



CITY OF LANSING, MICHIGAN PENSION PLAN ANALYSIS

September 26, 2017

 Segal Consulting

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City of Lansing, Michigan

Pension Plan Analysis

September 26, 2017

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September 26, 2017

Mayor Virg Bernero
City Hall
124 W Michigan Avenue
Lansing, MI 48933

Re: Final Pension Plan Analysis Report

Dear Mayor Bernero:

We are pleased to present the final report of Segal's analysis of the City of Lansing's pension plans. This analysis provides a detailed review of the City's pension plans, including the actuarial assumptions and methods used in determining the City's contributions. This report includes the following:

1. ***Methods and assumptions review*** – an analysis of the actuarial assumptions and a review of the actuarial methods utilized in determining the funded status and accrued liability for compliance with generally accepted actuarial principles.
2. ***Peer group benchmarking*** – a detailed comparison of the City's plans with other cities' plans in the State of Michigan.
3. ***Plan design and funding approach alternatives*** – a discussion of other means of retirement benefit delivery and alternate strategies for funding the plans.

This review was conducted under the supervision of Kim Nicholl, a Fellow of the Society of Actuaries, a member of the American Academy of Actuaries, and an Enrolled Actuary under the Employee Retirement Income Security Act (ERISA). This review was conducted in accordance with the standards of practice prescribed by the Actuarial Standards Board.

The assistance of the City of Lansing's staff is gratefully acknowledged.

We appreciate the opportunity to serve as an independent actuarial advisor for the City of Lansing and we are available to answer any questions you may have on this report.

Sincerely,



Kim Nicholl, FSA, FCA, MAAA, EA
Senior Vice President, Public Sector
Retirement Practice Leader



Brad Ramirez, FSA, FCA, MAAA, EA
Vice President and Actuary



Matthew A. Strom, FSA, MAAA, EA
Vice President and Actuary

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Enclosure

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1 Executive Summary

The City of Lansing (City) is seeking analysis and recommendations for potential ways to mitigate the cost and liability of its outstanding pension obligations and retiree healthcare and other post-employment benefits (“OPEB”) obligations, both present and future.

Segal Consulting (Segal) was engaged by the City to perform this analysis. This report will concern itself with the pension plans currently sponsored by the City. The analysis of the OPEB plans will be provided under separate cover. As of the December 31, 2015 actuarial valuations, the City sponsors two defined benefit pension plans:

- Police & Fire Retirement System (“Police and Fire”)
- Employees’ Retirement System (“Employees”)

The City’s actuary recently performed a five-year experience analysis of both Plans in order to improve the accuracy of the Plans’ actuarial valuation assumptions. This study resulted in an increase in projected contributions for both Plans.

The objectives of this study are as follows:

- Review the actuarial assumptions used in the valuation of the City’s retirement plans
- Evaluate the City’s current pension benefit plan designs, including the efficiency of benefit delivery
- Discuss appropriate plan design/structure alternatives to the structure currently in place, including hybrid plans, defined contribution plans and other alternatives
- Benchmark the design and funding aspects of the pension plans relative to a peer group
- Develop alternative funding approaches to increase financial stability of the City’s retirement plans
- Develop recommendations for the City’s consideration

Segal reviewed the plans’ actuarial assumptions and methods. We performed this analysis based upon the plans’ valuation reports as prepared by the plans’ actuaries, Boomershine Consulting Group, LLC (“Boomershine”). As part of this review, Segal did not independently replicate Boomershine’s calculations, and can only comment on the assumptions and methods as presented in the valuation reports and other supplemental material. Segal did not include an analysis of detailed actuarial data and this report is limited to review and reliance on existing actuarial reports and experience studies.

In addition, we reviewed the Actuarial Assumption Review and Experience Studies covering the period January 1, 2012 through December 31, 2015, which was prepared by Boomershine after the most recent 2015 valuations. The assumptions and methods recommended in these studies

were not incorporated into the valuation reports that we reviewed. However, we have noted where the experience study recommendations address the issues we observed.

The assistance of the City in creating this report is gratefully acknowledged.

The key findings of this report are below along with recommendations of areas that need additional review.

- The current actuarial valuation assumptions and methods appear to be reasonable and comply with relevant actuarial standards of practice. We recommend the following:
 - Review the inflation assumption and give consideration to whether the assumption should be lowered – the experience studies recommended lowering the inflation assumption from 3.10% to 2.75%. The Employees’ Plan lowered this assumption to 2.925% with the stated intention of lowering the rate to 2.75% next year. The Police and Fire plan lowered this assumption to 2.85% with the stated intention of lowering the rate to 2.75% next year.
 - Monitor the investment return assumption, particularly given that the inflation assumption is on the high side of reasonableness – the experience studies recommended lowering the investment return assumption from 7.60% to 7.25%. The Employees’ Plan lowered this assumption to 7.40% with the stated intention of lowering the rate to 7.25% next year. The Police and Fire plan lowered this assumption to 7.35% with the stated intention of lowering the rate to 7.25% next year.
 - Consider updating the mortality assumptions to the most recent Society of Actuaries’ mortality and generational mortality improvement scale – the experience studies recommended updating the mortality tables.
 - Consider whether a corridor around the market value of assets should be included in the asset smoothing method
- The City’s pension plans are similar to the plans of the peer group, and are funded on a similar basis. The City’s pension multiplier for new participants is lower than those within the peer group for defined benefit plans but is supplemented by a Defined Contribution plan. The City’s plans use similar assumptions and funding methods to those in the peer group, with the City’s plans’ assumptions being slightly more conservative than the overall group.
- There are many items to consider when transitioning to a defined contribution plan (DC) or a hybrid plan. While defined benefit (DB) plans are a more efficient mechanism for delivery of pension benefits, the contributions can be volatile due to investment performance and demographic changes, as the employer retains these risks. DC contributions are typically fixed as a percentage of payroll, and the employee bears the investment and demographic risks. Hybrid plans share these risks between the employer and employee. Before considering any changes to the current systems, it is important that the City balance the risks of their benefit plans with the goals of the City and its stakeholders.
- Retirement benefits are one of the tools that employers can use to manage its workforce. Plan design can attract, motivate, and retain talent. Plan design can also encourage individuals to terminate employment or to retire. Employers need to assess their current and future workforce needs and then design retirement arrangements that support those needs. Generally, DB plans encourage longer-term employment but may not be as useful as DC plans in attracting workers who do not intend to remain with an employer for a long period

