Developing Cash Reserve Policies

A GUIDE FOR WATER AND WASTEWATER UTILITIES

AND OTHER
INFRASTRUCTURE-BASED
ORGANIZATIONS

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Developing Cash Reserves Policies

A white paper exploring the effective use of cash reserves towards sustainable and resilient financial management of infrastructure-based utilities

This white paper has these parts:

Part I – introduction
Part II – context and considerations
Part III – the different types of cash reserves
Part IV – pulling it all together
Part V- worksheets

Part I – Introduction

Cash reserves are funds that are set aside for varying purposes. They form a critical component of the financial sustainability and resiliency of organizations. They are a time-tested risk mitigation strategy that demonstrates a willingness to be prudent stewards of the systems that form the foundations of infrastructure-based services delivered by municipal governments and private sector utilities. Water and wastewater utilities should establish formal and/or informal policies relating to reserves (AWWA 2018).

This paper assumes that you are already in agreement that your organization would likely benefit from cash reserve policies and you are now looking to drill down into specifics and the "how" of it. For those readers wanting a broader context around this topic, a longer discourse on the merits and challenges of setting up cash reserves can be found here: https://waterworth.net/2019/09/05/the-importance-of-cash-reserves/.

Some of what follows is based on fact and consensus while some is based on experience and opinion. We welcome all viewpoints on these topics, in the interest of developing a sound and widely accepted consensus.

Although this paper is written from the perspective and experience in water and wastewater utilities management, the concepts and recommended practices apply to any organization operating an infrastructure-based business.

Part II - Context and Considerations

Reserve requirements and policies will vary greatly across different industries and across different organizations within an industry based on many factors and considerations. Each utility is different, and policies must align with the organization's objectives. This section establishes some vocabulary, concepts and context and discusses factors and considerations that are more general to the topic of cash reserves and that may influence specific implementations of individual cash reserve policies.

The next section, Part III, identifies and presents eight types of reserves, each in their own self-contained *reserves sheets* that can be used to facilitate discussion. Each of these reserves sheets describes the purpose of the reserve, a method and rationale for calculating a target balance, and some specific considerations, including how to maintain those funds.

Operating vs. Capital Reserves

Cash reserves will be grouped into two broad categories: operating and capital. Cash from a capital reserve is generally used to purchase property, equipment or infrastructure with a useful life of greater than one year and that are capitalized in the financial statements. Cash from operating reserves, on the other hand, can cover a variety of short-term expenses.

What Are Reserves Really Doing for You?

Let's break this down into three archetypes, meaning, three kinds of purposes for reserves. Later, in Part III, eight specific types of reserves are described, and the purpose of each of those can be identified as one of the following 3 archetypes.

Cash Flow Management

Typically called working capital, this is more of a chequing account than a reserve fund. It can be seen as a "float" meant to buffer cash flow issues that arise over the weeks and months of a year when payables are due but new income has not yet been received. Although this is more of a chequing account than a reserve fund, a working capital policy will establish a minimum reserve level that is to be maintained from year to year.

Risk Management

Cash reserves also serve as a form of insurance against contingencies, enabling an organization to respond to unplanned expenditures or revenue shortfalls. This type of reserve fund serves to absorb unforeseen costs, thereby insulating rate payers from otherwise sudden and excessive rate hikes to deal with the contingency. Examples of reserves of this type include operating contingency, emergency capital, debt service reserve, and rate stabilization reserve.

Saving Up for Something

Cash reserves are also a way to save up cash to pay for all or a portion of a future capital expense. They may for example serve as a general purpose buffer to address year-to-year cash flow issues (much like working capital does for month-to-month cash flow issues); or they may be setup to finance all or a portion of specifically identified small and/or large capital projects occurring in the near and/or the long term.

Restricted vs. Unrestricted

Reserve funds may be set up as a restricted or unrestricted fund. A restricted fund has specific criteria outlining authorized use of the funds, and often includes a mechanism sometimes involving a third party to authorize access to the funds. An unrestricted reserve, as its name suggests, contains funds with no (or very little) strings attached.

There may at times be legal requirements that dictate whether a reserve fund must be restricted. These requirements vary from one jurisdiction to the next and should be thoroughly understood when setting out to establish reserve policies. Even when restrictions are not imposed by statute, formal policies may apply restrictions to the use of reserves to ensure they can only be used for the specific purposes for which they were intended. Defining such policies will depend on your organizations priorities and objectives.

