



MASON & MASON
CAPITAL RESERVE ANALYSTS, INC.



Condition Assessment
&
Reserve Fund Plan Update
2020
Wood Wren

Burke, Virginia



Prepared for:
The Board of Trustees
Burke Centre Conservancy



MASON & MASON
CAPITAL RESERVE ANALYSTS, INC.



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March 31, 2020

Mr. Bob Bray, Finance Administrator
Burke Centre Conservancy
6060 Burke Centre Parkway
Burke, Virginia 22015-3702

RE: **CONDITION ASSESSMENT AND RESERVE FUND PLAN UPDATE 2020**
Wood Wren Cluster
Burke, Virginia
Project No. 8903#34

Dear Mr. Bray:

Mason & Mason Capital Reserve Analysts, Inc. has completed the report for Wood Wren.

As outlined in our proposal, the report is being submitted to you and the Board of Directors for review and comment. A review of the Summary of Key Issues iii, and Sections 1 and 2 will provide you with our findings and financial analyses.

We genuinely appreciate the opportunity to work with you and the Cluster.

Sincerely,

Mason & Mason Capital Reserve Analysts, Inc.

Levi K. Mason, R. S.
Vice President

James G. Mason, R. S.
Principal



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FOREWORD

PLEASE READ THIS FIRST

This report contains information the Board requires to fulfill its fiduciary responsibilities with respect to the financial health of the Association. Even if you are already familiar with the concepts of capital reserve planning, it requires some study. The information in this report is vital to your Association's financial health. Unless you understand it, your Association may not follow it. This may lead to underfunding and financial stress at some time in the future.

Our years of experience providing reserve analysis to both first-time and multi-update return clients have compelled us to develop a logical funding approach, which is based on generational equity and fairness to common-interest property owners that helps ensure realistic reserve funding levels.

Our approach is neither standard, nor is it necessarily easy to understand without first becoming familiar with some basic concepts. Section 3 explains these concepts in more detail. We want you to understand them because a well-informed Association makes the best decisions for its common-property owners.

SUMMARY OF KEY ISSUES

Different readers will look for different things from this report. Perhaps the homeowner will just be looking for the high points. A prospective buyer may be looking at the general financial condition of the Association's reserves. A Board member should probe deeper in order to understand the financial tools that will be helpful in fulfilling their fiduciary responsibilities to the Association.

The Summary of Key Issues presents a recapitulation of the most important findings of Wood Wren Cluster's Reserve Fund Plan Update. Each is discussed in greater detail in the body of the report. We encourage the reader to "go deeper" into the report, and we have written it in a way that's understandable to a first-time reader.

Analyzing the capital reserves reveals that:

- The reserve fund is **fully funded** through 2019. Our goal is to maintain fully funded status through the end of the 20-year period (2039).

To maintain fully funded status, the Board should:

- Reduce the annual contribution in **2021** from **\$9,761** to **\$9,003**, followed by annual adjustments of **1.0%** thereafter.
 - This represents a reduction from **\$21.98** to **\$20.28** (a net reduction of **\$1.70**) per residence, per month (based on **37** Townhomes).
-

VISUAL EVALUATION METHODOLOGY

The first step in the process is collection of specific data on each of your community's commonly-held components. This information includes quantity and condition of each included component. We collect most of this data during the on-site field survey. When this information is not available in the field, we may obtain it by discussion with those knowledgeable through management or service activities.

The field survey or condition assessment is visual and non-invasive. We don't perform destructive testing to uncover hidden conditions; perform operational testing of mechanical, electrical, plumbing, fire and life safety protection; or perform code compliance analysis.

We make no warranty that every defect has been identified. Our scope of work doesn't include an evaluation of moisture penetration, mold, indoor air quality, or other environmental issues. While we may identify safety hazards observed during the course of the field survey, this report shouldn't be considered a safety evaluation of components.

Replacement costs are sometimes based on published references, such as R. S. Means. However, our opinions of replacement costs usually include removal and disposal and are usually based on experience with similar projects including information provided by local contractors and reported client experience. Actual construction costs can vary significantly due to seasonal considerations, material availability, labor, economy of scale, and other factors beyond our control.

Projected useful service lives are based on statistical data and our opinion of their current visual condition. No guarantee of component service life expectancies are expressed or implied and none should be inferred by this report. Your actual experience in replacing components may differ significantly from the projections in the report, because of conditions beyond our control or that were not visually apparent at the time of the survey.

1. INTRODUCTION

1.1 Background: Wood Wren Cluster is comprised of 37 townhomes within eight buildings located on Wood Wren Court off Starboard Drive just north of Guinea Road in Burke, Virginia. The cluster was constructed in 1977. The street layout includes concrete sidewalks, concrete steps, curbs and gutters, and thirteen parking bays providing 75 spaces. Site features include guide rails and a storm water drainage system.

We are providing the Condition Assessment and Reserve Fund Plan Update based on Proposal Acceptance Agreement No. 8903#34 dated October 9, 2019. Our services are subject to all terms and conditions specified therein.

Mason & Mason did not review the declarations, covenants, or other organization documents pertaining to the establishment and governance of the Cluster. Ultimately, the establishment, management, and expenditure of reserves are within the discretion of the Cluster and its Board of Directors pursuant to their organizational documents and subject to the laws of the applicable jurisdiction. We are not financially associated with Burke Centre Conservancy Management or the Cluster, and therefore do not have any conflicts of interest that would bias this report. Information provided by Management is deemed reliable. This report is not intended to be an audit or a forensic investigation. This report is not a mandate, but is intended to be a guide for future planning.

Mason & Mason provided a Level I Condition Assessment and Reserve Fund Plan for Wood Wren Cluster in 2006, and Level II Updates in 2010 and 2015. This report is an additional Level II Update and includes a new condition assessment. All common components were visually observed. Measurements and quantities were generally accepted from the previous report except where changes have occurred. The update report is a stand-alone document and reference to the previous report should not be necessary.

Levi K. Mason R. S. and Eva Pastalkova, Ph.D., Analyst conducted the field evaluation for this report on March 17, 2020. The sky was partially overcast, and the temperature was approximately 64 degrees F. Light precipitation occurred the night before the site visit. The pavements and grounds dry and generally clean of debris.