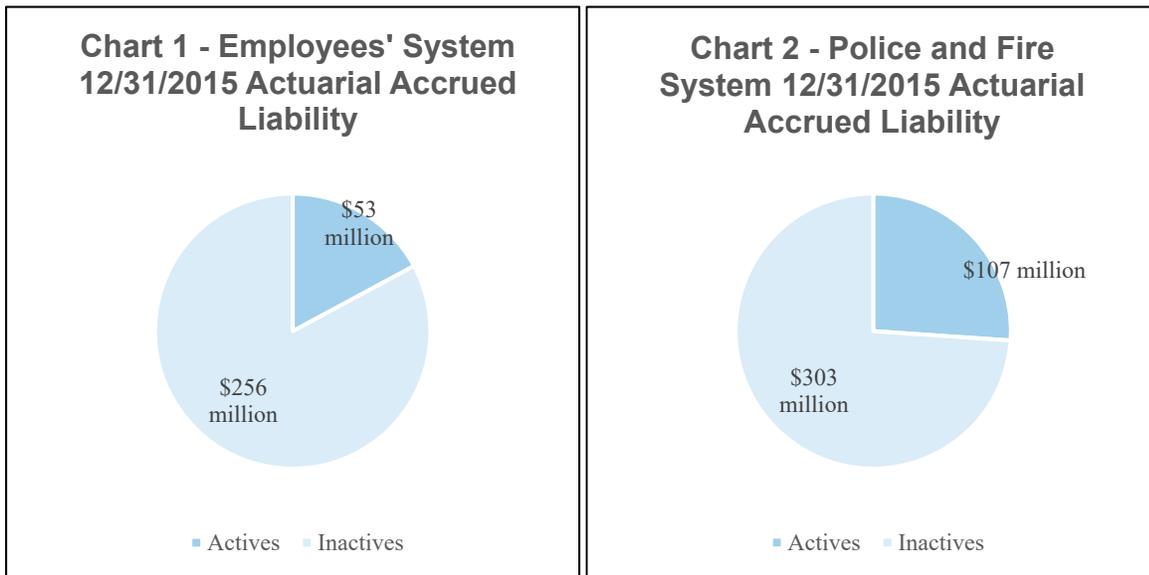
and desire portability. Hybrid plans can be attractive options as they combine the attributes of both DC and DB plans. Knowing what the workforce goals are is essential to a viable retirement benefit strategy, and if changes are needed to the overall retirement structure.

- The pension plans' unfunded liabilities represent benefit promises already made to active and retired employees. As of December 31, 2015, these unfunded liabilities are amortized over a closed 26-year period, decreasing by one year each year to an ultimate period of 15 years; at which point the amortization period will become a rolling 15-year amortization period. The experience study for the Employees' Plan recommends changing the ultimate period to 10 years. The experience study for the Police and Fire Plan recommends retaining the 15-year ultimate period. This means that the amortization period will remain at 15 years for the Employees' Plan and 10 years for the Police and Fire Plan and the plans will **never** be fully funded. Contributions toward the unfunded liabilities are based upon a payroll growth assumption of 3.10% per year. This means that the payments toward the unfunded liabilities will increase by this amount each year, which is intended to mirror the actual growth in member payroll. The payroll growth assumption and the actual increase in payroll each year determine how quickly the unfunded liabilities of the plans are amortized. The experience studies recommend lowering the payroll growth assumption to 2.75%. This assumption should be closely monitored and consideration should be given to adopting a funding policy that targets 100% funding over a reasonable period.
- If the existing plans were to be completely closed to new members, with new hires entering a DC plan, the closed group's active payroll would decrease. Since the current plans are being funded as a percent of payroll, including payroll for future members, this would result in an immediate need to accelerate DB contributions. Alternatively, the City could adopt a different funding policy not related to payroll.
- The unfunded liabilities of the plans would not be affected by transitioning to a DC or hybrid plan. Any plan changes would only affect active members' future benefits. The normal cost represents the value of benefits accruing for active members. A portion of the normal cost is funded by member contributions. The remaining portion is funded by the City. The City's normal cost rate is 7.2% of payroll for Employees' and 14.2% of payroll for Police and Fire. The normal cost portion of the City's contribution is \$1.7 million for Employees' and \$3.8 million for Police and Fire for a total of \$5.5 million. Reductions in future benefits for active members would lower the City's normal cost contributions of \$5.5 million. As an example, if the value of benefit accruals were reduced by 10% for all active members, the reduction in the City's contribution would be \$550,000.
- The unfunded actuarial accrued liability, which totals \$250 million, will not be affected by reducing new members' benefits. This liability will need to be paid by the City.
- The City could accelerate its contributions to the pension plans, which would reduce future contributions. However, like other Michigan municipalities, the City of Lansing is challenged in its revenue structure, which limits its ability to do so.