Unrestricted reserves can be accessed more easily and provide the organization with more operating flexibility. Policies and procedures should still be established and clearly communicated with regards to the appropriate uses, access, and funding of unrestricted reserves. These policies will ensure your reserves remain adequately funded and available for their intended purposes, while providing enough flexibility to handle crisis situations.

Credit Ratings and Bond Requirements

Unrestricted operating reserves are a key factor that analysts use in determining a utility's bond rating. Simply put, healthier operating reserves = a better credit rating = lower interest rates (Standard and Poor's 2002).

Bond covenants will typically require establishment of a debt service reserve to ensure the creditor that payments to service the debt would not be interrupted even in the event of some contingency affecting revenues or cash flow. Bond covenants also may require minimum levels of operating reserves that must be maintained separate from, and in addition to, debt service reserves.

Insurance Requirements

Some insurance policies may require the utility to maintain a reserve fund for emergency expenses – to either cover those expenses outright whenever possible to avoid the need to file a claim, or to cover the deductible in the event a claim is necessary.

System Size

Smaller utilities typically don't gain the same benefits from economies of scale the way larger utilities do and may therefore need a proportionately higher level of operating reserves, due to the greater impact caused by volatile revenues, fluctuating usage, and emergency expenses.

System Age

Older systems will have an increased risk of unplanned, emergency repairs resulting from infrastructure failure. Older systems may be defined as systems with an infrastructure backlog¹ that is relatively significant and potentially growing. The older the system, the bigger the risk, perhaps warranting higher levels of reserve targets.

¹ Infrastructure backlog refers to infrastructure components that have exceeded their theoretical service lives, yet are still in service.

Pooling Reserves Together

There are two ways to interpret the idea of pooling: that reserve targets be pooled together or that reserve funds be pooled together.

Normally, you would identify separate targets for each relevant type of reserve and allocate funds for each of those targets such that each reserve has its own independent funds. However, the availability of other types of reserves may impact your overall operating reserves objectives. For example, if you already have a significant Working Capital account, then a lower Contingency Reserve amount might be acceptable. Or, having a large Contingency Reserve may be sufficient to satisfy a loan covenant. This leads to the idea of pooling reserve targets.

The idea of pooling reserves targets means that instead of allocating separate funds, the funds allocated may overlap across 2 or more reserves. In other words, if reserve #1 has a target of \$1m and reserve #2 has a target of \$500k, pooling those targets means that a single multipurpose reserve of \$1m is established which can cover either the needs of reserves #1 or #2. Doing this may save some money but it implies that both reserves would not be required at the same time. In general, however, using a reserve fund to provide coverage for several purposes may increase the risk that the fund may be insufficient if it is required for several purposes all at once.

On the other hand, pooling of reserve funds means that the funds for the reserves are all held together in one account, possibly an interest-bearing account. And there may be an advantage, perhaps a higher rate of interest earned, if that account has a higher balance. However, when pooling reserve funds, to continue with the example above, the account would contain both amounts required by reserves #1 and #2, that is, \$1.5m, so that at any time, both reserves can serve their purpose if the circumstance arises.

Using Cash or Debt for Large Projects?

When deciding whether to establish a cash reserve as a way of saving for future projects, consider the community's position on the use of debt financing. Communities that prefer to finance big projects with cash alone will need to build up more reserves than communities that make use of debt financing, whether in whole or in part.

You'll need to consider the acceptable mix of cash and debt for funding capital. Communities that have historically relied on debt financing in the past should look to the future to see if they will be capable of continuing to use debt financing at the same level. A growing infrastructure deficit, for example, may substantially increase the amount of future capital spending requirements. A community that relies heavily on debt financing may find itself over-leveraged, unable to maintain the minimum *debt service coverage ratio*² typically required by lenders. To avoid that situation, a community should start building up a cash reserve to help partially or wholly fund those future projects.

See the pending white paper on Funding Future Infrastructure and Intergenerational Equity for some guidance on how to work through this topic.

² The Debt Service Coverage (DSC) ratio is the margin of safety ratio associated with bonded indebtedness reflecting the ratio of the actual or projected net revenue available for debt service to annual debt-service payments. It is calculated by expressing net revenue (total recurring operating revenue less total recurring operating expenses) as a percentage of debt-service costs.

