



A Risk-Based Analysis of General Fund Reserve Requirements for the City of Sharonville, Ohio

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Executive Summary

Reserves are the cornerstone of financial flexibility. Reserves provide a government with options for responding to unexpected issues and a buffer against shocks and other forms of risk. Managing reserves, however, can be a challenge. The main question is how much money to maintain in reserve—how much is enough and when does it become too much? This is a sensitive question, since money held in reserves is money taken away from constituents, and it can be argued that excessive reserves should be returned to citizens.

The City of Sharonville, Ohio has been considering this question and engaged GFOA to analyze its reserve requirements based on an assessment of the City's risks compelling it to require a reserve. This report is intended to inform the policy the City might adopt on how much fund balance to retain in its General Fund and Fire Fund as a reserve against risk.

The GFOA analyzed a variety of distinct risk factors to judge their implications for the City's reserve strategy. GFOA then stepped back from the individual risk factors to consider how the risk analysis leads to a coherent overall strategy for managing risks through financial reserves. Below is a review of the risk factors that influenced GFOA's recommendation, and following that is a summary of how GFOA arrived to an overall recommendation for reserves.

Primary Risk Factor - Revenue (Income Tax) Volatility. GFOA's analysis shows that the City experiences monthly income tax revenue variation. From an annual perspective, the income tax revenues are also quite volatile and a significant share of the annual variation is due to random forces.

While the income tax itself is volatile, it is important to review the volatility of the City's entire revenue portfolio. Thus, it is important to ask how income tax, the City's financial risk, and reserves that could be used to mitigate that risk are related. The three are related in two ways: volatility of the City's entire general fund revenue portfolio and some unknowable, unpredictable, yet highly impactful event. These types of have been dubbed "black swan" events in the literature of financial analysis.¹

GFOA reviewed the City's other general fund and fire fund revenues between 2005 and 2013 and also found volatility in these revenue sources. For example, intergovernmental revenue, which is the City's second largest source of general fund revenue at about 7 percent, has increased by as much as 41 percent in a single year and declined by as much as 40 percent. Because 2008 represents the sharpest decline in revenues in both the General Fund and Fire Fund it was used as the basis for recommending a reserve for revenue volatility of \$3.3 million and \$800,000, respectively. The City Budget Office estimates it can reduce the budget without making a severe impact on the City's ability to deliver core services and eliminate capital expenses as well. Given the City's ability to reduce the budget if it was to experience severe financial difficulty, a reserve amount of \$2.3 million for the General Fund and \$300,000 in the Fire Fund should be sufficient. If the City was to also cut capital spending, then a General Fund reserve of \$1.3 million would be sufficient.

¹ The main report explains the origin of this term.

A plausible “black swan” for Sharonville would be a major employer closing, like Ford. To estimate the potential impact such an event would have on City’s income tax revenues, we use an analogous reference case of the closing of the General Motors plant located in Moraine, Ohio in 2008. While Sharonville’s industry base is slightly more diverse than Moraine’s, it is prudent to use Moraine’s recorded decrease in income tax revenues of 33 percent. Applying the “Triple-A” rule of doubling our expectation for uncertainty, we could estimate reserves in the amount of \$5.9 million for the General Fund and \$2.5 million for the Fire Fund. Again, the City has the potential ability to reduce its budget and capital expenditures in case of financial difficulty, thus the City could reserve between \$3.9 million and \$4.9 million in the General Fund.

Accounting for Uncertainty – The “Triple-A” Approach

Sizing a reserve requires estimating highly uncertain events, like natural disasters and economic downturns. To develop an adequate response, GFOA used the “Triple-A” approach:²

- **Accept.** First we must accept that we are subject to uncertainty, including events that we haven’t even imagined.
- **Assess.** Next, we must assess the potential impact of the uncertainty. Historical reference cases are a useful baseline.
- **Augment.** The range of uncertainty we really face will almost always be greater than we assess it to be, so we should augment that range. Historical reference cases provide a baseline, but that baseline may not be adequate to account for all future possibilities.

Secondary Risk Factor – Vulnerability to Extreme Events and Public Safety. There are a few types of extreme events that are of concern to the City. In 2001 it was declared a Federal Emergency Management Agency (FEMA) disaster area due to flooding, incurring \$200,000 in flood-related expenses. A rail yard also transverses the City, with some trains transporting hazardous materials. Additionally, tornados have hit communities within proximity to Sharonville, though the City has never been hit. The City believes that its flooding experience would be an adequate reference case for the combination of all of other extreme events the City might face. After examining past history of the City’s flood, GFOA suggests, using the Triple-A approach, a \$1 million reserve for extreme events.

Secondary Risk Factor – Expenditure Volatility. The City’s major expenditure volatility is accumulated sick leave for firefighters who are projected to retire over the next 16 years. Based on a statistical analysis, the City should begin to reserve between \$700,000 and \$1 million for the number of firefighters expected to retire over this period.

Recommendations. As outlined below, there are implied reserve amounts³ for each risk, but in determining the final reserve target, we cannot merely sum up the figures in the table below. We must consider the issues of risk “interdependency” or the relationship between different risk factors, the

² Triple-A approach adapted from: Spyros Makridakis, Robin Hogarth, and Anil Gaba. *Dance with Chance: Making Luck Work for You*. (Oneworld Publications: Oxford, England). 2009.

³ Targets have been rounded to nearest “whole” numbers for ease of use in policy making. Also, see the main body of the report for a discussion of the independence of the risk factors and the implication for sizing the reserve.

probability of the risk occurring, and the City's ability to reduce its budget in the event of a financial downturn.

Specific Risk	General Fund Implied Reserve Amounts	Fire Fund Implied Reserve Amounts
General revenue instability	\$1.3 to \$2.3 million	\$300,000
Closure of a major employer	\$3.9 to \$4.9 million	\$2 million
Extreme events and public safety	\$1 million	\$0*
Liability for accrued sick leave	\$0	\$1 million to \$700,000
TOTAL OF INDIVIDUAL FACTORS	\$6.2 to \$8.2 million	\$3.0 to \$3.3 million

*Fire response required by an extreme event assumed to be included in the General Fund reserve target.

If there is a great deal of dependency between the risks, then when one risk occurs it is highly likely that the others will as well. For these risks, it is wise to hold reserves in the full amount of implied reserve for each dependent risk factor. However, if there is some degree of independence, then it is highly unlikely that the independent risks will occur at one time so holding the full implied reserve amount for each independent risk might be excessive. The City's major risk dependency is between general revenue instability and the potential for a major employer closing as both are highly related to an economic downturn. The two remaining risks, extreme events and accrued sick leave, appear to be highly independent risks – the occurrence of either of these risks have little to do with the occurrence of other risks.

When risks are likely to occur, it is wise to hold full implied reserve amount. In the City's case, this would include its liability for accrued sick leave. When risks have a low probability of occurring and are independent of one another, then it is possible to hold less than the implied reserve amount. As such, the City may not want to hold full reserves to cover both the closure of a major employer and its risk for extreme events.

Lastly, multiple risk factors, revenue instability and the closure of a major employer, are interdependent and can occur simultaneously, though the City's ability to reduce the budget in response can only be accounted for once in the final reserve target.

In determining its reserve target, the City may consider its smaller size and greater leverage to borrow as needed as well as how it compares to other Ohio cities. In assessing Sharonville to the cities it compares itself to Sharonville has the lowest reserve levels but is the most reliant on income tax. This suggests the City might give stronger consideration to a target closer to the higher end of the recommended range of reserves. Ultimately, the City will need to assess its appetite for risk. If the City is more risk averse, then it could reserve the total of the implied reserve amount, approximately 52 percent of the City's general fund revenue and 50 percent of fire fund revenues. This equates to \$9.2 million and \$3.8 million respectively. If the City has a larger appetite for risk, it could reserve \$7.2 million or 41 percent of its general fund revenues and \$3.2 million or 42 percent of its fire fund revenues.

GFOA further recommends that the City develop and adopt formal policies to support its reserve strategy, including a general fund reserve policy, asset management policy, one-time and volatile revenue policies, and adopt structurally balanced budget policy.

Section 1 - Introduction

Reserves are the cornerstone of financial flexibility. Reserves provide a government with options to respond to unexpected issues and afford a buffer against shocks and other forms of risk. Managing reserves, though, can be a challenge. Foremost, is the question of how much money to maintain in reserve? How much is enough and when does a reserve become too much? This can be a sensitive question because money held in reserve is money taken from constituents and the argument could be made that excessive reserves should be returned to citizens in the form of lower taxes or additional services.