2 Background

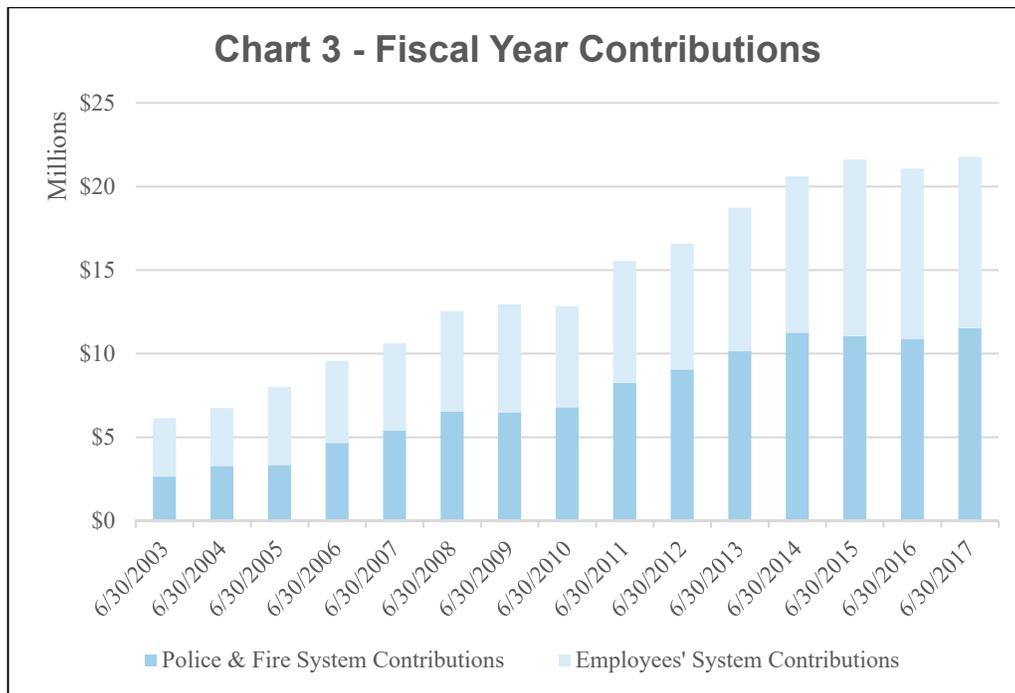
The Employees' Plan has a Funding Ratio (actuarial value of assets divided by liabilities) of 57.0%. The plan has 981 inactives and 371 active participants, and over 80% of the Plan's liability is devoted to inactive members. As a result, a significant portion of annual contributions is made toward benefits earned in previous years. Of the total projected City contribution of \$10.2 million for 2016, only \$1.7 million represents benefits earned for actives during the year.

The Police and Fire plan faces similar challenges. The Funding Ratio is 71.3%, and inactives represent approximately 75% of the Plan's liability. Of the total projected City contribution of \$11.5 million, only \$3.8 million represents new benefits earned.



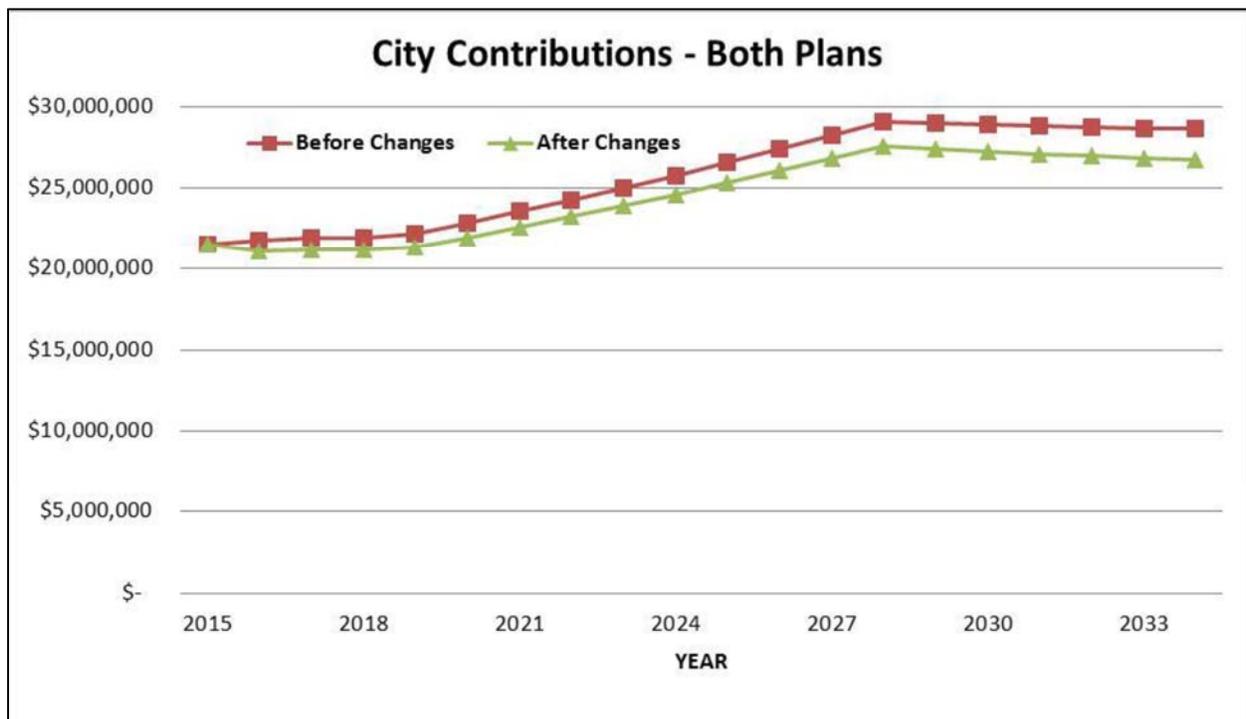
Because the majority of liability is devoted to inactive benefits, the total elimination of benefits for actives going forward would result in a reduction of \$5.5 million per year. However, the remaining unfunded liability would remain and continued payments would be necessary.