1.2 Principal Findings: The common assets appear to be in overall fair to poor condition. We observed extensive quantities of deflective, transverse and lateral linear cracking throughout the driveways and parking bays of the community. We did not see any evidence that the full-depth repairs, which are essential to achieving a full service life of the asphalt, were performed in 2019, as originally scheduled. As a result, we have scheduled a near-term restoration project of the asphalt pavement.

The concrete sidewalks, curbs, and gutters are generally in good condition. We observed approximately 360 s.f. of defective concrete. Among others, we observed some settled and heaved concrete panels, which formed potential tripping hazards. The liability and costs associated with personal injury lawsuits resulting primarily from sidewalk and curb tripping hazards are too great to defer repair. It is our opinion that deficiencies, which pose a hazard to pedestrians should be corrected as soon as practicable. Thus, we have scheduled near-term repair of these deficiencies.

The guide rails appear to be in poor condition, and we have scheduled their near-term replacement.

The pricing provided by Management indicates that moderate price reductions have occurred since 2015 resulting in a slightly lower than projected level of contribution. Currently the reserve fund appears to be fully funded for the current cycle and the contributions should be slightly lowered to address generational equity issues, while maintaining fully funded status long-term. The Association has adequate reserve funding and should be proactive in making the necessary common component repairs and replacements.

In order to maintain the physical attributes that preserve property values and provide a safe environment for occupants and guests, a series of capital expenditures should be anticipated. Consequently, we have scheduled near-, mid-, and late-term restoration and replacement projects based on anticipated need from our experience with similar properties.

Generally, our approach is to group appropriately related component replacement items into projects. This creates a more realistic model and allows a grouping timeline that is more convenient to schedule and logical to accomplish. Please see the Table 1 Discussion, Column 18, and the Asphalt Pavement Report in Section 7, for specific information.

2. FINANCIAL ANALYSIS

We track the annual inflation rate among our clients based on their reported costs for typical services. The average rate of inflation since the 2008 recession has been 1.46% according to the U.S. Labor Department, and is similar in our experience with clients. Substantially higher inflation rates have not materialized since then. So, we are using a 2% annual rate of inflation in our calculations. Interest income has also remained low since 2008, and many smaller Associations and Condominiums are earning less than 2% on savings accounts. So, we are using a 1.5% interest income rate of return in our calculations. However, unlike reserves, interest income is taxable, which may reduce the net gain even further. We anticipate increasingly volatile economic conditions near to mid-term. It is prudent to keep a close watch on the economy and be ready to respond by updating the reserve fund plan as economic changes dictate.

2.1 Calculation Basics: The Cluster is on a calendar fiscal year. Management reported that the audited reserve fund balance, including cash and securities, as of **December 31, 2019**, was **\$90,608**. We have used **2.00%** annual inflation and **1.50%** annual interest income in our calculations. The total expenditures for the twenty-year period for both the **Cash Flow Method** and **Component Method** are projected to be **\$186,134**.

2.2 Current Funding Analysis, Cash Flow Method (Table 3): The 2020 annual contribution to reserves has been set at **\$9,761** with a presumed **2.0%** annual increase. At this level, the total for all annual contributions for the twenty-year period would be **\$237,167**, and the total interest income is projected to be **\$29,441**. **This funding results in unnecessarily high balances throughout the twenty-year period and over funds the reserves.**

2.3 Alternative Funding Analysis, Cash Flow Method, Hybrid Approach (Table 3.1): This plan provides the annual contributions necessary to maintain balances more consistent with the **fully funded goal by reducing the annual contribution to \$9,003 in 2021 and providing a 1% annual adjustment thereafter**. This plan allows for a **gradual increase over time after the initial reduction, and addresses generational equity issues**. The total for all annual contributions for the twenty-year period would be **\$197,118**, and the total interest income is projected to be **\$24,491**. **The fully funded balance in 2039 is \$126,083.**

2.4 Funding Analysis, Component Method (Table 4): This method of funding would require variable annual contributions, averaging **\$9,979** over the twenty-year period. The total for all annual contributions would be **\$199,589**, and the total interest income is projected to be **\$22,020**. **The fully funded balance in 2039 is \$126,083.** The Component Method model considers the current reserve fund balance in computing individual component contributions for current cycles.

3. METHODS OF FUNDING

Once the data are compiled, our proprietary software produces two distinct funding methods. These are the **Component Method** and **Cash Flow Method**. Each of these methods is used in analyzing your Association's reserve status and each plays a role in the Board's decision on how to fund reserves. While we provide the guidance, the choice of funding method is ultimately the prerogative of the Board. Considering the vulnerability of the Association's assets, its risk tolerance, and its ability to fund contributions, the Board should decide how the Association will fund its reserves and at what level.

3.1 Component Method: As reserve analysts, we recognize the value of Component Method calculations as they address both future replacement costs and the time remaining to fund them. **This is the foundation of the savings concept. You will see the term "fully funded."** This simply means you are on schedule, in any given year, to accrue sufficient funds by the component's replacement date. It does not mean you must have 100% of the funds ahead of time. Simplified Example: A component projected to cost \$1,000 at the end of its 10-year life cycle would require a \$100 annual contribution in each of the 10 years. As long as you follow this contribution plan, the component is "fully funded."

Prior to determining the actual required annual contribution, a complex calculation apportions the existing reserve fund to each component. Each component's remaining unfunded balance forms the basis for the required contribution going forward.

Funds set aside for replacement of individual components are not normally used for the replacement of other components, even though the funds reside in the same bank account. In rare cases where a reserve fund is actually overfunded, \$0 will be displayed on the Component Method tables, indicating that the component is fully funded for that cycle.

While the time basis for the report is a 20-year period, the Component Method allows for inclusion of long-life components that may require replacement after the specified period. **This allows for funding of long-life components contemporaneously, which is fundamentally fair if they are serving the current owners. This is in contrast to saying, "if it doesn't require replacement within our 20-year period, we're going to ignore it."**

Due to replacement cycle time and cost differentials, the Component Method typically results in annual contribution fluctuations, which often makes it difficult for a Board to implement. **However, its guidance is essential and invaluable for understanding funding liabilities and making informed recommendations.** Table 4 shows these calculations, as well as projects interest income, expenses with inflation, and yearly balances, which will be "fully funded."