The City of Sharonville (the “City”) has been considering this question recently, especially in light of the volatility of its revenue portfolio. The City engaged the Government Finance Officers Association (GFOA) to help produce an answer. GFOA is a non-profit association of over 17,000 state and local government finance professionals and elected officials from across North America. A key part of GFOA’s mission is to promote best practices in good public finance, including reserve policies.

GFOA’s approach to reserves does not suppose “one-size-fits-all.” GFOA’s “Best Practice” on general fund reserves recommends, *at a minimum*, that general-purpose governments, regardless of size, maintain unrestricted fund balance in their general fund of no less than two months of regular general fund operating revenues or regular general fund operating expenditures (i.e., reserves equal to about 16 percent of revenues).⁴ However, this 16 percent is only intended as a baseline, and it needs to be adjusted according to local conditions. To make the adjustment, GFOA worked with the City to conduct an analysis of the risks that influence the need for reserves as a hedge against uncertainty and loss. GFOA also conducted an analysis of the City’s Fire Fund. The Fire Fund accounts for the City’s fire protection services, so like the General Fund, is central the City’s provision of essential services.

A “risk” is defined as the probability and magnitude of a loss, disaster, or other undesirable event.⁵ The GFOA’s framework of risk assessment is based on the risk management cycle: identify risks; assess risks; identify risk mitigation approaches; assess expected risk reduction; and select and implement mitigation method. The framework focuses primarily on risk retention, or using reserves, to manage risk. However, the framework also encourages the City to think about how other risk management methods might alleviate the need to retain risk by building up larger reserves. In other words, can the City manage its risks in some other way besides holding a reserve? Hence, a thorough examination of the risk factors should not only help lead to customized reserve target size, but also improve the City’s understanding of the risks it faces and its overall financial risk profile.

As first step to this project, GFOA conducted a basic review of the risk factors that generally influence the amount of reserves a municipal government should hold.⁶ This review enabled the City and GFOA to

⁴ GFOA Best Practice. “Appropriate Level of Unrestricted Fund Balance in the General Fund.” GFOA. 2009.

⁵ Definition of risk taken from: Douglas W. Hubbard. *The Failure of Risk Management: Why It’s Broken and How to Fix It*. John Wiley and Sons, Inc. Hoboken, New Jersey. 2009.

⁶ The risk factors and basic review method were developed and published in the GFOA publication: Shayne C. Kavanagh. *Financial Policies*. (Government Finance Officers Association: Chicago, IL) 2012.

classify factors as primary risks or as secondary risks. Exhibit 1.1 lists how the risk factors were classified. The factors were classified identically for the General Fund and Fire Fund.

Exhibit 1.1 – Categorization of Risk Factors that Influence Reserve Levels for Sharonville	
<i>Primary Risk Factor</i>	
Revenue (Income Tax) Volatility	
<i>Secondary Risk Factors</i>	
Vulnerability to Extreme Events and Public Safety Concerns	
Dependency of other funds on the General Fund	Capital Projects
Leverage	Expenditure Volatility
Liquidity / Cash Flow	Growth of the Community

The rest of this report is composed of the following sections:

- **The Approach to Uncertainty.** Risks are, by definition, uncertain events. This section describes the “Triple-A” approach to analyzing and planning for uncertain events. The Triple-A approach was used to analyze the risk factors described in Exhibit 1.1.
- **Primary Risk Factor Analysis.** This section analyzes the risk posed by revenue volatility and income taxes in particular.
- **Secondary Risk Factor Analysis.** This section reviews secondary risk factors that have less weighty implications for the City’s General Fund and Fire Fund reserve strategy.
- **Final Recommendation.** This final section of the report presents the conclusion of the analysis. It addresses a target reserve level for the City’s General Fund and Fire Fund and provides other suggestions to improve the financial health of the City as well as to support a sustainable reserve strategy.

Section 2 - The Approach to Uncertainty

Risks are inherently uncertain. The accomplished forecasting scientist, Spyros Makridakis, has suggested a “Triple-A” approach for dealing with highly uncertain phenomena.⁷

1. **Accept.** First we must accept that we are subject to uncertainty. For example, our analysis of income tax shows that it is subject to quite a bit of variation, including seasonal variation and variation from year-to-year. It is also subject to uncertainty from the economy, with the closure of a major employer being a particularly important uncertainty. Because it is relatively easy to imagine scenarios that could cause the Sharonville economy to suffer, we must also accept that the City’s financial position is subject to additional potentially dangerous unknowns that we cannot imagine.
2. **Assess.** Next, we must assess the potential impact of the uncertainty. Past history can provide a useful reference point. To illustrate, later in this report we will review the degree of fluctuation Sharonville has experienced with its income tax revenue in the Fire Fund and General Fund. We also examine a reference case from analogous situation. In this report, we look at how the

⁷ See: Spyros Makridakis, Robin Hogarth, and Anil Gaba. *Dance with Chance: Making Luck Work for You*. (Oneworld Publications: Oxford, England). 2009.

closure of a major employer impacted income taxes in another smaller Ohio municipality, the City of Moraine.

3. **Augment.** The range of uncertainty we actually face will almost always be greater than what we assess it to be, so we should augment that range. For example, we will later see, in Section 3, that the historical fluctuation in the City's income tax revenue has been significant. However, it is not difficult to imagine the City experiencing an unanticipated event that causes an unprecedented decline in income tax revenue. As a rule of thumb, Makridakis suggests doubling your range of uncertainty if you have little historical data to rely on or multiplying it by 1.5 if you have more. We will refer to the Triple-A approach and these guidelines throughout the analysis.

Section 3 - Analysis of the City's Primary Risk: Revenue Volatility

This section presents the analysis of the City's primary risk – volatility of its revenue sources, particularly the income tax. The City's income tax revenue is split between General Fund and the Fire fund: a 1% income tax is dedicated to the general fund and a 0.5% income tax is dedicated to the Fire fund. Income tax revenue is, by far, the City of Sharonville's most important general fund revenue source. On average, it has comprised over 83 percent of the City's general fund revenues since 2005. The income tax is even more important to the fire fund – it has comprised over 90 percent of the fire fund revenues since 2005.

A. Volatility of the Income Tax

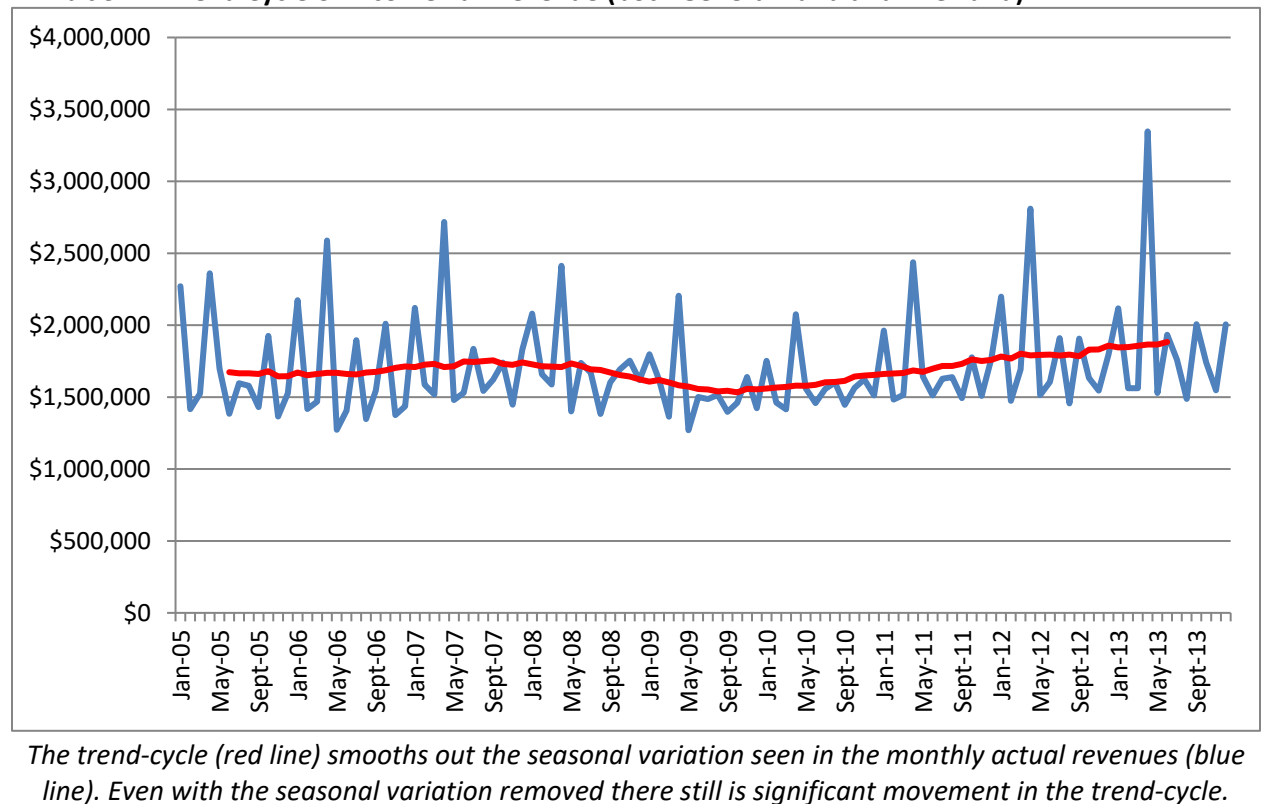
The income tax has a reputation for volatility. This is because the amount of income tax revenue the City receives varies by month. The City sees particularly large spikes in April, when the City has received on average, since 2005, 12 percent of its annual income tax revenue. If the income tax revenue were evenly distributed, the City would only receive 8 percent of the total income tax revenue every month. There also smaller spikes in January, October, and July. The blue line in Exhibit 3.1 shows the variable monthly pattern that the City experiences in its total income tax revenue for both the General Fund and Fire Fund.