Contributions to fund these and retiree health obligations have increased dramatically over the last ten years, and currently comprise 35% of the city's budget. Projections indicate that the contributions will increase significantly for the next several years. As with other cities across the country, this presents a challenge in light of cuts in state funding and legal restrictions on revenue growth.



The City has made a number of changes to collective bargaining agreements that have impacted the Plans, including increasing employee contributions and lowering the retirement benefit formula. Because most of these changes apply to new hires after a certain date, the cost savings are recognized slowly over time as active employees are replaced by those subject to the new provisions.

Chart 4 - Projected Contributions



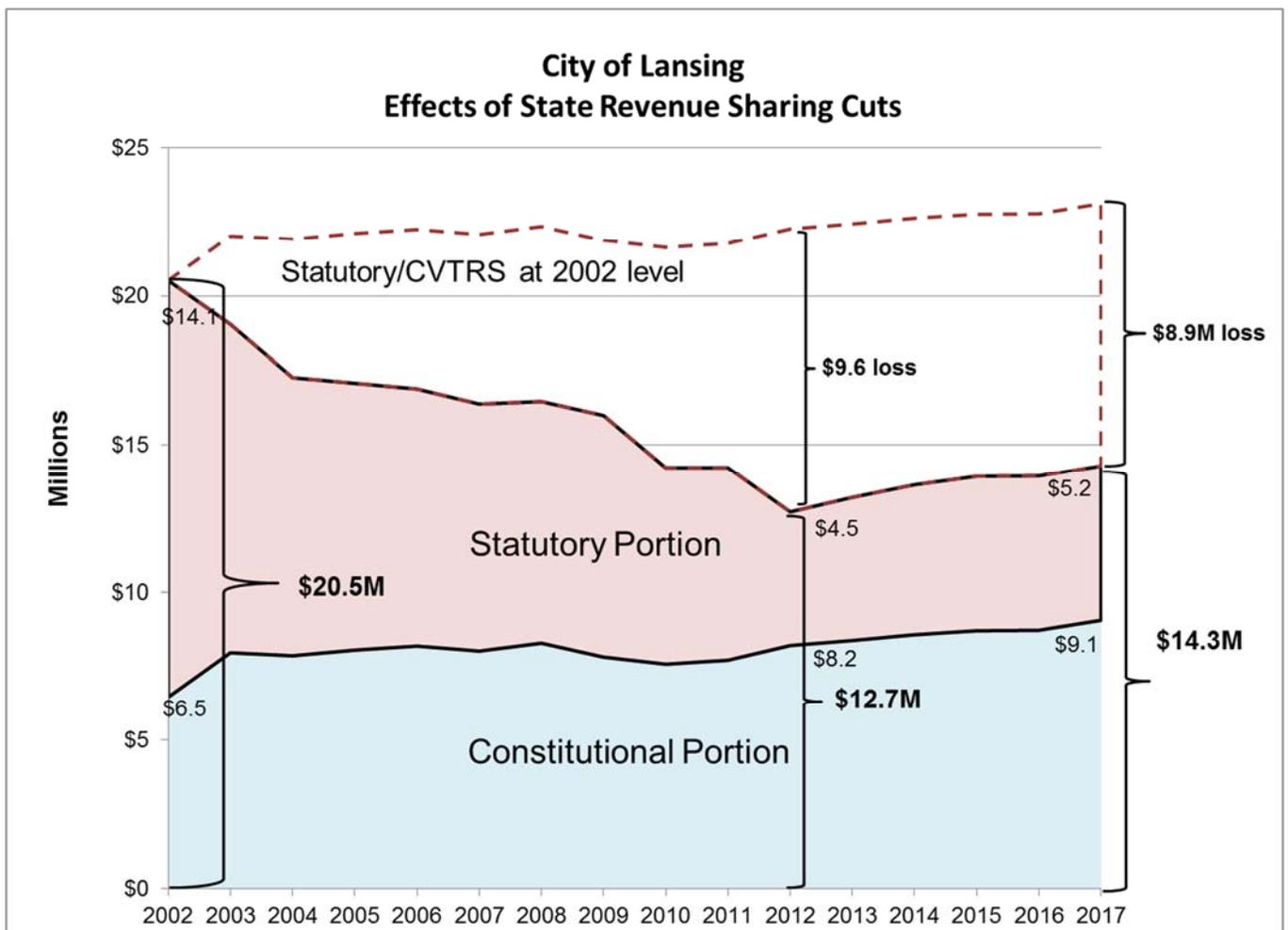
Source: "The City of Lansing Employees' Retirement System and Police and Fire Retirement System Analysis of Recent Benefit Changes" by Boomershine Consulting Group, March 2, 2015

City Resource Challenges

The City of Lansing, like other Michigan municipalities, is challenged in its revenue structure. The structure for Michigan's municipal funding is based on centralization of taxation and revenue diversification at the state level, with municipalities having limitations on ability to raise revenues. A prime example is sales taxes: in many other states, municipalities can levy sales taxes; in the state of Michigan, only the state is allowed to levy sales tax. This structure was predicated on revenue sharing by the state with its municipalities.

