \$1.27 billion remains unfunded. Capital Expenditures consist primarily of new and replacement rolling stock, track and yard expansion investments, the Gainesville-Haymarket extension, Long Bridge, and stations and parking.

Under the Modified Service Expansion profile, system capacity is increased through expansion of travel options including enhanced midday service and reverse peak service, along with added capacity from the Gainesville-Haymarket extension. These enhancements result in approximately 25,000 additional daily riders by FY40, which equates to \$90 million in additional fare revenue in FY40 after 3% fare increases every other year are considered. Though operating and capital costs are substantially higher under this scenario vs. Natural Growth, this scenario has an average annual operating need that is only \$3 million greater than that of Natural Growth. This is primarily due to the additional revenues from increased ridership that defray escalating operating costs and more efficient operations characteristics, such as optimized train frequencies and length, that allow VRE to realize economies of scale.

**Key Takeaways for the Modified Service Expansion Scenario:**

- VRE service would capture the “natural” growth of the region and implement the Gainesville-Haymarket market extension.
- VRE daily ridership would increase by approximately 25,000 riders; growing from 19,200 daily riders to over 44,000 daily riders.
- Enhanced service includes additional peak trains, limited entry into reverse-peak and off-peak markets, and additional service to Manassas and Fredericksburg
- Average additional annual revenue of \$12.4 million is needed per year over the 25-year horizon
- Projected capital requirements total \$4 billion, of which \$1.27 billion (or an average annual capital need of \$50.6 million over the 25-year horizon) remains unfunded.
- Results in additional revenues received due to increased ridership and enhanced operation. These additional revenues help to defray escalating operating costs.

## System Plan 2040 – “Full System Expansion”

This scenario presents the service and operational profile resulting from full entry into reverse-peak and off-peak markets, the addition of the Gainesville-Haymarket/I-66 corridor extension, and the implementation of the Regional Rail service contemplated by System Plan 2040. This scenario fully implements VRE’s vision for System Plan 2040.

<b>System Plan 2040 Scenario Summary and Key Metrics:</b>	
Daily Trips (FY16 / FY40)	19,200 / 52,000
Daily Trains (FY16 / FY40)	32 / 92
Total Operating Costs	\$81.8 / \$257 million
Additional Operating Need (Annual)	\$13.7 million
Fare Box Recovery Ratio (FY16 / FY40)	52% / 58%
Fare (FY16 / FY40) in FY16 \$	7.90 / 11.26
Total Capital Investment	\$4.1 billion
Unfunded Capital Investment	<b>\$1.3 billion / \$52.1 million annually</b>

Ridership is expected to grow from 19,200 average daily riders to 52,000 in FY40 due to system expansions and the implementation of the Gainesville-Haymarket extension. Operational enhancements include full entry into reverse-peak and off-peak service, an increase from 32 to 92 trains, achieving 15-minute peak-oriented train frequencies, construction of the new Gainesville-Haymarket extensions, and enhancing service options to Manassas and Fredericksburg. Fares and local subsidies both grow at the core assumption rate of 3% every other year resulting in an average overall fare increase from \$7.90 in FY16 to \$11.26 in FY40 (FY16 dollars), identical to Natural Growth and Modified System. Accounting for the revenue growth from increases in fares, ridership, and local subsidies, this scenario requires an average annual additional operating need of \$13.7 million over the 25-year planning period.

Future capital requirements under System Plan would also be very similar to the Modified Service Expansion scenario, totaling \$4.1 billion, primarily consisting of major rolling stock and yard expansion investments, the Gainesville-Haymarket extension, Long Bridge, and stations and parking. Of this \$4.1 billion, approximately \$830 million is funded; \$1.95 billion is potentially funded, and \$1.3 billion or an average of \$52.1 million per year remains unfunded.

Like the Modified System Expansion profile, system capacity under the System Plan 2040 scenario is increased through the enhancement of travel options including midday service, use of additional trains, and implementation of the Gainesville-Haymarket extension. These enhancements result in approximately 33,000 additional daily riders by FY40, which equates to \$111 million in additional fare revenue in FY40 after 3% fare increases every other year are considered. This scenario has an average annual operating need of \$13.7, \$1.3 million greater than that of the Modified Service Expansion profile and anticipates serving 8,000 additional daily riders (over Modified Service Expansion) by FY40. These incremental operational efficiencies are gained similarly to the Modified System Expansion and are due to additional revenues from increased ridership that can be used to offset growing operating expenses and enhanced system operations.