Long Range Financial Planning

Organizations that most capably articulate a sound reserves plan maintain a robust long-term financial planning practice (Grant Thornton 2013). Such a practice facilitates exploring various scenarios while trying to determine an optimal mix of cash and debt for funding large projects. Long-term planning that looks 20+ years into the future allows planners to see the impacts of a growing asset renewal backlog, the need for the eventual replacement of long-lived big-ticket items, and the effects of saving up (or not) for funding those large future projects.

Setting up Reserve Funds

The implementation of the reserve fund will vary depending on the type of reserve, the date of expected need and any formal investment policies established by the organization. The reserve may be held in the daily operating accounts of the organization, as is the case for working capital, or a reserve may be a segregated account with restricted access. Liquidity and the preservation of principal are important factors in determining the types of funds to hold. Lowrisk cash equivalents such as money market accounts, treasury bills, commercial papers, and short-term government bonds may earn a small return on investment while the funds are set aside in the reserve. Any investment that restricts access to the funds must mature before the expected date of need.

Controls

When establishing a reserve policy, the roles and responsibilities for the management and use of the reserves should be communicated and well understood throughout the organization. A decision-making process on the types and funding targets of reserve must be established. Appropriate strategies and processes must be developed for the investment of reserves. Procedures and documentation on when and how to access reserve accounts should be established. In addition, standard internal control such as separation of duties, and access controls should be in place.

Timeline for Funding Reserve Targets

Once target levels for reserves have been established, you will need to consider the time frame for fulfilling those targets. Ideally those reserve funds are set up immediately however it could take several years to achieve the targets, taking into consideration both the impacts to rate payers and how aggressively elected officials wish to pursue those targets. Development and maintenance of a long-term financial model becomes critical in managing this.

Part III – The Types of Cash Reserves

Now that we've reviewed some more general considerations around the topic of cash reserves, let's look at the specifics. The pages that follow contain descriptions of each type of cash reserve, the typical uses, methods for calculating a target balance for the reserve, and some additional considerations specific to that type of reserve.

Working Capital

Manage Short Term Cash Flow Issues

This reserve can be referred to as a "float", an amount of cash whose main or only purpose is to provide a buffer for the week-to-week and month-to-month cash flow swings that arise from timing differences between receipt of revenue from rate payers and paying obligations on time. A water utility, for example, may get a large proportion of its revenues during the summer, coinciding with outdoor water use. Yet, that utility may have large expenses during the months leading up to the summer and thus experiencing an operating loss during those early months which are covered by the cash in the working capital account.

This cash will play a role during the transactions that occur during the year, but it is typically replenished by year's end. So, in a long-term financial plan, the cash position should never drop below this amount; otherwise, that would imply that you would be starting a new year with less than the required working capital.

Target Balance

- Organizations should maintain at minimum two months (60 days) of working capital, higher for smaller organizations, and lower for larger ones (GFOA 2019).
- Can be based on a percentage of annual operating expenses; setting policy at 25%, for example, would establish enough working capital to be able to cover 90 days of expenses without any new revenues.
- Setting as a percentage rather than a fixed amount allows the target to grow over time as operating expenses grow with inflation.

Type of Funds to Hold

 Typically, these funds would be a balance in the operating account and noted as cash in the financial statements.

- How often do you bill customers? The longer the duration between billings, the more
 working capital is needed. Organizations that bill only once per year will need more
 working capital than those that bill monthly.
- Are month-to-month expenses consistent?
- Do you have seasonal variations in either? If so, then perhaps base the size of the reserve on the month(s) in which operating expenses are largest.
- Do you use the Working Capital to cash flow capital expenditures? If so, then should the target balance allow for capital expenses too? Or will you manage capital spending cash flow issues using a different reserve fund dedicated to capital expenses?

Operating Contingency Reserve

Insurance Against Unforeseen Expenses

Operating Contingency reserves are intended for quick response to emergencies and to cover unplanned operating expenses for which the timing cannot be controlled. Examples include but are not limited to the sudden need to activate a boil water notice, the need to cover unexpected legal proceedings, expenditures related to significant storm events, or a major work-related accident.