Annual variation is a greater concern for the City's reserve strategy than monthly variation because annual variation is what makes budgetary planning more difficult. Since 2005 general fund income tax revenues have grown by as much as 9.7 percent in a single year and declined by as much as 8.6 percent in a single year. On average the City has experienced a 6.2 percent change (regardless of increase or decrease) in general fund income taxes from year to year. In other words, income tax revenues are rarely very similar to what they were the prior year – there is often a big movement in one direction or the other. By way of comparison, GFOA recently performed a reserve analysis for a smaller municipality in another state where volatility of sales tax revenues was a major concern – however, this city only experienced a 2.9 percent average change in its year-to-year revenues.

Exhibit 3.1 also shows a red line which is the "trend-cycle." As the name implies, a trend-cycle line is intended to show longer term trends and the impact of business cycles by smoothing out seasonal (i.e., monthly) variation. The trend-cycle line is calculated by using a 12-month "centered moving average." A 12-month centered moving average defines the average value for a given month as the mean of that month plus the six months before, plus the five months after. So, for example, in Exhibit 3.1 the moving

average for January 2011 would be an average of August 2010 through July 2011. February 2011 would be an average of September 2010 through August 2011, and so on. The trend-cycle line reveals some notable movement. In fact, the minimum and maximum values of the trend-cycle line are each about 10 percent different from the average value of the trend-cycle. For the purposes of comparison, the trend-cycle line for the smaller city referenced earlier only varied about 6 percent in either direction from the average value.

Exhibit 3.1 – Trend Cycle of Income Tax Revenue (both General Fund and Fire Fund)



A final indicator of volatility in the income tax is the proportion of variation in the revenue that is due to random forces as opposed to seasonal impacts or changes in the underlying trend or business cycle. Using a technique known as multiplicative decomposition,⁸ we can surmise that about 12 percent of the observed variation is due to random forces. As a point of comparison, consider the cases of the City of Colorado Springs and the City of Boulder (both in Colorado). GFOA performed multiplicative decomposition analysis for the sales tax revenues in these cities in order to analyze the level of random variation. About 2 percent of the variation in Colorado Springs' sales tax revenues was attributable to random forces while the figure was 4 percent for Boulder. Hence, Sharonville's figure of 12 percent is significant.

⁸ Multiplicative decomposition is a statistical technique that decomposes revenues into three components: the trend-cycle, seasonal variation, and random elements.

B. The Income Tax and Reserves

While the income tax itself is volatile, the volatility of the City's entire revenue portfolio is what drives the need for reserves. Hence, the question becomes: what is the relationship between the income tax, the City's financial risk, and the reserves used to mitigate that risk? There are two parts to the answer to this question: volatility of the City's entire general fund revenue portfolio and "black swans."

Generalizable Volatility of the City's Entire Revenue Portfolio. Unfortunately, the City's other general fund revenues besides the income tax has also been volatile. Since 2005 the other general fund revenues have declined by as much as 28 percent in a single year and increased by as much as 13 percent (e.g., all other revenues in the general fund besides the income tax). The average change year-to-year change (regardless of whether it is an increase or a decrease) was 7.8%. However, there is an important caveat to consider when using the City's historical experiences with revenue volatility as an indicator of the future. First, the inheritance tax that the City has traditionally received has been eliminated by changes in State law, soon eliminating this revenue stream. Second, the local government funding from the state and county has been declining, and as a matter of state policy, is expected to stay at a significantly lower level than in the past. This has two important implications for our risk-based reserve analysis:

- The City's revenue portfolio will be less diverse than in the past. Without these revenue sources, the income tax becomes around 90% of general fund revenue.
- The inheritance tax and local government assistance from the State were very volatile revenues. To illustrate, the category of "intergovernmental revenue" (which accounts for these sources) has increased by as much as 41 percent in a single year and declined by as much as 40 percent. Hence, the City's average year-to-year revenue portfolio volatility will probably not change much as a result of the loss of these revenue sources. Over the last five years the average year-to-year change of all revenues was just over 7 percent.⁹ If you remove the inheritance tax and local government funding and recalculate the volatility, the average volatility is just under 7 percent.

Excluding income taxes, the revenues comprising the Fire Fund were also volatile with an average year-to-year change of around 15 percent. Of course, in the Fire Fund the other revenues are not as large a portion of total revenues than in the General Fund, but they still contribute to the revenue volatility faced by the City.

Exhibit 3.2 shows the actual revenues for the City's major revenue categories for the General Fund. Exhibit 3.3 shows the year-to-year percent changes for each revenue category for the General Fund. Exhibits 3.4 and 3.5, respectively, provide the same information for the Fire Fund.

⁹ This differs from the figure of 7.8 percent cited in the previous paragraph because this figure only covers the period 2008 to 2013, while the 7.8 percent covers 2005 to 2013.

Since we have established that the income tax has a fundamentally volatile nature and that the City's other revenues show volatility it stands to reason that the City could benefit from a reserve to counteract this volatility. In the General Fund, the largest annual decrease in the City's revenues was in 2009, which witnessed a drop of 12.5 percent from 2008. This year also saw the largest decreases in the income tax as well as the intergovernmental revenues across our entire 9-year analysis period (2005 to 2013). Hence this year should provide a reasonable reference point for the upper limit of downside risk the City faces in its revenue portfolio. However, the Triple-A approach to managing uncertainty directs that we multiply the level of risk suggested by historical reference points. The Triple-A approach suggest a multiple of 2.0 if we have little data to draw from and a multiple of 1.5 if we have more data. Since we have examined almost 10 years of data, including data around the time period of the Great Recession, a multiple of 1.5 is more appropriate. This means the worst downturn the City should plan for in the General Fund would be an 18.75 percent decrease in revenues due to general changes in the business cycle. An 18.75 percent decrease in revenues is about \$3.3 million in the general fund.

Taking a similar approach for the Fire Fund, the lowest point during this nine-year period was also 2008 when total revenues decreased 7 percent from the previous year. Multiplying that by 1.5 gives us 10.5 percent. Using this as the reasonable reference point, the City should plan \$800,000 as the upper limit of downside risk.

However, should the City experience a decrease in revenues it would respond by reducing its budget and not rely on reserves to cover the entire amount of the reduction, so reserving \$3.3 million for the General Fund and \$800,000 for the Fire Fund would be excessive. The City's finance department estimates that the budget could be reduced by approximately \$1 million and \$500,000 in the General and Fire Funds, respectively, without creating a major disruption to services (though service quality would be negatively affected to some degree, of course). The City's finance department also believes that the General Fund could also reduce capital expenses by approximately \$1 million; however, there would be adverse effects to facility and infrastructure condition if perpetuated for multiple years.

Given the City's ability to reduce the budget if it was to experience severe financial difficulty, a reserve amount of \$2.3 million for the General Fund and \$300,000 in the Fire Fund should be sufficient. If the City was to also cut the capital spending referenced in the preceding paragraph, then a General Fund reserve of \$1.3 million would be sufficient.