Preceding and through the Great Recession, as the State of Michigan ran into its own budgetary challenges, the statutory portion of revenue sharing to municipalities by the state was reduced by approximately \$8.1 billion. For the City of Lansing, these cuts have amounted more than \$6 million in real dollars *annually* for the City, and almost \$9 million annually when adjusted for inflation, or over \$104 million from 2002-2017.

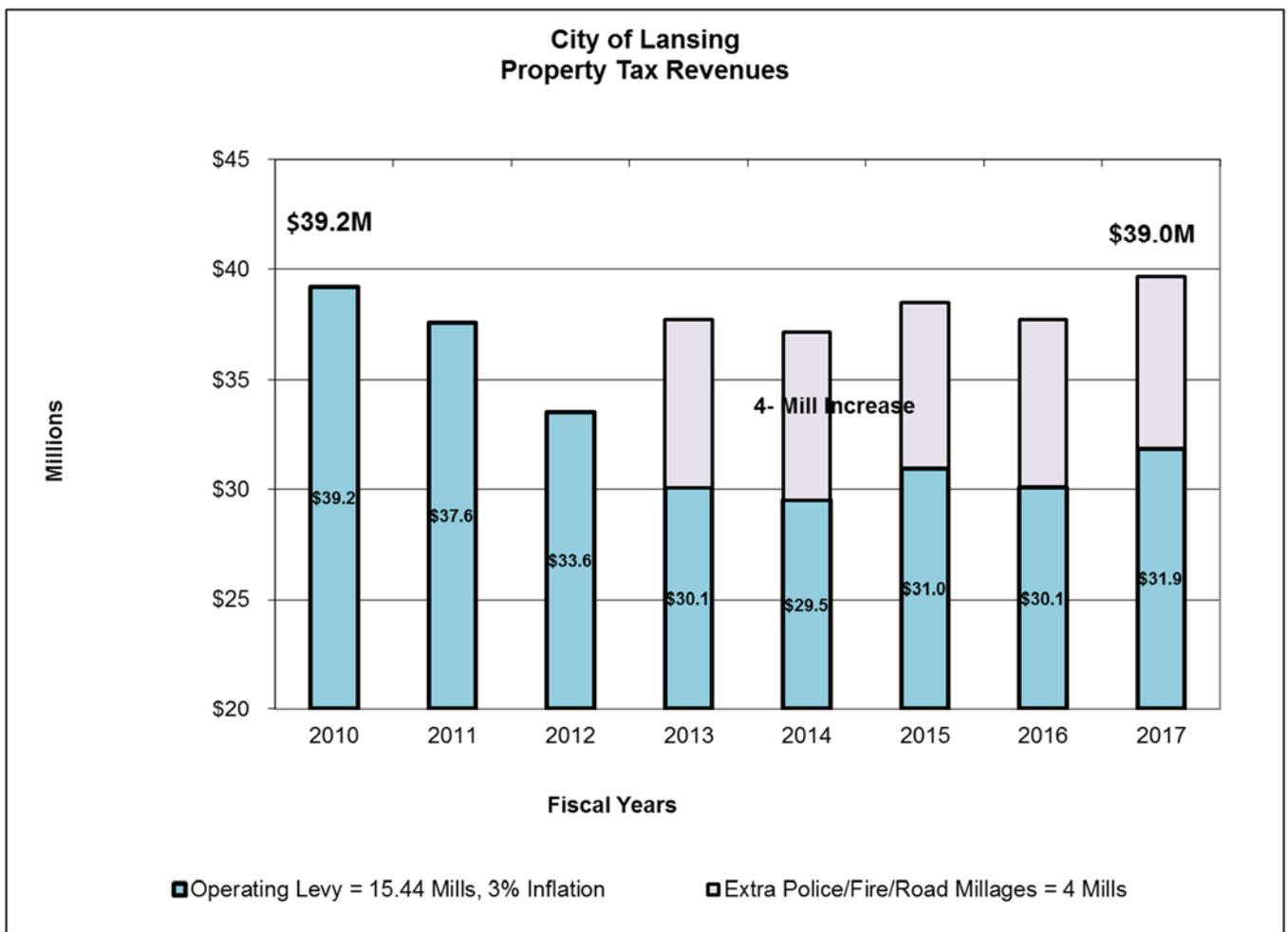
Chart 5 – Effect of State Revenue Sharing Cuts



At the same time, due to limitations by the state Headlee Amendment and Proposal A, the City’s (and other municipalities’) largest General Fund revenue source, the property tax, is limited in growth by the lesser of the rate of inflation or five percent.