3.2 Cash Flow Method: The Cash Flow Method is easier to implement. It is a simple 20-year spread sheet that includes the starting balance, current contribution, interest income, inflation rate, projected expenses, and resulting yearly balances. The Cash Flow Method pools the contributions allocated to each of the Association's common components into a single "account."

Table 3 shows these calculations. This table reflects the information you provided on your reserve fund balance and current contribution. It also shows projected yearly positive or negative balances. **The Cash Flow Method doesn't include replacement funding for anything beyond the 20-year period, thus leaving a potential shortfall in funding and failing to address generational equity if not specifically set to do so.** It doesn't provide any real guidance beyond the basic information. There are several variations on cash flow goals such as Threshold Funding (just enough to stay positive) and Percentage Funding (a predetermined level based on some arbitrary percentage), but these schemes don't address the reality of fully funding, and typically are just a way of passing the obligation on to the next generation.

3.3 Hybrid Approach: Please note that this is not a method, rather a way (approach) for us to utilize the Cash Flow Method, while ensuring the appropriate funding levels are achieved long-term. Our Hybrid Approach uses the projected fully funded balance at the end of the 20-year period from Table 4 as a funding goal. We then set up Cash Flow funding plans. Table 3 is your "where we are now" Cash Flow spreadsheet modeling your reserve balance and current contribution. Table 3.1 (and possibly others) provides alternative(s) to this that meet the fully funded goal from Table 4.

We usually establish a new Cash Flow contribution that requires only small annual inflationary increases to reach the fully funded goal at the end of the 20-year period. This has the added effect of establishing a funding plan that addresses inflation. The contribution in the first year, adjusted for inflation, is equal to the contribution in the last year, based on inflated dollars (future value of money). This approach will also allow underfunded Associations the time to catch up, mitigating undue hardships. It balances the risk of temporary underfunding with the benefit of consistent predictable increasing contributions. The combination of the Component and Cash Flow Methods (Hybrid Approach) provides the advantages of both methods.

4. RESERVE PROGRAMMING

The Mason & Mason proprietary software used to produce the financial tables (Tables 1 through 4) have been under continual refinement for over a decade. It is unique in the industry as it provides comprehensive modeling through Microsoft Access and Excel that addresses the many challenges of reserve funding, allows analysts and clients to run "what if" scenarios, provides an easy to understand matrix of views and functions, and is easily provided to clients through e-mail.

4.1 Interest Income on Reserve Funds: Most Associations invest at least part of their reserve funds. Small Associations may simply use a savings account or certificates of deposit, while large Associations may have multiple investments with short-, medium-, and long-term instruments. One issue that is difficult to quantify is the percentage of funds invested. Some Associations invest a fairly substantial portion, while others hold back due to current cash outflow obligations. Some Associations do not reinvest the investment proceeds in their reserves; rather they divert the cash into their operations fund. We do not agree with this approach as it has the effect of requiring additional reserve contributions to make up for the difference. There is also the issue of changing rates over the 20-year period. In the recent past we have seen large swings in relatively short time periods. While reserve funds are not usually taxable by the IRS, the investment income generated by the reserve fund is taxable in most

situations. Even with all these potential pitfalls, investment income still represents a substantial source of additional funds and for this reason should not be ignored. There is no way to make “one size fits all” with any accuracy for the individual Association. Our approach to this dilemma is to use lower approximations that compensate for less than 100% of funds invested. We feel this is still better than not recognizing it, and periodic updates allow for adjustments based on experience. The rate can be set at any level, including zero, for Associations desiring to not recognize interest. **The rate should reflect, as accurately as possible, the actual composite rate of return on all securities and other instruments of investment including allowances for taxes.**

The interest income displayed on Table 3 and Table 4 is the summation of the beginning reserve fund interest accrual and the interest earned on the contributions minus the interest lost by withdrawing the capital expenditures. This method of calculation, while not exact, approximates the averages of the three principal components of a reserve fund for each twelve-month period.

4.2 Future Replacement Costs (Inflation): Inflation is a fact of life. In order to replicate future financial conditions as accurately as possible, inflation on replacement costs should be recognized. The financial tables have been programmed to calculate inflation based upon a pre-determined rate. This rate can be set at any level, including zero. **A plan that doesn't include inflation is a 1-year plan, and any data beyond that first year won't reflect reality.**

4.3 Simultaneous Funding: This is a method of calculating funding for multiple replacement cycles of a single component over a period of time from the same starting date. Simple Example: Funding for a re-roofing project, while, at the same time, funding for a second, subsequent re-roofing project. This method serves a special purpose if multiple-phase projects are all near-term, but will result in higher annual contribution requirements and leads to generational equity issues otherwise. We use this type of programming only in special circumstances.

4.4 Sequential Funding: This is a method of calculating funding for multiple replacement cycles of a single component over a period of time where each funding cycle begins when the previous cycle ends. Simple Example: Funding for the second re-roofing project begins after the completion of the initial re-roofing project. This method of funding appears to be fundamentally equitable. We use this type of programming except in special circumstances.

4.5 Normal Replacement: Components are scheduled for complete replacement at the end of their useful service lives. Simple Example: An entrance sign is generally replaced all at once.

4.6 Cyclic Replacement: Components are replaced in stages over a period of time. Simple Example: Deficient sidewalk panels are typically replaced individually as a small percentage, rather than the complete system.

4.7 Minor Components: A minimum component value is usually established for inclusion in the reserve fund. Components of insignificant value in relation to the scale of the Association shouldn't be included and should be deferred to the operations budget. A small Association might exclude components with aggregate values less than \$1,000, while a large Association might exclude components with aggregate values of less than \$10,000. Including many small components tends to over complicate the plan and doesn't provide any relative value or utility.

4.8 Long Life Components: Almost all Associations have some components with long or very long useful service lives typically ranging between thirty and sixty years. Traditionally, this type of component has been ignored completely. Simple Example: Single replacement components such as entrance monuments should be programmed for full replacement at their statistical service life. This allows for all common property owners to pay their fair share during the time the component serves them. This also has the added effect of reducing the funding burden significantly as it is carried over many years.