Recommended Practice 4.1 of the National Advisory Council on State and Local Budgeting states that governments should, "Maintain a prudent level of financial resources to protect against reducing service levels or raising taxes and fees because of temporary revenue shortfalls or unpredicted one-time expenditures" (GFOA 1998).

Target Balance - Calculation

- % of annual operating expenditures
- industry recommendation around 5-10%

Type of Funds to Hold

• Cash and cash equivalents that do not have a penalty for quick access

- What has been the history of unforeseen costs that come up from time to time?
- How much would a boil water notice cost and how long could it last?
- What is the cost of previous storm related expenses?

Debt Service Coverage Reserve

Insurance Against Unforeseen Lack of Cash (Guarantee for Lenders)

Debt Service Coverage reserves are intended to cover debt payment obligations, typically both principal and interest, in the event of a cashflow shortfall. Bond and loan covenants will define the cash reserve parameters, the implementation details and usage restrictions; typically, the covenant will require that the use of those funds be restricted to the debt service of these reserves.

Target Balance - Calculation

- The amount of debt service reserve will be defined in the borrowing agreement.
- A rule of thumb for capital projects is six months worth of principal and interest payments but this will vary on a case by case basis.

Type of Funds to Hold

• Cash and cash equivalents in a restricted account that can be accessed to make up any shortfall in principal and interest payments.

Considerations

 The credit risk of the organization, the size and complexity of the project, and the term length of the loan are some of the factors that will determine the size of the reserve account.

Revenue Shortfall Reserve

Insurance Against Revenue Volatility

Revenue Shortfall reserves (may also be called Rate Stabilization, Revenue Volatility) are intended to insulate the rate payers from a revenue shortfall significant enough to require large rate increases in order to recover. Factors that could cause such a shortfall might include: economic downturn causing large customers to shut down; a colder, wetter summer resulting in lower water sales, or; a drought condition combined with severe watering restrictions also leading to lower water sales.

This cash is always in reserve and never planned to be used. It's there in case the unexpected happens. So a long-term financial plan should not show use of these funds.

Target Balance – Calculation

- 5%-20% of annual sale of service revenues
- Analyze and quantify your exposure to potential risks of experiencing a revenue shortfall.
 See Sizing your Reserves: a Risk-Based Approach (GFOA 2013) for a good example of this.

Type of Funds to Hold

Cash and cash equivalents that do not have a penalty for quick access

- What percentage of revenues vary with use? For example, property taxes are 0% variable since landowners pay property taxes regardless of their consumption of any municipal service. Water and wastewater rates on the other hand tend to have a variable component. Some rate structures are 100% variable with no base charges these are the most volatile.
- Are rates going up substantially enough to affect some elastic response to use of the service?
- Are conservation efforts ramping up with anticipation of reducing demand?
- Is climate change causing a tendency towards hotter/drier or colder/wetter summers?
- Have past recessions caused any decreases in revenues?
- Is there a reliance on a small number of large contributors to revenues? If a large percentage of revenue is earned from a single large customer, then the revenue stream may be at some risk if customer shuts down operations.

Emergency Capital Reserves

Insurance Against Unforeseen Capital Expenses

Emergency Capital reserves are intended to enable the quick response to cover unplanned capital expenses to critical infrastructure caused by unforeseen circumstances such as: sudden infrastructure failure or damage caused by a natural disaster such as a hurricane or earthquake.

This reserve may be more important for communities that are carrying an infrastructure backlog. That is, infrastructure that has surpassed its theoretical life and yet is still in service. This infrastructure runs a higher risk of failure. To mitigate against this risk, and until this backlog is reduced by catching up in a planned approach, some percentage of the cost of addressing the backlog could be held in reserve. This percentage could be based on the highest priority assets in the backlog. Completion of a risk and criticality analysis would help weigh the risk of failure and consequence of failure on backlogged infrastructure replacement and in turn can help set this percentage.

Target Balance – Calculation

- Target could be set to an amount equal to historic emergency capital costs incurred
- Target could be set to an amount equal to the largest possible single event emergency replacement that could be anticipated without help from insurance
- Target could be set to a % of infrastructure backlog for which there is no existing plan for replacement

Type of Funds to Hold

• Cash and cash equivalents accessible in a reasonably short manner when large unplanned events occur.