Exhibit 3.2 – General Fund Revenues (in thousands of dollars)

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Taxes	13,238	12,923	13,833	12,899	11,789	12,366	13,567	14,059	14,924
Intergovernmental*	941	831	1,138	1,606	966	1,016	897	1,021	1,091
Charges for Services	416	404	367	292	325	371	341	391	350
Licenses and permits	478	444	397	524	467	484	526	533	473
Investment earnings	408	694	640	367	40	20	15	18	79
Fines and forfeitures	372	376	349	289	301	341	360	384	334
All other revenues	184	96	59	141	214	376	424	274	373
Total	\$16,038	\$15,766	\$16,784	\$16,117	\$14,102	\$14,973	\$16,130	\$16,680	\$17,624

Exhibit 3.3 – General Fund Revenue Year-to-Year Changes (in thousands of dollars)

	2006	2007	2008	2009	2010	2011	2012	2013
Taxes	-2.4%	7.0%	-6.8%	-8.6%	4.9%	9.7%	3.6%	6.2%
Intergovernmental*	-11.7%	37.0%	41.1%	-39.8%	5.1%	-11.7%	13.8%	6.9%
Charges for Services	-3.1%	-9.0%	-20.6%	11.5%	14.0%	-8.2%	14.7%	-10.4%
Licenses and permits	-7.2%	-10.6%	31.9%	-10.8%	3.6%	8.6%	1.4%	-11.2%
Investment earnings	69.8%	-7.7%	-42.7%	-89.0%	-50.5%	-24.2%	18.9%	336.7%
Fines and forfeitures	1.1%	-7.3%	-17.2%	4.0%	13.4%	5.8%	6.6%	-13.1%
All other revenues	-48.0%	-38.1%	138.5%	51.4%	75.8%	12.8%	-35.4%	36.3%
Total	-1.7%	6.5%	-4.0%	-12.5%	6.2%	7.7%	3.4%	5.7%

*Includes inheritance tax and local government funding from the State of Ohio. As was described earlier in this report, the inheritance tax will be discontinued or and local government funding will be greatly reduced

Exhibit 3.4 – Fire Fund Revenues (in thousands of dollars)

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Taxes	6,296	6,409	6,457	6,429	5,738	5,827	6,339	6,809	7,153
Intergovernmental	16	1		13					
Charges for Services	380	406	481	433	644	519	504	448	460
Fines and forfeitures						1.8	0.9		
All other revenues	0.02	12	2.6	2.8	18	36	2	14	53
Total	\$ 6,692	\$ 6,828	\$ 6,941	\$ 6,877	\$ 6,401	\$ 6,384	\$ 6,846	\$ 7,271	\$ 7,665

Exhibit 3.5 – Fire Fund Revenue Year-to-Year Changes (in thousands of dollars)

	2006	2007	2008	2009	2010	2011	2012	2013
Taxes	1.8%	0.7%	-0.4%	-10.7%	1.6%	8.8%	7.4%	5.1%
Intergovernmental	-92.9%		NA					
Charges for Services	6.7%	18.6%	-10.1%	48.9%	-19.5%	-2.8%	-11.1%	2.6%
Fines and forfeitures						-50.2%		
All other revenues	61846.5%	-77.9%	6.9%	559.1%	97.6%	-94.7%	632.2%	277.0%
Total	2.0%	1.7%	-0.9%	-6.9%	-0.3%	7.2%	6.2%	5.4%

“Black Swans.” A “Black Swan” event is a rare and unpredictable event that has an extreme impact. The term was coined by acclaimed financial thinker Nasim Talib and derives from a belief held in England before 1697 that all swans were white – in fact, the term “black swan” was a common metaphor at the time for something thought to be impossible. Black swans were discovered in Australia in 1697 demonstrating the limits of human knowledge about the world. Black Swan events are, by definition, impossible to predict, so the best that anyone can do is to be prepared. Of course, any number of Black Swan events could impact the City from a meteor strike to gold being discovered under City Hall, and there is little value in considering the impact of such extremely unlikely occurrences. However, there is value in considering a more plausible event – the closure of a major employer, such as the Ford plant.

Revenue on income taxes paid by employers in the community has historically been responsible for about 80 percent of the City’s income tax revenue (with the remainder coming mainly from business profits and individual income). Unfortunately, the City does not have access to reliable data on how much of its income tax revenue is attributable to a major employer, like Ford. Further, even if the City did have access to this kind of data it would not tell the whole story because of what are called the “multiplier effects” of large industrial employers. Any major employer and its employees spend money inside of Sharonville. This money creates additional jobs, which brings in additional income tax revenue to the City. For example, there are many businesses that provide various types of support services to these major employers – for example, the restaurants that benefit from workers at local employers and service providers, such as insurance companies. Therefore, if a major employer were to close then not only would the City lose income tax revenues from wages paid out by that employer, the City would also feel an impact from reduced employment in the ecosystem of support businesses around the major employer.

Hence, absent the necessary data and short of undertaking the complex economic modeling that would be necessary to discern the precise potential impacts of the closure of a major employer, the best way to estimate the potential impact on Sharonville is to examine an analogous reference case. The City of Moraine, Ohio is a community of 6,307 outside of Dayton. The City has a 2 percent municipal income tax and the tax is a significant portion of the City’s revenues at about 80 percent of all general fund revenue.¹⁰ Moraine was home to a larger General Motors manufacturing plant since 1919 until the plant closed in 2008. Exhibit 3.6 shows the impact of the closure on the City’s income tax revenue for all governmental funds.¹¹

As Exhibit 3.6 shows, income tax revenues declined sharply from their peak of \$20.3 million in 2006 to \$10 million in 2012 – just over a 50 percent drop. However, the reader should also notice that before 2005 the City consistently received around \$15.5 million each year from income taxes. It is only because income tax revenues shot up to such heights during the years associated with the economic bubble that preceded the Great Recession that the fall is so great. For our purposes of analyzing Moraine as a

¹⁰ Based on data from fiscal years 2010, 2011, and 2012.

¹¹ Due to the limitations on the type of historical data GFOA has access to, data is presented for all governmental funds, not just the general fund (GFOA does not have access to general fund income tax data before 2008)

GFOA Reserve Analysis for the City of Sharonville

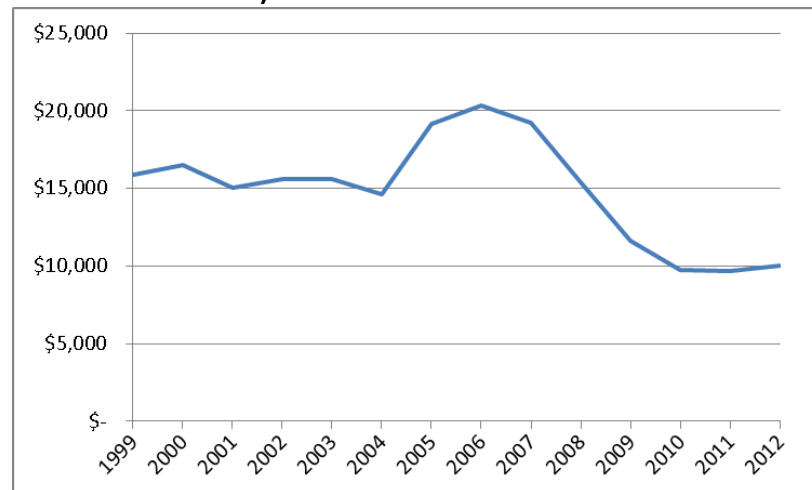
reference case it might be more realistic to focus on the reduction of revenue from \$15.5 million to \$10 million or about a 33 percent decrease.

We also need to consider the relative Sharonville's relative vulnerability to the closure of a major employer as compared to Moraine. Meaning, if Sharonville has a more diversified or less diversified tax base than Moraine, then its vulnerability to the closure of a major employer would be lesser or greater, respectively.

We start considering relative vulnerability by examining

how employment in the two communities is divided between different industries. Exhibit 3.7 and Exhibit 3.8 show the percentage share of total employment for the top ten industries in each community, as well as the median wage in that industry. Note that we are comparing Sharonville in 2011 (the most recent year for which data are available to GFOA) to Moraine in 2007 (in order to best compare the cities before the closure of a major employer).¹² The tables show that the top ten industries provide roughly the same share of employment for both communities: 86 percent to 88 percent. Sharonville is slightly less dependent on manufacturing than Moraine was, but not by much. The real story in Exhibit 3.7 and 3.8 is the median wage. In Moraine, manufacturing paid the highest median wage as it does in Sharonville in 2011. However, outside of manufacturing the median wages are significantly higher in Sharonville. In fact, the average of all of the median wages presented in Exhibit 3.8 for Sharonville is \$42,586, while only \$30,572 in Moraine.¹³

Exhibit 3.6 – Income Tax Revenue in the City of Moraine, Ohio (in thousands of dollars)



Moraine's income tax revenues fell significantly after the closure of a General Motors plant in 2008.

Employment Heat Maps

Appendix 1 provides "heat maps" that show how employment was concentrated in Sharonville in 2011 versus Moraine in 2007. The maps show, visually, that Sharonville's employment appears to be less concentrated than Moraine's was.