**Key Takeaways for the System Plan 2040 Scenario:**

- Represents full implementation of VRE's Vision for System Plan 2040.
- Expanded and enhanced service options allows ridership to grow from 19,200 to 52,000; an increase of approximately 33,000 daily riders.
- Enhancements include the implementation of the Gainesville-Haymarket extension, an increase from 32 to 92 trains, full entry into reverse-peak and off-peak markets, and additional service to Manassas and Fredericksburg.
- Average additional annual revenue of \$13.7 million is needed over the 25-year planning period.
- Projected capital requirements total \$4.1 billion of which \$1.3 billion (or an average annual capital need of \$52.1 million over the 25-year horizon) remains unfunded.

## Debt Financing Alternative

As described, each scenario requires a significant level of capital investment – particularly in the form of rolling stock, track and signal improvements, stations and parking, and system expansions. As an alternative to upfront or pay-as you-go financing, VRE could opt to finance its capital needs through the issuance of debt. Debt financing is commonly used to finance costly long-term capital assets where the benefits of such assets can be transferred to future generations.

This financing mechanism amortizes the cost of an asset over a predefined period of time. It requires periodic payments (principal and interest) over this amortization period that pay down the cost of the financed asset and associated interest and issuance costs. Total financing payments are typically greater than the costs to acquire assets upfront or through other means such as pay-as-you-go financing. This is due to the “cost to borrow” which is inclusive of interest costs, cost of issuance, and other associated fees as required that are in addition to the base cost of the asset. Though total cost is higher, the repayment flexibility of this financing mechanism makes it an affordable and attractive alternative for acquiring capital assets.

VRE anticipates it could use debt to finance new and replacement rolling stock requirements for each scenario. As such, the cost to finance these assets was explored for each alternative. Financed project funds were based on capital costs requirements for proposed new and/or replacement rolling stock purchases. The below table lists anticipated rolling stock requirements, debt costs, and principal amortization periods by alternative.<sup>4</sup>

Scenario	Anticipated Project Fund (\$)	Amortization Period	Fleet Requirement	Average Annual Debt Service (AADS) (\$)	Aggregate AADS (\$) <sup>5</sup>
Baseline	None	N/A	None	N/A	N/A
Ridership Equal	241 million	FY31 to FY55	Replace	16.6 million	21.2 million
	101 million	FY34 to FY58	Replace	7 million	
Natural Growth	8 million	FY25 to FY49	Expand	571 thousand	22.0 million
	273 million	FY31 to FY55	Expand/Replace	18.8 million	
	149 million	FY35 to FY59	Expand/Replace	10.2 million	32.3 million
	165 million	FY24 to FY48	Expand	11.4 million	
Modified Service	341 million	FY31 to FY55	Expand/Replace	23.4 million	32.3 million
	128 million	FY34 to FY58	Expand/Replace	8.8 million	
System Plan 2040	61 million	FY22 to FY46	Expand	4.2 million	32.3 million
	63 million	FY24 to FY48	Expand	4.3 million	
	405 million	FY31 to FY55	Expand/Replace	27.9 million	
	113 million	FY35 to FY59	Expand/Replace	7.8 million	
	5 million	FY39 to FY63	Expand	384 thousand	
Steady State	241 million	FY31 to FY55	Replace	16.6 million	21.2 million
	101 million	FY34 to FY58	Replace	7 million	

Two considerations must be taken into account when assessing the impact of debt financing rolling stock when compared to the previously identified average annual operating and capital needs.

<sup>4</sup> Issuance Assumptions: 25-year principal amortization; Level debt service; Issuance of par bonds at 5% coupons; Year of issuance is within three (3) years of capital need; Cost per issuance of \$400,000; Underwriters discount of \$5/bond.

<sup>5</sup> For a consistent comparison of aggregate AADS and to remove skewness from combined amortization periods, aggregate AADS was averaged over the first 35 principal amortizations for each scenario.

**The financial forecast groups debt payments in the same category with operating expenses.** The financial analysis groups all outflows into two categories – operating and capital. Because debt payments are an annual ongoing responsibility, they are included in the operating expense category. Therefore, as capital assets are financed through the issuance of debt, the resulting debt payments are then included in as operating expenses and associated capital investment requirements will no longer be counted as a capital need. VRE’s financial policies also require that debt service should not exceed 20% of the total operating budget in any given fiscal year.

**Portions of each assumed amortization period fall outside of the FY16 to FY40 planning period window.** Previously identified projections of average annual capital requirements assumed the total costs of assets would be incurred within the 25-year planning period, without consideration for the year of need. Debt financing takes into account the year of need and principal repayment is assumed to begin the year following issuance. This results in portions of the amortization period(s) falling outside of the 25-year planning period window where debt service would still occur and an additional annual operating need in each scenario would persist. For a fair comparison of operating needs resulting from upfront or pay-as-you-go financing vs. debt financing, the aggregate average annual debt service for the full amortization period must be considered.<sup>65</sup> The table below provides the average annual additional operating need and capital needs with this consideration taken into account.