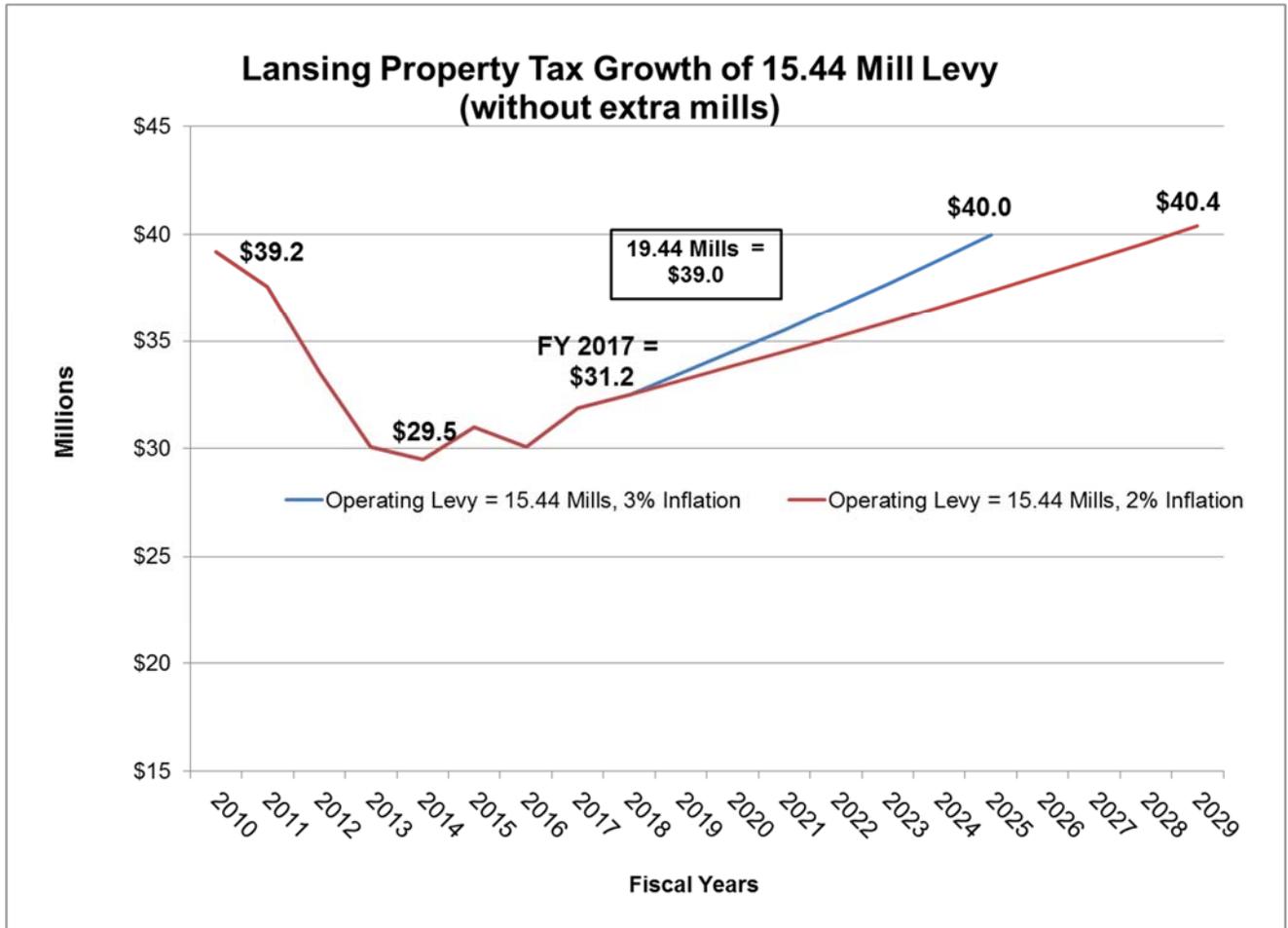
During the Great Recession, as property values declined, Lansing’s property taxes decreased by 25%, or \$9.7 million, over a four-year period, resulting in a four mill voted property tax increase for police, fire, and roads. While that four mill property tax levy substantially offset that loss, it brought the City’s operating levy up to 19.44 mills, which within .56 mills of the 20-mill maximum allowed for home-rule cities in the State of Michigan. As a result, the City is unable to increase its operating property tax levy much further.

Chart 6 – Property Tax Revenues



As demonstrated in the following chart, because of the above-stated state limitations on property tax revenue growth from the state Headlee Amendment and Proposal A, the City anticipates property taxes to increase only 2%-3% over the next several years and that pre-recession property tax revenue levels, net of the extra four mills, will not be reached until 2025 to 2028.

Chart 7 – Property Tax Growth



These funding cuts and revenue constraints have generally affected the state’s urban core communities more than others. Urban core cities, like Lansing, tend to be older communities, having aged infrastructure; tend to be built-out with limited undeveloped land; tend to have higher poverty rates; and tend to have higher legacy (pension and retiree healthcare) costs. These factors are true for the City of Lansing, which was incorporated in 1859 and has twice the number of retirees as current employees.

In response to these challenges, leading up to and during the Great Recession, the City enacted many different changes in city programs, staffing, and organization, including:

- Reducing the City’s workforce by 30% since FY 2006, from 1,220 to 867
- Reducing City pension and retiree healthcare cost growth by negotiating increases in employee health insurance premium sharing, healthcare plan changes, and pension contributions
- Reducing City health insurance costs with a wrap program for Medicare-eligible retirees
- Closing 3 fire stations and eliminating associated costs

- Closing Waverly and Red Cedar Golf courses
- Closing Miller Road Senior Community Center
- Closing Washington Ice Dome and Scott House
- Consolidating functions within the City (grounds maintenance, engineering, fleet maintenance, parking enforcement, fire/building inspections)
- Consolidating functions with other governments (911, dive team)
- Entering into cooperative agreements with other governments (police and fire training, purchasing, economic development)
- Expanding mutual aid agreements and shared services studies with adjoining municipalities
- Transferring management of Sycamore Driving Range and Fenner Nature Center to non-profits
- Eliminating leased space by consolidating police Patrol and Investigations Divisions
- Increasing fees
- Implementing new technology to improve efficiency (including cash receipting, code compliance, financial system upgrades, payroll system, computerized traffic ticket system, E-filing for income taxes)
- Implementing energy efficiency measures in City buildings
- Instituting a voter-approved 4.0 mill property tax increase to mitigate further reductions to police, fire and road services

Noteworthy is the fact that the City's FY 2018 General Fund Budget is still less than the budget proposed by former Mayor Hollister in **FY 1999**, when adjusted for inflation.