¹² All data for these Exhibits is from the US Census.

¹³ Note that the total median wages presented in Exhibits 3.7 and 3.8 are weighted to account for the relative share of each of the industries. Also, there should not be a major inflationary difference between the wage figures. Due to the nature of how Census data are collected the median wage figures represent the period 2008-2012 for both cities.

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Exhibit 3.7 - Moraine 2007 Top Employers

Industry	Share	Median Wage
Manufacturing	23.1%	\$48,140
Construction	10.4%	\$14,844
Retail Trade	8.0%	\$14,963
Health Care and Social Assistance	7.7%	\$22,326
Professional, Scientific, & Technical Services	7.4%	\$44,943
Admin & Support	6.9%	\$16,824
Utilities	6.4%	\$36,389
Wholesale Trade	5.6%	\$26,612
Transportation and Warehousing	5.4%	\$36,056
Accommodation and Food Services	5.1%	\$8,995
TOTAL	86.0%	\$30,572

Exhibit 3.8 - Sharonville 2011 Top Employers

Industry	Share	Median Wage
Manufacturing	20.9%	\$55,257
Wholesale Trade	12.9%	\$37,404
Transportation and Warehousing	11.7%	\$51,000
Admin & Support	8.6%	\$30,339
Educational Services	6.8%	\$41,487
Professional, Scientific, & Technical Services	6.6%	\$47,372
Retail Trade	5.8%	\$31,890
Accommodation and Food Services	5.3%	\$11,304
Health Care and Social Assistance	5.1%	\$48,295
Construction	4.0%	\$38,472
TOTAL	87.7%	\$42,586

Because Sharonville is less dependent on manufacturing than Moraine was and because Sharonville has a higher median wage across its employment base we can conclude that the City of Sharonville would probably suffer less of an income tax loss from the closure of a major employer, compared to what Moraine experienced. In fact, if one assumes the closure of a major employer in 2007 would cut

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Moraine's share of manufacturing roughly in half,¹⁴ but everything else remained constant, then the total income tax from the City's top ten industries would decline about 20 percent. If this scenario were applied to Sharonville in 2011, the income tax base would only decline about 10 percent. Again, this is due to the fact that Sharonville is somewhat less reliant on manufacturing and, mostly, because the other industries in Sharonville pay higher wages than in Moraine. Of course, in reality, if manufacturing's share of the economy were to be cut in half everything else would not remain constant, but the example does illustrate that Sharonville's slightly more diverse industry composition makes it less vulnerable to changes to its economic base, in general. Therefore, we can conclude the 33 percent decrease in income tax revenue experienced by Moraine is probably more than sufficient to cover what Sharonville could expect to experience in the wake of major employer closing. An argument could be made that this number could be cut significantly for Sharonville, even in half, but if we follow the Triple-A rule we must appreciate that we are basing this analysis on a single reference case. The Triple-A rule advises us to double our expectations for uncertainty when we have a small data set, so even if we were to cut the number in half we would need to double it again. As such, 33 percent appears to be a prudent reference point. A 33 percent decline in Sharonville's income tax revenue translates to \$5.9 million for the General Fund and \$2.5 million for the Fire Fund.

As with the reserve for the entire revenue portfolio due to year-to-year volatility discussed earlier in this report, the City would presumably start reducing its spending immediately in response to the closure of a major employer. Therefore, to reserve the entire amounts described in the preceding paragraph would be excessive. Again, the City budget office estimates that the budget could be reduced by approximately \$1 million and \$500,000 in the General and Fire Funds, respectively,

without creating a major disruption to services (though service quality would be negatively affected to some degree, of course). The General Fund could also reduce capital expenses by approximately \$1 million; however, there would be adverse effects to facility and infrastructure condition if perpetuated for multiple years. Hence, the City's General Fund reserve would only need to be as much as \$4.9 million or as little as \$3.9 million. The Fire Fund's reserve would need to be \$2 million after accounting for the potential to reduce the budget. Please note that potential to reduce the budget has been used twice in the analysis and will be addressed in the concluding section of the report when all of the factors are considered together to reach a final target.

Why an Implied Reserve Component?

The reader will notice that the blue summary boxes for each risk factor refer to "implied" reserve components. This is because the amounts described are implied reserve amounts based on analysis of that risk factor in isolation. As will be addressed later, a final recommended reserve target must consider all of the risks together.

¹⁴ This is, in fact, about the decline Moraine's manufacturing industry experienced up until 2011.

GFOA Reserve Analysis for the City of Sharonville

Implied Reserve Components for Revenue Instability

- For general revenue instability:
 - In the General Fund, between \$1.3 million and \$2.3 million
 - In the Fire Fund, \$300,000
- For closure of a major employer
 - In the General Fund, between \$3.9 million and \$4.9 million
 - In the Fire Fund, \$2 million

Section 4 - Secondary Risk Factor Analysis

This section overviews risk factors that have implications for the City's reserve strategy, but are less complex or of lower magnitude than the primary risk factor of revenue volatility.

A. Vulnerability to Extreme Events and Public Safety

The City has not been subject to many serious extreme events in the past. Though, there are three types of extreme events that are of concern:

- **Flooding.** In 2001, the City was included in a Federal Emergency Management Agency (FEMA) disaster area, so flooding is a proven risk. In 2001, the City incurred about \$200,000 for flood response, as well as overtime costs for public safety personnel. Insurance and FEMA reimbursement ultimately covered most of these costs.
- **Rail accident.** A rail yard goes through the middle of the City, with some trains transporting hazardous materials. Hypothetically, a leakage could require an emergency response and might shut down businesses for some period of time (a matter of weeks).
- **Tornados.** The City has never been hit by a tornado, but tornados have hit other communities located within proximity to Sharonville.

In general, the City does not appear to be exposed to major risk from extreme events. It has very little history of extreme events and even the risks from the hypothetical scenarios are relatively minor. Further, the City has insurance on its facilities and should receive FEMA support in the event of a very extreme event. Finally, the City has a well-equipped and trained fire department, which should help mitigate risks the City faces from extreme events.

Implied Reserve Components for Extreme Events and Public Safety

- After an adjustment for inflation, the \$200,000 incurred by the City in 2001 equates to about \$250,000 in today's dollars. The City believes that the flooding experience would be an adequate reference case for the combination of all of other extreme events the City might face (i.e., tornados and the rail accident would both be covered by an additional \$250,000). As such, \$250,000 accounts for future flooding and an additional \$250,000 accounts for the other extreme events results to \$500,000. Using the Triple-A guidelines, since we have only one data point, we should double our estimate of risk for a total of \$1 million.
- Since the response to an extreme event would likely be accounted for in a reserve in both the General Fund and the Fire Fund, the City can either account for a proportional amount in both funds or account for it in the General Fund with the understanding that an interfund transfer

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may be necessary in the event the reserve has to be used. For the sake of simplicity in this report, GFOA will assume that this reserve will be accounted for in the General Fund.

B. Growth

The City is not expecting to see much growth. Hence, a reserve to cushion the City's finances against the short-term costs of growth is not necessary.

Implied Reserve Components for Growth

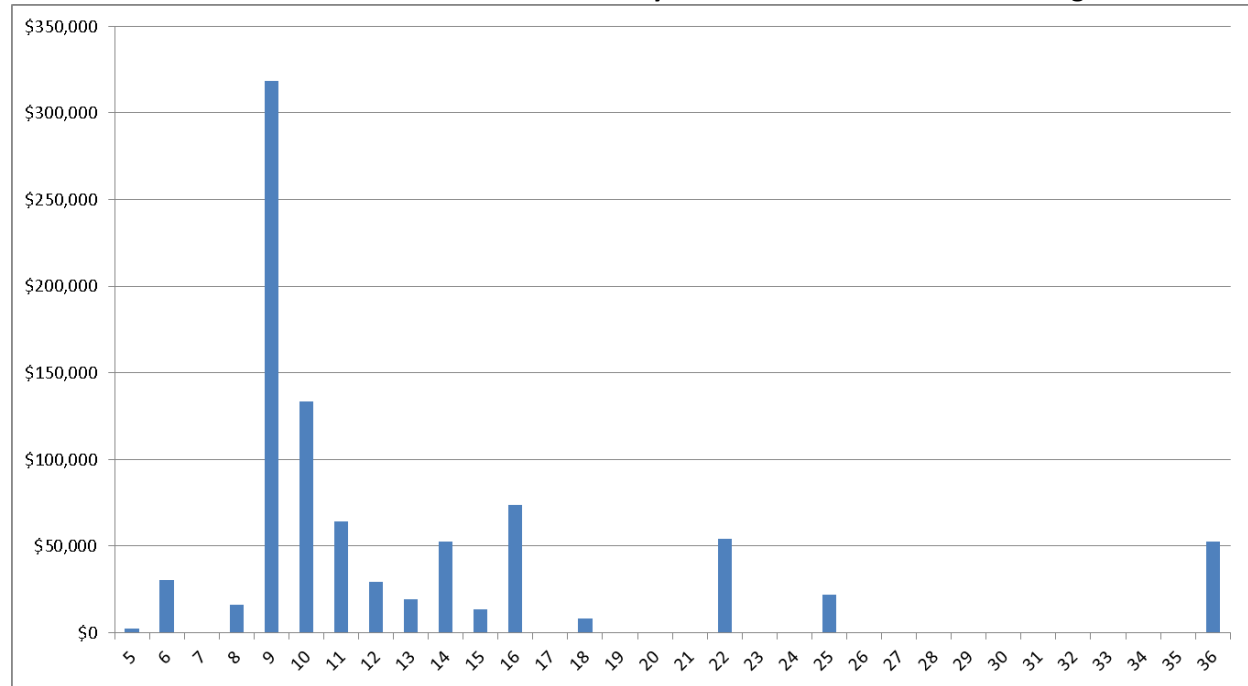
- No reserve for growth needed.