4.9 Projected Useful Service Life: Useful service lives of components are established using construction industry standards and our local experience as a guideline. Useful service lives can vary greatly due to initial quality and installation, inappropriate materials, maintenance practices or lack thereof, environment, parts attrition, and obsolescence. By visual observation, the projected useful service life may be shortened or extended due to the present condition. The projected useful service life is not a mandate, but a guideline, for anticipating when a component will require replacement and how many years remain to fund it.

4.10 Generational Equity: As the term applies to reserves, it is the state of fairness between and over the generations relating to responsibility for assets you are utilizing during your time of ownership. It is neither reasonable, nor good business to defer current liabilities to future owners. This practice is not only unfair; it can also have a very negative impact on future property values.

5. UPDATING THE RESERVE FUND PLAN

A reserve fund plan should be periodically updated to remain a viable planning tool. Changing financial conditions and widely varying aging patterns of components dictate that revisions should be undertaken periodically from one to five years, depending upon the complexity of the common assets and the age of the community. Weather, which is unpredictable, plays a large part in the aging process.

Full Updates (Level II) include a site visit to observe current conditions. These updates include adjustments to the component inventory, replacement schedules, annual contributions, balances, replacement costs, inflation rates, and interest income.

We encourage Associations that are undergoing multiple simultaneous or sequential costly restoration projects (usually high rise buildings) to perform Level III Administrative Updates. Administrative updates do not include a condition assessment. They are accomplished by comparing original projections with actual experience during the interim period as reported by Management. These updates can be performed annually and include adjustments to the replacement schedules, contributions, balances, replacement costs, inflation rates, and interest income. The Level III Administrative Update can be a cost-effective way of keeping current between Level II Full Update cycles. Full Updates (Level II) and Administrative Updates (Level III) help to ensure the integrity of the reserve fund plan.

6. PREVENTIVE MAINTENANCE

The following preventive maintenance practices are suggested to assist the Association in the development of a routine maintenance program. The recommendations are not to be considered the only maintenance required, but should be included in an overall program. The development of a maintenance checklist and an annual condition survey will help extend the useful service lives of the Association's assets.

This section includes best maintenance practices or life-extension maintenance for many, but not necessarily all, components in the report. Items for which no maintenance is necessary, appropriate or beyond the purview of this report are not included in this section. We typically include them for townhomes and garden condominiums while mid- and high-rise buildings are generally too complex.

6.1 Asphalt Pavement: Pavement maintenance is the routine work performed to keep a pavement, subjected to normal traffic and the ordinary forces of nature, as close as possible to its as-constructed condition. Asphalt overlays may be used to correct both surface deficiencies and structural deficiencies. Surface deficiencies in asphalt pavement usually are corrected by thin resurfacing, but structural deficiencies require overlays designed on factors such as pavement properties and traffic loading. Any needed full-depth repairs and crack filling should be accomplished prior to overlaying. The edgemoil and overlay process includes milling the edges of the pavement at the concrete gutter and feathering the depth of cut toward the center of the drive lane. Milling around meter heads and utility features is sometimes required. The typical useful life for an asphalt overlay is twenty years.

6.2 Asphalt Seal Coating: The purpose is to seal and add new life to a roadway surface. It protects the existing pavement but does not add significant structural strength. A surface treatment can range from a single, light application of emulsified asphalt as a "fog" seal, to a multiple-surface course made up of alternate applications of asphalt and fine aggregate. Seal coating of all asphalt pavements should be performed at approximately six-year intervals, or approximately twice during the service life of the asphalt pavement. Seal coating more often is generally not cost-effective. The material used should be impervious to petroleum products and should be applied after crack filling, oil-spot cleaning, and full-depth repairs have been accomplished. Seal coating is a cost-effective way of extending the life of asphalt concrete pavement. Seal coating is generally not scheduled for up to five years after an asphalt restoration project.

6.3 Asphalt Full-Depth Repairs: In areas where significant alligator cracking, potholes, or deflection of the pavement surface develops, the existing asphalt surface should be removed to the stone base course and the pavement section replaced with new asphalt. Generally, this type of failure is directly associated with the strength of the base course. When the pavement is first constructed, the stone base consists of a specific grain size distribution that provides strength and rigidity to the pavement section. Over time, the stone base course can become contaminated with fine-grained soil particles from the supporting soils beneath the base course. The most positive repair to such an area is to remove the contaminated base course and replace it with new base stone to the design depth. It is appropriate to perform these types of repairs immediately prior to asphalt restoration projects. Generally, this type of repair should not be required for approximately five years after an asphalt restoration project.

6.4 Asphalt Crack Filling: Cracks that develop throughout the life of the asphalt should be thoroughly cleaned of plant growth and debris (lanced) and then filled with a rubberized asphalt crack sealant. If the crack surfaces are not properly prepared, the sealant will not adhere. Crack filling should be accomplished every three to six years to prevent infiltration of water through the asphalt into the sub-grade, causing damage to the road base. It is appropriate to perform these types of repairs immediately prior to edgemoil and overlay. Generally, this type of repair should not be required for approximately five years after an edgemoil and overlay project.

6.5 Concrete Sidewalks: When sidewalks are cracked or scaled or sections have settled, the resulting differential or "tripping hazard" can present a liability problem for the Association if personal injury should occur as a result. Tripping hazards should be repaired expeditiously to promote safety and prevent liability problems for the community. Generally, where practical and appropriate, concrete element repairs and replacements are scheduled in the same years to promote cost efficiencies. Replacements are usually scheduled in cycles because the necessity of full replacement at one time is unlikely. Typically, damaged or differentially settled sections can be removed by saw cutting or jack hammer and re-cast. Concrete milling of the differential surfaces is sometimes an appropriate, cost-effective alternative to re-casting. Skim coating is not an effective repair for scaled or settled concrete surfaces and, over time, will usually worsen the problem. The use of ice melting chemicals may accelerate deterioration of concrete components.

6.6 Concrete Curbs and Gutters: Vehicle impacts, differential settlement, construction damage, and cracking and spalling of the concrete will eventually result in the need for replacement of some curb sections. A typical damaged or settled section, usually 10 feet in length, will be removed by saw cutting or jack hammer and re-cast.

6.7 Concrete Steps: Concrete steps should be replaced when cracking, deterioration, or settlement occurs. Cracks, which occur at the intersection of treads and risers, should be filled with an appropriate sealant to prevent water infiltration.