During this time, the City also worked with its unions to reduce the growth of pension and retiree healthcare costs. A recent actuarial study estimates that these efforts have reduced projected costs to by over **\$200** million over the next forty years. However, the challenge remains in the projected growth of these costs, in combination with its aging infrastructure, reductions in revenue and revenue constraints in the next fifteen-to-twenty years.

As previously noted, these challenges are not unique to the City of Lansing, especially within the State of Michigan.

3 Assumption Review

The valuation of a defined benefit pension plan is dependent upon assumptions of future experience. These assumptions are utilized in order to project the benefits that will be paid from the system. Using these projections, organizations make contributions under a funding policy that will timely fund the benefits as they are payable.

It is important to note that the assumptions used in the valuation do not affect the benefits that are promised to participants. Ultimately, the “true cost” of a pension plan will be the benefits that are paid to its participants. Assumptions are used, along with the plan’s funding policy, to determine how to fund the pension plan over time in accordance with the governing entity’s budgetary concerns and risk profile.

Assumptions are the actuary’s best estimate of future events and are rarely perfectly accurate. It is important that the assumptions used in these calculations are monitored and modified as appropriate so that the true cost of the benefits paid is being accurately measured.

For the purposes of this study, we evaluated the following reports:

- City of Lansing Employees’ Retirement System Actuarial Valuation for Funding and Contributions as of December 31, 2015 (prepared October 2016)
- City of Lansing Police and Fire Retirement System Actuarial Valuation for Funding and Contributions as of December 31, 2015 (prepared October 2016)
- City of Lansing Employees’ Retirement System Actuarial Assumption Review and Experience Study Covering January 1, 2012 through December 31, 2015 (prepared December 2016)
- City of Lansing Police and Fire Retirement System Actuarial Assumption Review and Experience Study Covering January 1, 2012 through December 31, 2015 (prepared December 2016)

The reports were produced by the Boomershine Consulting Group (“Boomershine”), the plans’ actuaries.

Segal’s analysis of the assumptions and methods was based upon those reported in the valuation reports and recommended in the experience study reports as prepared by Boomershine. Segal did not independently perform a replication of these valuations or the analysis of experience.

There are two types of actuarial valuation assumptions: demographic and economic. Demographic assumptions are used to model the expected individual behavior of plan participants and include assumptions for retirement, disability, withdrawal, and mortality. Economic assumptions are used to model more global financial effects, such as rates of inflation, rates of return on assets, and salary increases.

Inflation Assumption

The inflation assumption underlies every other economic assumption. It is important that the inflation assumption be consistent throughout all of the economic assumptions. In fact, most actuaries start the economic assumption-setting process by specifying the inflation assumption and then building the other economic assumptions from that amount (referred to as the “building-block method”).

The inflation assumption may also directly affect other valuation elements, including cost-of-living increases and the amortization of the unfunded liabilities. If plan cost-of-living increases are tied to inflation, the assumption will determine the amount of projected increases in retirement benefits each year. The Plans’ cost-of-living increases are linked to actual inflation.

The inflation assumption has been reduced from 3.10% to 2.925% for the Employees’ Plan and from 3.10% to 2.85% for the Police and Fire Plan. These assumptions are consistent with historic averages. However, recent years have seen historically low inflation--the CPI-W increased approximately 1.8% per year from 2006-2016. Horizon’s 2016 Survey of Capital Market assumptions indicates that the average median inflation is expected to be 2.31% over the next 20 years with expectations ranging from 2.00% to 2.80%. As of June 2016, the difference between the yields on US Treasury bonds with and without inflation indexing is 1.61%, which represents one measure of the financial market’s current expectation of inflation over the next 30 years. The 2016 OASDI Trustees Report uses three inflation assumptions to project its future financial status:

- Low inflation of 2.00%
- Moderate inflation of 2.60%
- High inflation of 3.2%

The median inflation assumption for the 160 public pension plans that are included in the Public Plans Database (collected by the Center for Retirement Research at Boston College) is 3.05%.

The experience studies recommend a decrease to the inflation assumption, from 3.10% to 2.75%, which we believe are reasonable. The plans’ inflation assumptions have been reduced to 2.92% for the Employees’ Plan and 2.85% for the Police and Fire Plan and appear to be reasonable. We understand that the boards’ intent is to lower the inflation assumptions to 2.75% in 2018. Because of the importance of the inflation assumption, we recommend that these assumptions be evaluated on an ongoing basis.

Investment Return Assumption

The investment return assumption is of key importance to the actuarial valuation. For public sector funding valuations, benefit payments are typically discounted at the same interest rate as the investment return assumption. In order for this discounting to be valid, the investment return assumption must be supported by the underlying asset mix of the fund. In other words, the rate of return of a pension plan’s assets over the projection period should match the plan’s rate of return assumption.