C. Expenditure Volatility

The City's major expenditure volatility risk is payouts for accumulated sick leave for a large cohort of firefighters who are projected to retire over the next 16 years. The City has taken steps to reduce its liability for accumulated leave by changing its personnel policy for new hires, but it still should prepare for the payouts associated with existing employees. Exhibit 4.1 shows a distribution of the liabilities for the Fire Fund, with total liability for sick leave grouped by years of service for each employee. For example, we can see that the cohort of employees with nine years of service has the highest total liability by far. This is because this cohort has the largest total number of employees at 15 – the next largest cohort only has five employees (the ten years-of-service cohort). Hence, the City should develop and maintain a reserve for these liabilities. The largest cohorts of firefighters are not expected to retire for a number of years. If we consider the nine to 16 years-of-service cohorts, the City currently has just over a \$700,000 liability.

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Exhibit 4.1 – Total Liabilities for Accrued Sick Leave by Years-of-Service Cohorts of Firefighters



The largest liabilities are the nine and ten years-of-service cohorts.

Of course, the total liability is a bit of moving target since employees can accumulate and use sick leave over time. GFOA's statistical analysis of the City's data shows only a weak to moderate relationship between the employee's years of service and the City's total liability. A statistical prediction based on years-of-service tells us that, on average, the City might expect to have a liability of about \$32,000 for an employee after 25 years of service. However, only between 16 percent and 43 percent of the observed variation in liability can be explained by years-of-service¹⁵ – other factors appear to be more important explanatory variables (such as employees' proclivity to use sick time, for example). Therefore, the statistical analysis can provide some insight into the potential future liability, but is far from a perfect predictor. For now, the City should begin to develop a reserve between \$700,000 and \$1 million (the amount the statistical analysis would suggest is necessary), but should update its reserve target periodically in response to actual changes in the liability. A strategic long-term financial planning process is the ideal forum to monitor this strategy, so the City may wish to consider developing such a process as part of its financial planning and budgeting practices.

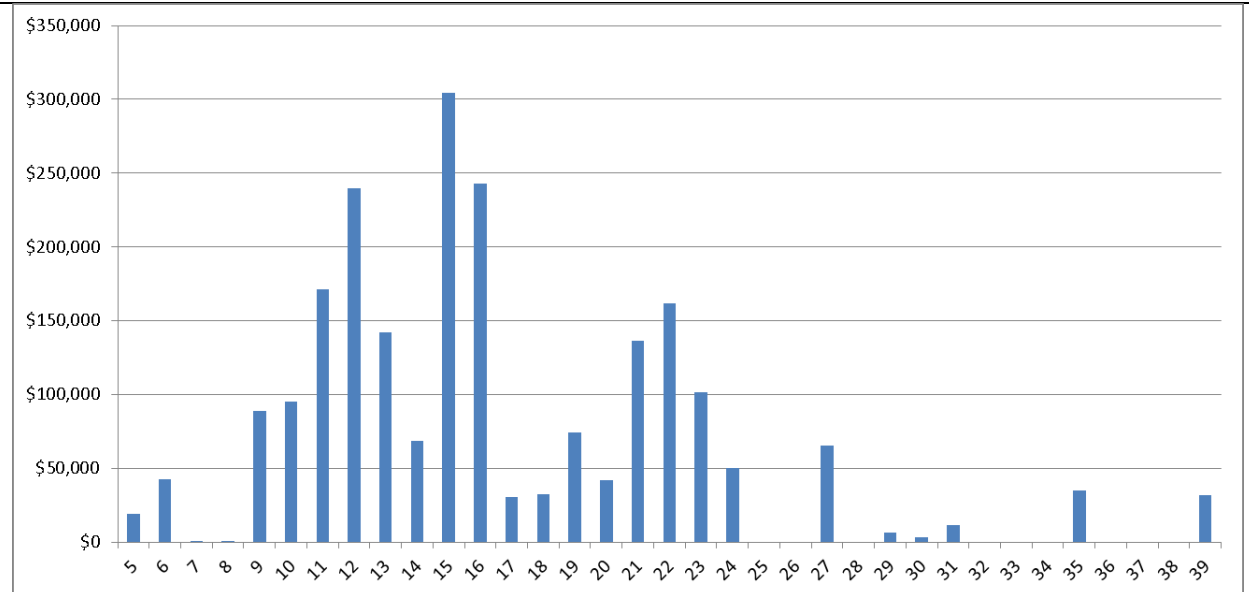
For employees in the General Fund, the total liability for each years-of-service cohort looks a little different (see Exhibit 4.2) – the largest cohort is again in the 9 to 16 years-of-service range, where the total liability is \$1.35 million. However there is also a smaller but not insignificant "bulge" in the graph for the 17 to 24 years-of-service range, where the total liability is about \$630,000. The total of these two liabilities (\$1.98 million) is just over 11% of the City's current general fund revenue. By comparison, the

¹⁵ These percentages are derived using a statistical technique known as correlation analysis. The lower figure results from analyzing each employee individually. The higher figure results from analyzing each cohort as a group.

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\$700,000 liability of the Fire Fund that was described earlier amounts to just under 10% of the Fire Fund's current revenues. Hence, the General Fund's liability is at least as significant as the Fire Fund's. Therefore, the City should also give consideration on how to fund the General Fund's liability over the long-term. A statistical analysis shows a very weak relationship between years-of-service and total liability so it is not possible to make a useful statistical forecast of the City's future liability, like we did for the Fire Fund. Hence, the City should begin with a target of \$2 million, but should closely monitor how the liability changes over time and adjust accordingly.

Exhibit 4.1 –Liabilities for Accrued Sick Leave by Years-of-Service Cohorts of General Fund Employees



Like the Fire Fund, there is a large liability for employees with between 9 and 16 years of service. There is also a large liability for employees with between 17 and 24 years of service.

Implied Reserve Components for Expenditure Volatility

- The City should target a reserve in the Fire Fund of between \$700,000 and \$1 million for the cohort of firefighters between nine and 16 years of service and build towards this amount over time. The City should monitor its actual liabilities and adjust its reserve as circumstances suggest.
- The City should target a reserve in the General Fund of about \$2 million for the cohort of employees between 9 and 24 years of service and build towards this amount over time. The City should monitor its actual liabilities and adjust its reserve as circumstances suggest. Note that the bulk of this liability occurs more towards the nine years-of-service cohort, so the liability will not be due in the near term future.
- A regular long-term financial planning process would help the City maintain course on its strategy.

D. Liquidity

The City does not experience cash flow problems as a result of timing differences between its receivables and payables. The City does have 25 percent of its assets in less liquid instruments, but this does not appear to be a significant source of risk.

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Implied Reserve Components for Liquidity

- No reserve for working capital is needed.

E. Dependency of Other Funds on the General Fund

The most important consideration under this risk factor is the City's convention center. In the past, this enterprise activity required subsidization from the General Fund to service its debt. However, today the convention center has retired a significant amount of its debt and has also established a bond reserve fund to help mitigate against any interruptions to the payment stream used to service the debt. The convention center also receives a portion of the City's hotel tax to help it remain self-sufficient. Due to these measures to make the convention center self-sufficient, no reserve for inter-fund dependency is required.

Implied Reserve Components for Inter-Fund Dependencies.

- No reserve for inter-fund dependency is needed.