- What are the types of natural disasters and force majeure events possible?
- What would be the potential impacts on critical infrastructure if one of these events were to occur?
- What have been the largest emergency expenditures in the past 10-20 years?
- What would a sudden failure of a plant or major system asset cost to replace?
- How much infrastructure backlog has considerable consequence of failure and considerable likelihood of failure?
- Smaller utilities may need a proportionately larger emergency capital reserve fund to deal with unplanned capital expenditures.

Rehabilitation and Replacement Reserve

Saving up for Near-Term Management of Cash Flow

This reserve serves a similar purpose as working capital but on a longer time scale. Whereas Working Capital helps to manage cash flow issues during the year, this reserve helps to manage cash flow issues that might occur over the course of several years due to the erratic nature of capital expenditures. Having these funds allows the organization to absorb large expenditures while maintaining smoother, more incremental rate increases and improving the flexibility of the organization to balance the use of debt and cash.

This reserve would be used to hold on to annual surpluses for years where those surpluses are not needed. A long-term financial model that includes a comprehensive capital improvement plan would show how much surplus would accumulate in this reserve until it is needed at which point the funds are drawn down. The financial model should show how much surplus is required to accumulate so that when big capital expenses happen, there is just enough cash available in this reserve, perhaps combined with some borrowing, to avoid needing to draw additional cash from other reserves.

Target Balance - Calculation

- The target balance will change over time depending on the peaks and valleys of the capital spending and the use of debt financing and receipt of grants. A long-term financial model is required to show what these balances might be.
- The target balance should be set at a level that ensures use of cash for capital expenditures in the medium term won't draw inappropriately from other reserves.
- Another approach is to accumulate a large enough reserve so that the interest generated could be funding X% of ongoing capital program.

Type of Funds to Hold

• Cash and cash equivalents with most of it quickly accessible and some of it in a cash equivalent investment of medium-term maturity.

- Determining a target level for this reserve is most easily done using a long-term financial model that shows capital expenditures over a medium term and shows how much cash may be needed in the coming 5-10 years to absorb those expenditures while maintaining smooth changes to rates.
- Will you continue to use debt as a source of financing big projects and what is the right mix of cash and debt for funding those projects?
- It is important to communicate to the public that although rates may continue to increase even while there are annual surpluses, those surpluses are being saved away in this reserve and will be used within the next several years.

Equipment Replacement Reserve

Saving up to Replace Stuff with Cash

Equipment Replacement reserves are intended to cover replacement costs for short-lived equipment other than infrastructure, such as vehicles, computers, tools, office and lab equipment, etc. Reserve levels are usually made up of either annual deposits based on depreciation of existing equipment, or on a targeted, minimum balance based on a percentage of the value of that equipment.

Target Balance - Calculation

- Annual deposits might be based on depreciation of existing equipment, or
- A targeted minimum balance might be based on a percentage of the value of that equipment.

Type of Funds to Hold

- Cash and cash equivalents with most of it quickly accessible and some of it in a cash equivalent investment of medium-term maturity.
- In this case, if the replacement cost and time frames are consistent and predictable, then it may be possible to align the investments such that they mature in time to cover the costs of replacements in the year they mature.

- How much can you expect in proceeds from sale of used equipment or vehicles?
- How consistent and periodic are equipment replacement expenditures?
- Can you stagger investments so that you can maximize the rate of return through longer term investments, while assuring that every year, enough of those investments mature in time to cover the expenditures for that year?

Special Purpose / Capacity Expansion Reserve

Long-Term Savings

This type of reserve exists to help organizations save up cash to contribute towards the cost of big infrastructure projects that will be undertaken in the medium or long term. Often these projects are beyond the time horizon of a capital improvement plan and sometimes outside the time frame of a master water plan.

Utilities will often impose special assessments (such as impact fees or developer charges) to fund specific projects related to system expansion or the replacement of specific facilities as necessitated by new construction. Such an assessment will usually have a specific purpose that is defined by statute or local ordinance/resolution. A Special Purpose reserve (usually restricted) is a way to protect those funds, ensuring they will be used solely for the intended purpose, but it's also a way to justify the need for those special assessments.

Utilities may also choose to build up a special purpose reserve to help fund the replacement of large infrastructure in the distant future, say 20-40 years away, for example.

See the pending white paper on Funding Future Infrastructure and Intergenerational Equity for more guidance on how to work through this topic.