7. ASPHALT PAVEMENT REPORT

Street Name	Total SY Asphalt Pavement	SY Full- Depth Repairs	Linear Footage Cracks	Parking Spaces	Parking Bays
Wood Wren Court	4,905	M&R	M&R	75	13
TOTALS	4,905	M&R	M&R	75	13

All quantities approximate

M&R: Mill and replacement restoration recommended

COMPONENT DATA AND ASSET REPLACEMENT SCHEDULE

TABLE 1 EXPLANATION

This table lists the common assets included in the reserve fund plan and provides details of the replacement schedules. A narrative discussion is provided adjacent to each component. Photo references and maintenance protocol reference numbers are also provided. An explanation of each column in the table follows:

Column 1	Component No. is consistent throughout all tables.
Column 2	Component is a brief description of the component.
Column 3	Quantity of the component studied, which may be an exact number, a rough estimate, or simply a (1) if the expenditure forecast is a lump sum allowance for replacement of an unquantified component.
Column 4	Unit of Measurement used to quantify the component: <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> SY = Square Yards SF = Square Feet LF = Linear Feet EA = Each LS = Lump Sum PR = Pair CY = Cubic Yards </div>
Column 5	Unit Cost used to calculate the required expenditure. This unit cost includes removal of existing components and installation of new components, including materials, labor, and overhead and profit for the contractor.
Column 6	Total Asset Base is the total value of common assets included in the study in current dollars. In addition to capital assets, this figure includes one cycle of maintenance liability.
Column 7	Typical Service Life (Yrs) or Cycle is the typical life expectancy of similar components in average conditions or the length of years between replacement cycles, and does not necessarily reflect the conditions observed during the field evaluation. This number is furnished for reference and is not necessarily computed in the system.
Column 8	1st Cycle Year is the scheduled year of the first projected replacement or repair.
Column 9	Percentage of Replacement is the percentage of component value to be replaced in the first replacement cycle.
Column 10	Cost for 1st Cycle is the future cost (with inflation) of the replacement. It is the product of Column 6 times Column 9 in future dollars.
Column 11	2nd Cycle Year is the scheduled year of the second projected replacement or repair. If a second cycle is not listed, it is because the first cycle is beyond the end of the study.
Column 12	Percentage of Replacement is the percentage of component value to be replaced in the second replacement cycle. This can vary from the percentage of the first cycle for various reasons, such as the increased age of a component may require a larger amount of repair.
Columns 13 Through 16	Cycles, Percentage, and Cost repeat as itemized above. Although not shown on the tables, the cycles continue throughout the study period and beyond.
Column 18	Discussion is the description and observed condition of the component and the methodology employed in the decision-making process. Includes the photo reference, (Photo #1, #2, etc.) and Maintenance Protocol reference numbers (7.1, 7.2 etc.) if applicable.

Reserve Fund Plan for
34. WOOD WREN CLUSTER
Burke, Virginia

COMPONENT DATA AND
ASSET REPLACEMENT SCHEDULE
TABLE 1
2020 Through 2039



The cells within these Excel spreadsheets contain proprietary code and are intended only for the client and its management. Unauthorized use of the formulae for other clients or other purposes is strictly forbidden and will be considered piracy.