Scenario	Avg. Ann. Operating Need (\$ M)	With Debt Financing			Without Debt Financing	
		Aggregate Avg. Ann. Debt Service (\$ M)	Resulting Avg. Ann. Capital Need (\$ M)	Total (\$ M)	Total Operating and Capital Need (\$ M)	Difference (\$ M)
Baseline	0	0	0	N/A	N/A	N/A
Ridership Equal	0	21.2	6.5	27.7	20.3	7.4
Steady State	20.3	21.2	6.5	48.0	40.6	7.4
Natural Growth	9.3	22.0	17.6	48.9	44.1	4.8
Modified Service	12.4	32.3	25.2	69.9	63.0	6.9
System Plan 2040	13.7	32.3	26.2	72.2	65.8	6.4

Identified debt need commences upon issuance of rolling stock debt as outlined in the previous table. Needed funds for debt will change should VRE decide to not debt finance all rolling stock purchases as currently assumed.

\$ M - Dollars are in millions

Under each scenario combined average annual operating and capital need is greater when the debt financing option is chosen. This is due to the cost of borrowing and budgeting considerations for long-term debt that extends beyond the 25-year financial planning period. Though costs are slightly higher, this method of financing capital assets provides an affordable alternative to providing upfront or pay-as-you-go payments.

<sup>5</sup> For a consistent comparison of aggregate AADS and to remove skewness from varied lengths of combined amortization periods, aggregate AADS was averaged over the first 35 principal amortizations for each scenario.

## Key Findings and Conclusions

The following key findings were concluded, individually and as a group, from analyses of the varying scenarios and supporting forecasted data.

**Regardless of scenario, operating expenses will escalate and additional revenue will be needed for VRE to achieve fiscal balance over the long term – even assuming a 3% increase to fares and local subsidies every other year.** Whether VRE pursues an expansion of its current service profile or continues existing levels of service, operating expenses will escalate. Even with a multi-year plan for regular, modest fare and local subsidy increases (such as 3% every other year for both sources), additional revenue will be needed for VRE to avoid operating deficits over the 25-year planning period.

On average, VRE operating revenues are expected to grow at a rate of 1% to 4.3% for the various scenarios assessed. This growth in revenues is primarily driven by increased fares coupled with growing ridership and projected local subsidy commitments. Together these sources of funding account for 74% to 80% of total operating revenue in FY40 for the varying scenarios.

VRE Operating Expenses grow at a faster rate than Operating Revenues. On average VRE Operating expenses grow at a rate of 2.4% to 4.9% for the assessed scenarios. In each scenario the compounded rate of growth for operating expenses outpaces the compounded rate of growth for operating revenues. This higher rate of growth is due to contractual obligations that VRE maintains with its operators, additional expenses stemming from expansion of services (for applicable scenarios), and standard industry inflation factors such as AAR (3%) and CPI (2%) applied to expenses as appropriate.

Actual expenses that drive this growth include access fees, contracted train operations, equipment, and facilities maintenance and other expenses (inclusive of fuel costs).

Together these expenses account for 81% to 86% of the total operating expenses in FY40 for the assessed scenarios. This variance in growth between operating expenses and revenues results in annual operating deficits in each scenario, except for Ridership Equal where fares are deliberately increased specifically to achieve fiscal balance for operations.

**Regardless of scenario, VRE has a core level of capital investment that is significant.** While each scenario has a differing level of capital investment, all scenarios have a common universe of capital investment requirements that total \$2.6 billion and must be met over the 25-year planning period from FY16 to FY40. This core capital need is primarily driven by a memorandum of understanding (MOU) between VRE and CSX, which commits VRE to construct a third main track between Washington, D.C. and Fredericksburg (including the expansion of the Long Bridge over the Potomac River). This core investment also includes prioritized capital expenses for state of good repair (maintenance) costs, and the renewal and replacement of rolling stock over the next 20+ years.

VRE is able to fund approximately \$2.1B of the \$2.6 billion, on average, between the various scenarios, using projected federal formula funds and the funds provided by others, including State partners like DRPT.

However, this core amount of capital need cannot be fully defrayed with existing sources of funds alone. As well, capital investment is not solely the responsibility of VRE but it represents total enterprise (system, non-system, and shared) investment that is funded by federal, state, and member jurisdictions in conjunction with VRE contributions.