F. Leverage

Any form of leverage could reduce the City's financial flexibility, thus increasing the need for reserves to provide some offsetting flexibility. GFOA examined three forms of leverage.

- **Outstanding debt.** The City's General Fund is not heavily burdened by debt – much of existing debt is set to expire in the next five years.
- **Pension and OPEB liabilities.** The City is part of the State of Ohio's pooled plan (Ohio PERS). The plan has maintained a funded ratio around 75 percent over the past several years and according to a 2013 report by Moody's Investor Service, Ohio is in the top ten best states in terms of adjusted net pension liability compared to revenues, state GDP, personal income, as well as per capita measures. Therefore, it seems unlikely that the City will be presented with a large, unexpected spike in pension costs and a special reserve is, hence, unnecessary. Additionally, the City does not offer post-employment benefits to employees other than payouts of unused leave, which has been addressed in an earlier section of this report.
- **Infrastructure maintenance.** The City has recently implemented a new capital planning process that addresses maintenance of Facilities and has dedicated \$500,000 for addressing maintenance needs and intends to set aside \$150,000 to \$300,000 annually to meet the needs of The City's Improvement Plan.

Implied Reserve Component for Leverage

- No reserve for leverage is needed.

G. Capital Projects

The City has a capital improvement plan that describes its capital needs for the coming years. Funding sources for the City's street repair/replacement needs have been identified. The City is currently working on a sinking fund to replace fire equipment and is working on a policy to formalize its

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commitment to not use emergency reserves for capital projects that were known of in advance and that are not immediately critical.

Implied Reserve Component for Leverage

- **The City should continue to enhance its already strong long-term capital improvement planning process to manage capital financing. No project that was known in advance should rely on an emergency reserve. The City should also develop a debt policy to help guide wise and productive use of debt.**

Section 5 - Recommendations

This section provides GFOA's recommendations to Sharonville based on the analysis presented in this report. Sub-section "A" reviews the risk factors that were analyzed independently in Section 3 and Section 4 and considers issues relative to analyzing the risk factors as a whole. Sub-section "B" addresses the primary purpose of this report: to recommend a reserve target for Sharonville. Sub-section "C" discusses formal policies the City could adopt to support the City's reserve management strategy.

A. Review of Risk Factors and Holistic Analysis

This sub-section establishes the recommended reserve target for Sharonville. We will start with a brief overview of the risk factors that have implications for the City's reserves in Exhibit 5.1.

Exhibit 5.1 – Risk Factor Overview

Specific Risk	General Fund Implied Reserve Amounts	Fire Fund Implied Reserve Amounts
General revenue instability	\$1.3 to \$2.3 million	\$300,000
Closure of a major employer	\$3.9 to \$4.9 million	\$2 million
Extreme events and public safety	\$1 million	\$0*
Liability for accrued sick leave	\$0	\$1 million to \$700,000
TOTAL OF INDIVIDUAL FACTORS	\$6.2 to \$8.2 million	\$3.0 to \$3.3 million

*Fire response required by an extreme event assumed to be included in the General Fund reserve target.

However, determining a final reserve target is not as straightforward as summing the numbers in Exhibit 5.1. There are three issues we must consider before arriving at a final target:

- Risk interdependency,
- Risk's probability of occurring, and
- The City's ability to reduce its budget in the event of a downturn.

Risk interdependency. Risk interdependency refers to the relationship between the different risk factors. To illustrate, if two risks are highly dependent, then there is a strong likelihood that both will occur at the same time. If two risks are independent there is no particular reason they should occur at the same time. Examining Exhibit 5.1, the major risk dependency is between general revenue instability and the potential for the closure of a major employer as both are highly related to an economic downturn. The two remaining risks in Exhibit 5.1, extreme events and accrued sick leave, appear to be

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highly independent risks – the occurrence of either of these risks have little to do with the occurrence of other risks.

Where risks are highly dependent it is wise to hold reserves for the full amount of implied reserve amount for each dependent risk factor because if one happens it is likely the other one will happen. Where risks are independent and the risks have a low probability of occurring it may not be necessary to hold the full amount of implied reserves for each risk because one shared reserve for multiple risk factors that is less than the total implied reserve amounts of the individuals risks will probably be sufficient to protect the City.

Risk's probability of occurring. Some risks have a low probability of occurring, but have extreme consequences if they occur. The closure of a major employer is the leading example of this, and the extreme events risk also falls into this category. Some risks are almost certain to occur, but the consequences are not necessarily so severe. The accrued sick leave liability, for instance, is certain to occur and the City knows the impact. General revenue instability is also certain to occur and the impact to the City in the past has been manageable. When risks are likely to occur, it is wise to hold full implied reserve amount. When risks have a low probability of occurring it is possible to hold less than the implied reserve amount if the low probability risks are independent of each other. The odds that these risks occur at the same time are very small so the City could elect to not hold reserves large enough to cover all low probability risks.

City's ability to reduce budget in the event of downturn. In Section 3, the implied reserve amounts for revenue instability for both general revenue instability and the closure of a major employer were both reduced by the amount of the City's ability to reduce its budget. As we have seen in this sub-section, these risks could have some important interdependencies. This means the City could very well experience both risks at the same time, but cannot reduce its budget twice! Hence, this must be taken into account in the final reserve target.

B. Recommended Reserve Target for Sharonville

If we consider the risks to have high degree of dependency the City should reserve between \$8.2 million and \$9.2 million for the General Fund. The \$8.2 million accounts for deferring capital expenditures in the event of a revenue decline, whereas the \$9.2 million does not. In the Fire Fund, the range is \$3.5 million to \$3.8 million, depending on how high the City wants to set its reserve target for the accrued liability. For both funds, the potential for reduction in the City's budget is only accounted for once. The numbers presented in this paragraph represent a more "risk averse" approach to reserves.

The City could also reasonably consider a lower reserve target than is suggested in the paragraph above for two reasons: 1) the extreme event risks and employer closure risks are independent and both low probability events and 2) the implied reserve target for general revenue instability accounts for some of the same impact that the City would experience should a major employer close so adding both together does probably "double count" some risk. Reducing the reserve target by \$1 million for the General Fund and \$300,000 for the Fire Fund would not seem to be imprudent, but would represent a higher risk approach.

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Hence, the City should choose a reserve target for its general fund between \$7.2 million and \$9.2 million. This equates to a reserve equal to about 41 percent and 52 percent of the City's General Fund revenues, respectively. For the Fire Fund, the reserve target should be between \$3.2 million and \$3.8 million, which would be about 42 percent and 50 percent of fund revenues, respectively.

To help the City make a more informed consideration of this range of possibilities, Exhibit 5.2 provides a table of general fund balances as a percent of general fund revenues for a series of smaller Ohio cities that rely heavily on the income tax.¹⁶ A couple of points should be made about Exhibit 5.2 in order for the reader to fully understand its meaning. First, "fund balance" is an accounting term that describes the difference between the assets and liabilities in the General Fund. "Reserves" (which are the main topic of GFOA's analysis for Sharonville) are the portion of fund balance that is set aside, by city council policy, as a hedge against risk. It is impossible to tell from accounting records what portion of fund balance these cities regard as their "reserve" or even if they have formally identified a reserve amount at all. Second, the table includes both "unassigned" and "unrestricted" fund balances. These are accounting terms that describe how constrained a municipality is in its potential use of fund balances. To simplify, "unassigned" is the least constrained category. All of the unassigned fund balances should, technically, be available for use as a risk-mitigating reserve because there are no constraints placed on them. "Unrestricted" includes "unassigned" plus other more constrained categories where the constraint is self-imposed by the municipal government. It excludes categories where the constraints come from outside entities. Some cities place self-imposed constraints on their fund balances where some of the fund balance would be committed to use as an emergency reserve. Hence, it could be that unrestricted fund balance is also available for use as a risk-mitigating reserve. Unfortunately, it is impossible to tell from a balance sheet the exact nature of the constraint.

Exhibit 5.2 – Fund Balance as a Percent of General Fund Revenues for a Sample of Ohio Cities

	Population	2012 General Fund Revenue	Income Tax as a % of GF Revenue	3-Year Avg Fund Balances as a Percent of General Fund Revenue	
				Unassigned	Unrestricted
Blue Ash	12,114	\$38,249,531	74%	72%	73%
Solon	3,348	\$36,105,377	72%	60%	65%
New Albany	8,255	\$13,163,037	65%	70%	72%
Pickerington	18,408	\$7,799,341	40%	40%	47%
Beachwood	11,953	\$39,758,655	63%	59%	65%
Sharonville	13,521	\$14,059,366	84%	40%	43%

Despite the limitations described in the preceding paragraph, Exhibit 5.2 does provide some insight into the resources these cities have chosen to keep on hand above and beyond what is required for annual budget appropriations. Interestingly, Sharonville currently has the lowest reserve levels of the cities in

¹⁶ Cities were selected for comparability with Sharonville.