Component No.	Component	Quantity	Unit of Measurement	Unit Cost	Total Asset Base	Typical Service or Cycle Life in Yrs	1st Cycle Year	Percentage of Replacement	Cost For 1st Cycle	2nd Cycle Year	Percentage of Replacement	Cost For 2nd Cycle	3rd Cycle Year	Percentage of Replacement	Cost For 3rd Cycle	DISCUSSION
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18
1 ASPHALT COMPONENTS																
1.1	Asphalt Restoration Project	4,905	SY	\$10.00	\$49,050	18	2023	100%	\$52,052	2041	100%	\$74,343				The asphalt pavement throughout the community appears to be in generally poor condition as evidenced by extensive defective, transverse and lateral cracking throughout the asphalt drivelaness and parking bays of the Cluster. We did not observed any full-depth repairs throughout the asphalt, and its condition suggests that it is nearing the end of its service life. Due to the observed condition, we have scheduled a near-term full mill and replace restoration. The thickness of the pavement could not be visually determined. Restoration includes full-width milling to a depth of 2" and new compacted asphalt. Core sampling should be used to determine the depth and condition of the sub-base and pavement prior to restoration. Costs do not include replacement of any inadequate sub-base. A full service life is dependent on Preventive maintenance being performed as suggested in Preventive Maintenance section of the report and scheduled in Items 1.2 and 1.3 below. See the Asphalt Pavement Report, Section 7, for additional details.
1.2	Asphalt Seal Coat	4,905	SY	\$1.05	\$5,150	6	2029	100%	\$6,155	2035	100%	\$6,932	2047	100%	\$8,791	The drivelaness and parking bays appear to have been seal coated recently. Seal coating may help prevent water infiltration into the sub-base through micro cracks, but is largely a cosmetic issue. To help improve curb appeal after repairs, we have scheduled seal coating projects every six years, except in the year of the pavement restoration project when it is not necessary. Crack filling and full-depth repairs should be completed prior to application to achieve maximum benefit from the seal coating. Seal coating projects include re-striping. It should be understood that coal-tar based seal coating products have been banned from use in many localities throughout the country due to heavy contamination of ground water.
1.3	Asphalt Full-Depth Repair & Crack Fill Allowance	1	LS	\$20,506.00	\$20,506	6	2023	100%	\$21,761	2029	25%	\$6,127	2035	50%	\$13,799	We observed wide area failure and significant transverse and lateral cracking throughout the drivelaness and parking bays. While the all asphalt surfaces were recently crack filled, we did not observe any evidence of full-depth repairs having been performed. Additionally, we observed that several locations of severely deflected asphalt, which should have been properly addressed, instead had a "gridwork" of crack filling applied over the surface. It is our opinion that this is a largely ineffective treatment and funds would be better spent repairing the sub-base failure. Due to the condition of the asphalt, we have not scheduled any further repairs prior to restoration as it is unlikely that repairing the asphalt will significantly extend its service life. Post restoration, repairs are essential in order to achieve the projected remaining service life of the pavement. Full-depth repairs and crack filling are scheduled progressively every six years throughout the study period, including the year of the asphalt restoration project.
2 CONCRETE COMPONENTS																
2.1	Concrete Sidewalks & Steps	6,474	SF	\$10.00	\$64,740	5	2020	6%	\$3,884	2025	3%	\$2,144	2030	3%	\$2,368	Concrete sidewalks throughout the Cluster are generally 4' or 6' wide. The thickness of the concrete could not be visually determined. The condition of the sidewalks ranges from good to fair. We observed approximately 360 square feet of deficient concrete. Many sections are settled at curbs or between sections causing tripping hazards, some sections are cracked, and some areas have scaled surfaces. We have not scheduled replacement of sections with lesser surface defects. About 3% of sections can be expected to fail in a typical 5-year period. More severely distressed sections should be repaired in the first cycle. Minor surface defects may not justify replacement. Sidewalk restoration is scheduled to coincide with other concrete work to take advantage of economies of scale. The Board should be aware that repairs to small quantities of concrete may be more costly because of the difficulty of attracting competitive bids for small projects, which may not meet contractor minimums. Uneven surfaces may be a tripping hazard, and any safety issues require immediate attention. Any settlement or surface-defect trip hazards should be repaired as soon as observed to prevent personal injury.
2.2	Concrete Curbs & Gutters	3,028	LF	\$26.50	\$80,242	5	2020	1%	\$802	2025	2%	\$1,772	2030	2%	\$1,956	The drivelaness and parking bays are lined with standard-profile, cast-in-place, concrete curbs. The curbs are generally in good condition with only a few minor transverse cracks and a few settled sections observed. We observed 2 damaged sections, which should be replaced. As curbs age, cracks, vehicle impact damage, and settlement should be anticipated. About 2% of curb and gutter sections can normally be expected to fail in a typical 5-year period. Minor chips usually do not justify replacement. Cyclic repairs are scheduled because full replacement is seldom required. Curb and gutter restoration is scheduled to coincide with other concrete work to take advantage of economies of scale. The Board should be aware that repairs to small quantities of concrete may be more costly because of the difficulty of attracting competitive bids for small projects, which may not meet contractor minimums. Any settlement or surface-defect trip hazards should be repaired as soon as observed to prevent personal injury.
3 SITE FEATURES																
3.1	Guide Rails	187	LF	\$41.40	\$7,742	35	2020	100%	\$7,742	2055	100%	\$15,483				Four sections of traffic guide rails are constructed adjacent to Wood Wren Court to guard against vehicles leaving Wood Wren Court and landing in the adjacent Guinea Road traffic. We observed significantly deteriorated posts and some loose components. The guide rails appear to have achieved a full service life and have been scheduled for near-term replacement.
3.2	Storm Water Drainage System Allowance	1	LS	\$10,080.00	\$10,080	5	2022	100%	\$10,487	2027	100%	\$11,579	2032	100%	\$12,784	Storm water drainage is provided by concrete yard drains, curb drop inlets, and underground structures. All observable components appear to be in good condition. Some settlement was observed adjacent to storm water structures, which may indicate a lack of backfill compaction during construction. Though storm water drainage systems are a long life component and catastrophic failure is not anticipated, it is prudent to plan for localized repairs and repairs to ancillary damage as the system ages. This category may also be used to address localized erosion issues. This line item addresses potential storm water collection, drainage, and erosion issues throughout the study period and does not represent a single expense or action already identified as necessary.
4 ENGINEERING																
4.1	Cyclic Updates	1	LS	\$1,050.00	\$1,050	5	2020	100%	\$1,050	2025	100%	\$1,159	2030	100%	\$1,280	At the direction of Management, we have included an allowance to cover the cost of future updates, which are performed on a five-year basis.

CALENDAR OF EXPENDITURES TABLE 2 EXPLANATION

This table is a yearly plan of action of replacements and costs. A description of the columns in the table follows:

- Column 1 **Year** is the year of the projected replacement and expenditure.
- Column 2 **Component No.** itemizes the components and is consistent throughout the tables.
- Column 3 **Component** is a brief description of the component.
- Column 4 **Present Cost** is the cost for the cycle in today's dollars.
- Column 5 **Future Cost (Inflated)** is the cost for the cycle in future dollars.
- Column 6 **Total Annual Expenditures** gives the total expenditures by year.
- Column 7 **Action** is an area provided for the Board to make notations as to action taken on each component.

Reserve Fund Plan for
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CALENDAR OF EXPENDITURES
TABLE 2
2020 Through 2039



YEAR	COMPONENT NO.	COMPONENT	PRESENT COST 2020	FUTURE COST (INFLATED)	TOTAL ANNUAL EXPENDITURES	ACTION
1	2	3	4	5	6	7
2020					2020	
	2.1	Concrete Sidewalks & Steps	\$3,884	\$3,884	TOTAL EXPENDITURES	
	2.2	Concrete Curbs & Gutters	\$802	\$802		
	3.1	Guide Rails	\$7,742	\$7,742		
	4.1	Cyclic Updates	\$1,050	\$1,050		
					\$13,479	
2021					2021	
					NO EXPENDITURES	
2022					2022	
	3.2	Storm Water Drainage System Allowance	\$10,080	\$10,487	TOTAL EXPENDITURES	
					\$10,487	
2023					2023	
	1.1	Asphalt Restoration Project	\$49,050	\$52,052	TOTAL EXPENDITURES	
	1.3	Asphalt Full-Depth Repair & Crack Fill Allowance	\$20,506	\$21,761		
					\$73,813	
2024					2024	
					NO EXPENDITURES	
2025					2025	
	2.1	Concrete Sidewalks & Steps	\$1,942	\$2,144	TOTAL EXPENDITURES	
	2.2	Concrete Curbs & Gutters	\$1,605	\$1,772		
	4.1	Cyclic Updates	\$1,050	\$1,159		
					\$5,076	
2026					2026	
					NO EXPENDITURES	
2027					2027	
	3.2	Storm Water Drainage System Allowance	\$10,080	\$11,579	TOTAL EXPENDITURES	
					\$11,579	
2028					2028	
					NO EXPENDITURES	
2029					2029	
	1.2	Asphalt Seal Coat	\$5,150	\$6,155	TOTAL EXPENDITURES	
	1.3	Asphalt Full-Depth Repair & Crack Fill Allowance	\$5,127	\$6,127		
					\$12,282	
2030					2030	
	2.1	Concrete Sidewalks & Steps	\$1,942	\$2,368	TOTAL EXPENDITURES	
	2.2	Concrete Curbs & Gutters	\$1,605	\$1,956		
	4.1	Cyclic Updates	\$1,050	\$1,280		
					\$5,604	
2031					2031	
					NO EXPENDITURES	
2032					2032	
	3.2	Storm Water Drainage System Allowance	\$10,080	\$12,784	TOTAL EXPENDITURES	
					\$12,784	
2033					2033	
					NO EXPENDITURES	
2034					2034	
					NO EXPENDITURES	
2035					2035	
	1.2	Asphalt Seal Coat	\$5,150	\$6,932	TOTAL EXPENDITURES	
	1.3	Asphalt Full-Depth Repair & Crack Fill Allowance	\$10,253	\$13,799		
	2.1	Concrete Sidewalks & Steps	\$1,942	\$2,614		
	2.2	Concrete Curbs & Gutters	\$1,605	\$2,160		