Moreover, for local jurisdictions, there is a significant imbalance between the capital funds available for members of the Northern Virginia Transportation Authority (NVTa) (i.e. Planning District 8) and those who are not. Currently six (6) of VRE's nine (9) member jurisdictions are also a part of the NVTa. NVTa jurisdictions have access to more diverse and robust revenue streams to fund transit related projects and their VRE jurisdictional subsidies. Such revenue streams are not available to non-NVTa member jurisdictions; this limits their ability to fund non-system and shared projects such as parking and stations improvements. This imbalance could constrain VRE's ability to implement the needed capital investments in non-NVTa jurisdictions and constrains the funds available to the system as a whole.

**Raising fares to close the financial gap is not a viable solution on its own.** The Ridership Equal scenario maintains VRE service and ridership levels as they currently are and achieves fiscal balance by raising fares to close the financial gap. Alone, this solution results in an average fare of \$20.56 incurred in FY40 (in 2016 dollars) vs. a fare of \$11.26 incurred in FY40 (in 2016 dollars) for all other scenarios. The fare increase in other scenarios is based on a more modest growth regimen of 3% every other year. The Ridership Equal scenario also assumes a reduction in ridership due to expectations resulting from the elasticity of demand.

While heightening the level of fare increases eliminates operating deficits, it also drives VRE's fare box recovery ratio to 65%, skews VRE ridership away from those who do not have transit benefits or are otherwise particularly sensitive to fare levels, and would likely change VRE's current ridership demographic. Moreover, VRE has not consistently implemented multiple fare increases over a short period of time as contemplated by the Ridership Equal scenario. In practice, a significant rate increasing regimen could result in even lower ridership than the model's demand elasticity assumption forecasts and could require even higher fares to maintain fiscal balance.

**Higher ridership due to enhanced service levels could defray future operating & capital costs.** As noted in the assessed scenarios, VRE faces escalating costs even under its current operating conditions. The financial forecasts for enhanced service levels in the Modified Service Expansion and System Plan 2040 scenarios illustrate that VRE could realize certain operating economies of scale and generate additional revenue from new ridership.

In each of these scenarios, FY40 fare revenue is projected to increase to levels of \$90 and \$111 million above current FY16 levels, respectively (this increase is due to a fare growth rate of 3% every other year and increases in ridership due to expanded service). This substantial increase in fare

revenue coupled with the increase in local subsidy allows VRE to cover escalating operational expenses with new income generated by the expanded system. As well, the average ratio at which revenues grow compared to expenses in each of these scenarios is higher than those of Ridership Equal and Natural Growth (0.92 as compared to 0.57). This ratio shows that the expanded system which generates additional operating revenue from a growing ridership base better enables VRE to meet its escalating operating expenses than a system profile with no growth.

**VRE needs additional diversified revenue sources beyond the sources which exist today, even if VRE is to maintain the status quo, with VRE dedicated funding as an important component of that new revenue.** Each of VRE's existing sources of revenue has limitations. State and federal sources of funds are outside of VRE's direct control and are subject to a wide range of influencing factors. Local subsidies are limited by individual jurisdictions' ability to pay, and the need to balance local budgets with many competing priorities. Lastly, fares are driven by market factors, and demand is elastic.

A reliable and predictable revenue stream is needed to balance a forecast of known escalating costs tied to contractual obligations with VRE's operators. Additional revenue is also needed to fund significant unfunded portions of capital projects necessary to maintain, replace, and/or expand VRE's capital assets to ensure an optimal state of good repair and operating profile for the system. A reliable and predictable revenue stream for both operating and capital expenses would permit VRE to be financially sustainable over the long term.

## Next Steps

This strategic financial forecasting tool and analysis has provided VRE with valuable information for use in formulating its long-term vision of enhanced system operations, expansion of services and fiscal balance. VRE recognizes that under any scenario, there is a requirement for additional operating revenue and significant capital investment. As a result of this and other findings as described, VRE proposes a strategic direction predicated on the following two pillars:

- ❖ VRE will continue to follow the Natural Growth profile of providing additional service through lengthening of existing trains in response to ridership growth over time due to regional increases in population and employment.
- ❖ VRE will continue to pursue funding to implement the service concepts included in the System Plan 2040 profile such as additional peak trains; the Gainesville-Haymarket extension and reverse-peak and off-peak service.

VRE will work with local and state partners on the development of a financing strategy to fund needed capital investment and fill operating gaps to accomplish its strategic vision. A key part of developing a balanced financial plan will entail the identification and evaluation of new and potential revenue streams beyond those that VRE employs today.

Immediate next steps include working in collaboration with the Commonwealth Transportation Board (CTB) and the Virginia Department of Rail and Public Transportation (DRPT). VRE anticipates that the CTB will conduct a review and analysis of the key in this report along with the supporting data in an effort to validate VRE's funding needs and lay the groundwork for the identification of reliable and sustainable funding sources that support VRE's fiscal stability and growth toward its vision set forth in System Plan 2040.