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the comparable group but the highest reliance on income tax. This suggests the City might give stronger consideration to a target closer to the higher end of the recommended range of reserves.

As a final input into considering the range of reserve targets, the City should consider two factors that are relevant to sizing a reserve:

- **Government size:** As a smaller municipality, Sharonville will generally have more vulnerability to all types of risk because it has a less diverse tax base, less diverse geography, and less diverse resources to draw upon. This suggests a reserve at the higher end of the range.
- **Borrowing capacity:** The City does not have significant debt and has not accumulated large backlog of outstanding asset maintenance requirements. Hence, the City has more financial flexibility than municipalities with more debt and/or accumulated maintenance requirements. This suggests that the City does have the capability to assume some risk with lesser reserves since debt might provide an alternative method of financial flexibility if the City needs to access it.

In conclusion, to zero in on a final reserve target GFOA recommends that the Sharonville Finance Committee and staff have a conversation about their risk appetite. A very low risk appetite should suggest that a reserve closer to 52 percent for the General Fund and 50 for the Fire Fund and would be safer for the City. If the City has a higher risk appetite it would adopt a reserve target closer to 41 percent for both funds. The City could also adopt a target between these two poles. The City could adopt a target in the form of a range in order to provide itself with a little more flexibility – for example, 50 percent to 55 percent of General Fund revenues. In short, there is no one “correct” answer as the final target is product of the City’s willingness to assume risk.

C. Policies to Support the General Fund Reserve Strategy

This sub-section presents ideas for formal policies that Sharonville may wish to adopt that would support the City’s reserve strategy.

General Fund Reserve Policy

The City should adopt a formal general fund reserve policy. A policy would accomplish the following:

- Memorialize the final reserve target in a document that receives formal council approval.
- Officially establish the intent of the City to maintain the target level of reserves.
- Describe the acceptable uses of reserves. This prevents the reserves from being used inappropriately and, thus, degrading the City’s risk mitigation capabilities. A critical component of this type of policy is to describe how reserves can be used to counteract a reduction in revenues. While reserves could be temporarily used to pay for employee compensation or other on-going expenses, this should only be done in the context of a multi-year plan to restructure the City’s existing budget to reach a state of structural balance. Hence, reserves should be used to “make a soft landing” in the event of a downturn, not just to delay inevitable restructuring.
- Describe who is authorized to use the reserves.
- Provide guidance on how to replenish reserves back to target levels, when necessary.

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Asset Management Policy

An asset management policy will help support the City's reserve strategy because acquisition and maintenance of capital assets is a major draw on the City's resources. A policy will help the City improve upon its already strong capital planning practices and standardize its approach to asset maintenance.

One-Time and Volatile Revenue Policies

A one-time revenue policy directs that non-recurring sources of revenue (e.g., asset sale, settlement from a lawsuit that the City wins, etc.) be used only for non-recurring purposes (e.g., pay down debt, buy a capital asset,¹⁷ etc.). One-time revenues are, by definition, undependable so should not be used to fund expenditures of a recurring nature. A volatile revenue policy takes concept a step further by declaring unusually high yields from volatile revenue sources as the equivalent of a one-time revenue. For example, if the City has a record-breaking year for the income tax (as might occur during a cyclical economic expansion) it would be unwise to consider the resulting revenue as the new baseline for the amount of income tax revenue the City should expect in future years and to plan spending accordingly. Rather, the revenue above and beyond what might be considered "normal" should be used for non-recurring expenditures. To illustrate the value of such a policy, one could imagine that the experience shown in Exhibit 3.6 would be much less difficult to navigate if the extra revenues received during the years 2005 to 2007 were not used to fund recurring expenditures.

Here is an example of a volatile revenue policy:

It is not prudent to allocate income tax revenue that exceeds the normal growth rate (defined as the average annual growth rate over the last ten years) to ongoing programs. Therefore, income tax revenues that exceed the normal growth rate should be used for one-time expenditures or to increase reserves for the inevitable economic downturns.

Structurally Balanced Budget Policy

A "balanced budget" is often defined as one where sources equal uses. Such a budget might be balanced in a single year, but might not be sustainable. For example, if expenditures on the salaries and benefits for permanent employee positions are paid for with the revenues from the sale of an asset a government will soon face financial challenges. A structurally balanced budget policy provides a more rigorous definition of a balanced budget, one where recurring revenues equal recurring expenditures and non-recurring revenues equal non-recurring expenditures. A structurally balanced budget policy supports a reserve policy because it makes it less likely that the City will find itself in a situation where it is unable to cover its recurring expenditures in a given year and, thus, have to draw upon its reserves.

¹⁷ Assuming that the future operating and maintenance costs of the asset can be handled with recurring revenues.

GFOA Reserve Analysis for the City of Sharonville

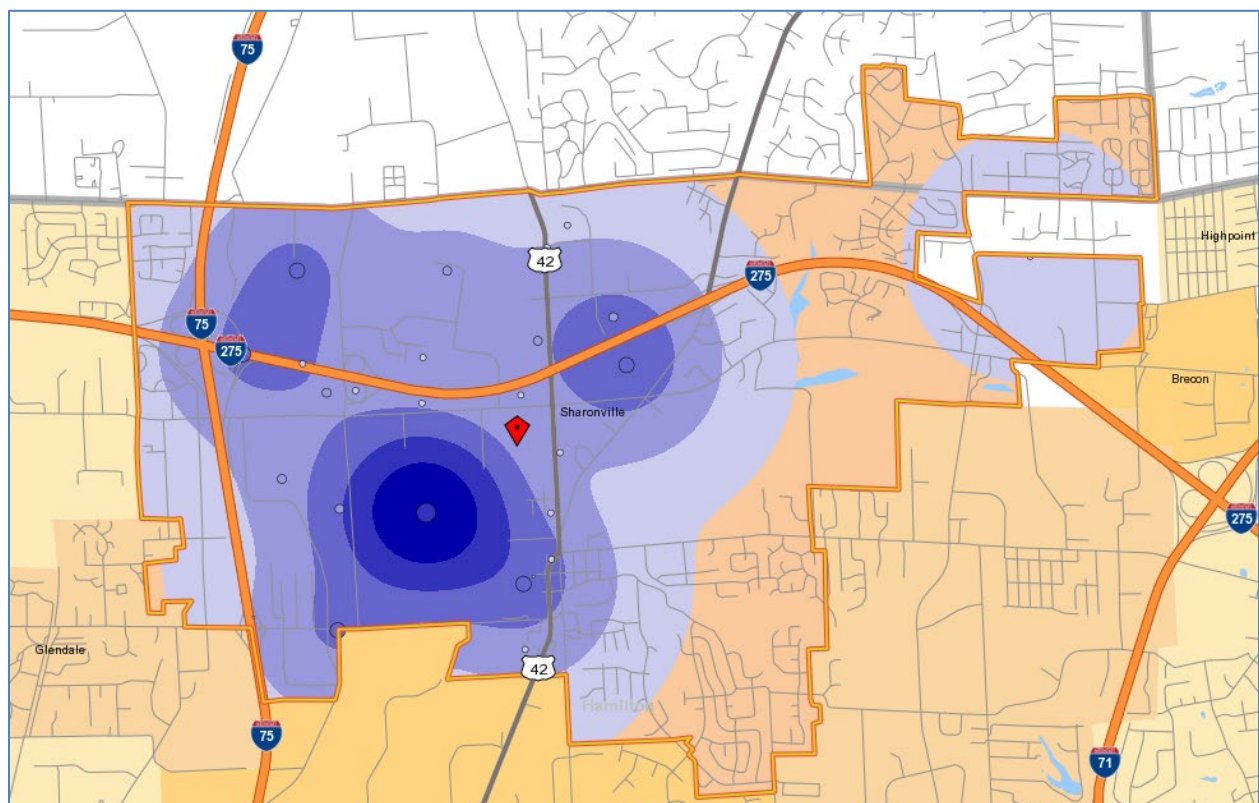
Appendix 1 – Employment Concentration Heat Maps

The following maps are generated by the US Census Bureau and show the concentration of employment in the community.

Increasingly dark areas of purple indicate where employment is concentrated. Both Sharonville and Moraine appear to have one area of primary concentration, but Sharonville has two outlying areas that also have significant concentration. This should help lessen the impact of the closure of any single employer.



Concentration of Employment in the City of Sharonville, 2011



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Concentration of Employment in the City of Moraine, 2007