Reserve Fund Plan for
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CALENDAR OF EXPENDITURES
TABLE 2
2020 Through 2039

YEAR	COMPONENT NO.	COMPONENT	PRESENT COST 2020	FUTURE COST (INFLATED)	TOTAL ANNUAL EXPENDITURES	ACTION
1	2	3	4	5	6	7
	4.1	Cyclic Updates	\$1,050	\$1,413	\$26,918	
2036					2036	
					NO EXPENDITURES	
2037					2037	
	3.2	Storm Water Drainage System Allowance	\$10,080	\$14,114	TOTAL EXPENDITURES	
					\$14,114	
2038					2038	
					NO EXPENDITURES	
2039					2039	
					NO EXPENDITURES	

CURRENT FUNDING ANALYSIS CASH FLOW METHOD

TABLE 3.0 EXPLANATION

and, if applicable,

ALTERNATIVE FUNDING ANALYSIS CASH FLOW METHOD

TABLE 3.1, 3.2, 3.3 (etc.) EXPLANATION

Table 3.0 shows the financial picture over the twenty-year study period, using the current annual contribution and the reserve fund balance reported at the beginning of the study year. If the results of the study indicate a need to increase the annual contribution to maintain adequate balances throughout the study period, Table 3.1, and possibly, 3.2 will be provided for consideration. Alternatives might also be provided if a community is over-funded and desires to adjust the annual contribution downward.

Alternative funding may be achieved by increasing the annual contribution to a fixed yearly amount or by applying an annual escalation factor to increase contributions over time, or a combination of both methods. An inflation factor and interest income factor may be included in the calculations on this page.

A description of the columns in the table follows:

Column 1	Year
Column 2	Total Asset Base of all common capital assets included in the reserve fund with costs adjusted for inflation.
Column 3	Beginning Reserve Fund Balance is the reserve fund balance after all activity in the prior year is completed.
Column 4	Annual Contribution , on Table 3, is the amount contributed annually to the reserve fund as reported by the Board of Directors. On the Alternative Funding Analysis tables (3.1, 3.2, etc.), the annual contribution is projected to maintain positive balances throughout the study period.
Column 5	Interest Income , which is indicated in the heading of the table, is applied to the reserve fund balance and is accrued monthly throughout each year after the yearly expenditures are deducted. The interest income percentage may be varied to reflect actual experience of the community investments.
Column 6	Capital Expenditures are annual totals of expenditures for each year of the study period adjusted by the inflation percentage listed in the heading of the table.
Column 7	Ending Reserve Fund Balance is the result of the beginning reserve fund balance plus the annual contribution, plus interest income, less capital expenditures for the year.
Column 8	Balance to Asset Base Ratio , expressed as a percentage, is the ratio between the ending reserve fund balance and the total asset base for that year. The ratio is useful to the analysts in understanding general financial condition, but there is no standard ratio as each community's condition and complexity varies.

Reserve Fund Plan for
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CURRENT FUNDING ANALYSIS
CASH FLOW METHOD
TABLE 3



Beginning Reserve Fund Balance: **90,608** Annual Contribution To Reserves: **9,761** Contribution Percentage Increase: **2.00%** Annual Inflation Factor: **2.00%** Annual Interest Income Factor: **1.50%**

In Dollars

YEAR	TOTAL ASSET BASE	BEGINNING RESERVE FUND BALANCE	ANNUAL CONTRIBUTION	INTEREST INCOME	CAPITAL EXPENDITURES	ENDING RESERVE FUND BALANCE
1	2	3	4	5	6	7
2020	238,560	90,608	9,761	1,338	13,478	88,229
2021	243,331	88,229	9,956	1,414	0	99,599
2022	248,198	99,599	10,155	1,502	10,487	100,770
2023	253,162	100,770	10,358	1,005	73,813	38,320
2024	258,225	38,320	10,566	665	0	49,551
2025	263,390	49,551	10,777	795	5,075	56,048
2026	268,657	56,048	10,992	936	0	67,977
2027	274,031	67,977	11,212	1,024	11,579	68,634
2028	279,511	68,634	11,437	1,130	0	81,201
2029	285,101	81,201	11,665	1,222	12,282	81,806
2030	290,803	81,806	11,899	1,287	5,604	89,387
2031	296,619	89,387	12,137	1,449	0	102,973
2032	302,552	102,973	12,379	1,552	12,784	104,120
2033	308,603	104,120	12,627	1,676	0	118,423
2034	314,775	118,423	12,879	1,894	0	133,196
2035	321,070	133,196	13,137	1,900	26,918	121,315
2036	327,492	121,315	13,400	1,942	0	136,656
2037	334,042	136,656	13,668	2,061	14,114	138,271
2038	340,722	138,271	13,941	2,202	0	154,414
2039	347,537	154,414	14,220	2,448	0	171,082
STUDY PERIOD TOTALS			237,167	29,441	186,134	

Reserve Fund Plan for
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ALTERNATIVE FUNDING ANALYSIS
CASH FLOW METHOD
HYBRID APPROACH
TABLE 3.1



Beginning Reserve Fund Balance: **90,608** Annual Contribution To Reserves: **9,761** Contribution Percentage Increase: **1.00%** Annual Inflation Factor: **2.00%** Annual Interest Income Factor: **1.50%**