Target Balance – Calculation

- Identify future infrastructure funding obligations and determine the organization's
 position on its current responsibility towards funding those future obligations at all, in
 part or in whole.
- Fixed target set at the cost of replacing the assets, less grants & borrowing.
- Worked out through Development Cost Charges / Impact Fee Analysis.

Type of Funds to Hold

• Cash and cash equivalents in a restricted account with a long-term investment horizon that matches the future planning timeline.

- Identify the future large capital projects that fall outside the other funding channels.
- The use of impact fees or developer charges can be used for the reserve funding.
- By establishing this type of reserve, there is a better likelihood of using the funds for the intended purpose.

Part IV – Pulling it All Together

By this point, you're ready to work through a process of getting consensus on the matter of cash reserves and developing policies for moving forward. Note that the conversations around each of the reserve types outlined in Part III will have different levels of complexity and challenge. Instituting a working capital policy for example is going to be far easier than establishing a reserve policy for the replacement of distant future infrastructure.

This section proposes a process that should at least make it manageable, if not easy, to have these conversations.

Initial Steps in Formulating Reserves Policies:

These steps can be undertaken separately for each type of reserve you wish to consider, or any number of them at the same time.

- 1. Start by setting up a long-range financial model. This model should allow you to track reserve levels over the long term, especially to help in the case of establishing rehab and replacement, and/or special purpose future spending reserves³.
- 2. Review and familiarize yourselves with the considerations in Part II.
- 3. Work through each of the reserve types in Part III, one at a time, determining the relevance of each to the organization and how to calculate an appropriate target level.
- 4. Program the reserve target levels into the financial model and explore what rate increases would be required over the coming years to build then maintain a cash position that complies with those target levels.
- 5. Seek informal approval of these policies. If the identified rate increases are approved by council, they implicitly are approving the reserves policies.

Final Steps to Formalize Reserve Policies.

It is appropriate for reserves policies to remain informal, however, if you wish to formalize these policies in a bylaw or council resolution, then consider these additional steps:

- 1. Develop formal policies for each of the reserves you wish to adopt. A set of Cash Reserves Policy Templates is under development and will be available in the future.
- 2. Seek council or board approval for the policies.
- 3. Communicate to the public the rationale behind the reserves, making it clear that the required rate increases support building the reserve towards the agreed upon targets. Organizations that proactively and transparently share financial planning practices are conferring to their rate payers a greater sense of comfort regarding prudent fiscal management.

³ See for example Waterworth.net.

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Part V – Worksheets

Print off the worksheets on the following pages to aid group discussion

Reserve Types	Purpose	Setting Reserve Amount
Working Capital	Float	
Operating Contingency	Insurance	
Debt Service Coverage	Insurance	
Revenue Shortfall	Insurance	

Reserve Types	Purpose	Setting Reserve Amount
Emergency Capital	Insurance	
Rehabilitation & Replacement	Float	
Equipment Replacement	Saving up	
Specified Purpose / Capacity Expansion	Saving up	

Cash Reserves Summary Sheet

Cash Reserves						
Fund	Purpose	Funding Source	Minimum \$ Level	Optimal \$ Level	Balance at	Rationale for Target Level

Cash Reserves Summary Sheet Example

Cash Reserves						
Fund	Purpose	Funding Source	Minimum \$ Level	Optimal \$ Level	Balance at	Rationale for Target Level
Water Operating	For working capital	Any excess water operating fund revenue over expenditures and transfers at the end of each fiscal year	\$200,000	\$400,000	\$	Minimum: 2 months operating expenses Optimal: 4 months operating expenses
Capital rehabilitation and replacement	To fund capital projects not specifically funded from other established Reserves.	 Annual budgeted allocation from operating fund Interest earned on existing funds 	(To be determined during Long Term Financial Planning & Capital Planning process)	(To be determined during Long Term Financial Planning & Capital Planning process)	\$1.6m	Minimum: interest generated is funding 20% of ongoing capital program. Optimum: interest generated is funding 50% of ongoing capital program
Vehicle and Equipment Reserve	To replace vehicles and equipment	 Transfers from operating Interest earned on existing funds Proceeds from the sale of vehicles and equipment 	\$300,000	\$500,000	\$190,000	Minimum funds available to fund upcoming year of vehicle & equipment replacements & to fund all scheduled replacements internally without borrowing