In Dollars						
YEAR	TOTAL ASSET BASE	BEGINNING RESERVE FUND BALANCE	ANNUAL CONTRIBUTION	INTEREST INCOME	CAPITAL EXPENDITURES	ENDING RESERVE FUND BALANCE
1	2	3	4	5	6	7
2020	238,560	90,608	9,761	1,338	13,478	88,229
2021	243,331	88,229	9,003	1,406	0	98,638
2022	248,198	98,638	9,093	1,479	10,487	98,723
2023	253,162	98,723	9,184	965	73,813	35,059
2024	258,225	35,059	9,276	605	0	44,939
2025	263,390	44,939	9,368	714	5,075	49,947
2026	268,657	49,947	9,462	832	0	60,240
2027	274,031	60,240	9,557	894	11,579	59,112
2028	279,511	59,112	9,652	972	0	69,735
2029	285,101	69,735	9,749	1,033	12,282	68,235
2030	290,803	68,235	9,846	1,065	5,604	73,543
2031	296,619	73,543	9,945	1,192	0	84,679
2032	302,552	84,679	10,044	1,257	12,784	83,196
2033	308,603	83,196	10,145	1,339	0	94,680
2034	314,775	94,680	10,246	1,514	0	106,440
2035	321,070	106,440	10,349	1,473	26,918	91,343
2036	327,492	91,343	10,452	1,465	0	103,260
2037	334,042	103,260	10,557	1,531	14,114	101,234
2038	340,722	101,234	10,662	1,616	0	113,512
2039	347,537	113,512	10,769	1,802	0	126,083
STUDY PERIOD TOTALS			197,118	24,491	186,134	FULLY FUNDED BALANCE GOAL

FUNDING ANALYSIS COMPONENT METHOD

TABLE 4 EXPLANATION

Table 4 is a yearly list of annual contributions toward each component, which must be made to achieve 100% funding. The reserve fund balance is the balance at the beginning of the study year. The beginning reserve fund balance is applied, proportionately, to each component prior to calculating the yearly contribution for each component. Future costs (inflation) are factored into the replacement cycles. The annual contribution for each year is calculated in the bottom row of the study labeled **Annual Component Contribution Totals**. Interest and inflation are calculated at the same annual rates as the Cash Flow Method (Table 3).

Column 1	Component Number is consistent throughout the tables.
Column 2	Component is a brief description of the component.
Columns 3 - 22	Years lists the annual contribution amount toward each component throughout the twenty-year study period, which is totaled at the bottom of the component table.

COMPONENT METHOD SUMMARY

The component method summary computes the beginning reserve fund balance, the annual component contribution, the annual expenditures, and interest income. It then provides the ending reserve fund balance for each year of the study.

Reserve Fund Plan for
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FUNDING ANALYSIS
COMPONENT METHOD
TABLE 4



Beginning Reserve Fund Balance:

In Dollars **90,608**

Component Number	COMPONENT	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
1 ASPHALT COMPONENTS																					
1.1	Asphalt Restoration Project	1,531	1,531	1,531	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596	3,596
1.2	Asphalt Seal Coat	58	58	58	58	58	58	58	58	58	1,103	1,103	1,103	1,103	1,103	1,103	668	668	668	668	668
1.3	Asphalt Full-Depth Repair & Crack Fill Allow	640	640	640	975	975	975	975	975	975	2,197	2,197	2,197	2,197	2,197	2,197	4,947	4,947	4,947	4,947	4,947
2 CONCRETE COMPONENTS																					
2.1	Concrete Sidewalks & Steps	761	413	413	413	413	456	456	456	456	456	503	503	503	503	503	555	555	555	555	555
2.2	Concrete Curbs & Gutters	413	341	341	341	341	377	377	377	377	377	416	416	416	416	416	459	459	459	459	459
3 SITE FEATURES																					
3.1	Guide Rails	1,030	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336	336
3.2	Storm Water Drainage System Allowance	466	466	2,229	2,229	2,229	2,229	2,229	2,461	2,461	2,461	2,461	2,461	2,717	2,717	2,717	2,717	2,717	2,999	2,999	2,999
4 ENGINEERING																					
4.1	Cyclic Updates	317	223	223	223	223	246	246	246	246	246	272	272	272	272	272	300	300	300	300	300
ANNUAL COMPONENT CONTRIBUTION TOTALS		5,216	4,008	5,771	8,171	8,171	8,273	8,273	8,505	8,505	10,772	10,884	10,884	11,140	11,140	11,140	13,578	13,578	13,860	13,860	13,860

COMPONENT METHOD SUMMARY	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
BEGINNING RESERVE FUND BALANCE	90,608	83,757	89,063	85,739	21,459	30,021	33,739	42,590	40,228	49,410	48,734	54,839	66,641	66,094	78,323	90,737	78,878	93,758	95,034	110,442
PLUS ANNUAL COMPONENT CONTRIBUTION	5,216	4,008	5,771	8,171	8,171	8,273	8,273	8,505	8,505	10,772	10,884	10,884	11,140	11,140	11,140	13,578	13,578	13,860	13,860	13,860
CAPITAL EXPENDITURES	13,478	0	10,487	73,813	0	5,075	0	11,579	0	12,282	5,604	0	12,784	0	0	26,918	0	14,114	0	0
SUBTOTAL	82,346	87,765	84,347	20,097	29,630	33,219	42,012	39,516	48,733	47,900	54,014	65,723	64,997	77,234	89,463	77,397	92,456	93,504	108,894	124,302
PLUS INTEREST INCOME @ 1.50%	1,411	1,298	1,392	1,362	391	521	577	713	677	834	825	917	1,097	1,089	1,274	1,481	1,302	1,529	1,548	1,781
FULLY FUNDED RESERVE FUND BALANCE	83,757	89,063	85,739	21,459	30,021	33,739	42,590	40,228	49,410	48,734	54,839	66,641	66,094	78,323	90,737	78,878	93,758	95,034	110,442	126,083

PERCENT FUNDED FOR CURRENT CYCLE	138%
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TOTAL EXPENDITURES	186,134
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TOTAL CONTRIBUTIONS	199,589
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STUDY PERIOD TOTAL INTEREST	22,020
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AVERAGE ANNUAL CONTRIBUTION	9,979
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