The investment return assumption has a large effect on plan funding. A drop in the investment return assumption corresponds with an immediate increase in the plan's liabilities. Typically, a 1% decrease in the assumption results in an immediate 10%-15% increase in Actuarial Accrued Liability.

Using a relatively high investment return assumption will result in lower liabilities and lower current contributions. The fund's projected market returns will be expected make up for the lower contributions. However, if actual investment returns are lower than the assumption, the contributions will increase. Using a relatively low investment return assumption will result in higher liabilities and higher current contributions. The fund's higher contributions will be expected to make up for the lower projected returns. In addition, a lower investment return assumption may result from a desire for the plans to take on less risk in their investment portfolios.

There are significant risks in not meeting the investment rate of return assumption. If the plan consistently underperforms the assumed rate of return, funding will not occur in accordance with the plan's policy. Future contributions will need to be higher in order to balance the lower returns.

The City's investment return assumption has been reduced from 7.60% to 7.40% for the Employees' Plan and from 7.60% to 7.35% for the Police and Fire Plan. These assumptions are within industry standards as the majority of public sector pension plans use an investment return assumption between 7.00% and 7.75%. In recent years, many public sector plans have lowered this assumption in light of recent economic events. The City and its advisors should continue to carefully monitor returns to verify that the plans' asset mixes support the use of this assumption.

The experience studies recommend that the investment return assumption be lowered from 7.60% to 7.25% along with lowering the inflation assumption. We believe this assumption would be reasonable. The plans' investment assumptions have been reduced to 7.40% for the Employees' Plan and 7.35% for the Police and Fire Plan and appear to be reasonable. We understand that the boards' intent is to lower the investment return assumptions to 7.25% in 2018. Because of the importance of the investment return assumption, we recommend that these assumptions be evaluated on an ongoing basis.

Mortality Assumption

The assumptions for mortality attempt to accurately project how long plan members will live. Since defined benefit plans pay benefits until a retiree and/or beneficiary dies, increases in life expectancies result in benefits being paid for a longer period and increased liabilities.

Because only the largest pension plans are able to provide enough mortality exposure to develop their own assumptions, industry standard mortality tables are typically used for actuarial valuations. In addition, plans often use different tables for healthy and disabled members, reflecting the higher mortality observed for those that retire with a disability pension.

There have been significant improvements in mortality over the last several decades. It is common for actuaries to use mortality tables that have a built-in projection scale, so that mortality is assumed to improve over time. In fact, Actuarial Standards of Practice now specify that pension plan actuaries explicitly reflect the effects of mortality improvement in retirement plan valuations, unless there is a specific reason for not doing so.

The Employees' Plan uses the RP-2000 Combined Healthy Mortality Tables set back one year for females, with projection to 2023 using 50% of Scale BB. For disabled members, the corresponding Disability Tables are used with projection to 2008 using Scale BB.

The Police and Fire Plan uses the RP-2000 Combined Tables with Blue Collar Adjustments, with projection to 2029 using 50% of Scale BB. For disabled members, the corresponding Disability Tables are used with a five-year setback for males and projection to 2008 using Scale BB. Future improvements in mortality are anticipated by projecting these tables to 2021 (for Police and Fire) and to 2023 (for Employees) using 50% of Scale BB. Projection of the tables to a specific year will allow for some projection of future mortality, but not the total amount of projection that is implied by the Scale.

Since the previous experience study, the Society of Actuaries has published the RP-2014 mortality table as well as a generational mortality improvement scale (MP-2016).

We recommend that consideration be given to updating the mortality assumptions to a more recent mortality table and generational improvement scale. The experience studies recommend maintaining the current tables (RP-2000) and applying Scale BB in full to 2026. Based upon the data in the experience study, this table appears to allow for a reasonable margin for improvement. We believe that the recommended assumption is reasonable.

Asset Smoothing Method

Pension plans often use smoothing methods to dampen the short-term effects of asset returns. The Employees' and Police and Fire Plans use a five-year smoothing mechanism, which is the most common period used in the public sector.

As part of the asset smoothing mechanism, some plans apply an additional "corridor" so that the smoothed value of assets does not differ from the market value of assets by more than a set amount. A common example of a corridor would be 80% to 120%, meaning that the actuarial value of assets cannot be less than 80% of the market value nor more than 120% of market value. We note that no corridor is applied in the Employees' and Police and Fire plans asset smoothing method. However, the smoothing period is short enough that the application of a corridor would only occur in rare circumstances, such as the 2008 market crash.

Actuarial Standards of Practice specify that asset smoothing methods be unbiased, reflect market returns in a systematic matter, and result in an actuarial asset value that falls within a reasonable range of market value. The City's methodology satisfies these requirements.

The asset smoothing method is reasonable. Consideration may be given to the application of an 80% to 120% corridor.

Funding Method

In order to determine the Actuarial Accrued Liability, the actuary must apply a funding method to assign benefits to past and future service. There are several methods commonly used in this process. For the Employees' and Police and Fire Plans, the Entry Age Actuarial Cost Method is used. This method is the most commonly used allocation method in the public sector and results in relatively stable contributions as a percent of payroll.

The amortization period of both the Employees' and Police and Fire Plans is **partially** closed with 26 years remaining as of December 31, 2015. The partially closed amortization period means that the funding period will decrease each year, and according to the plans' funding policies, will decrease until the remaining period is 15 years at which point it will remain at 15 years. Closed periods have the feature that every dollar of unfunded liability will be retired by a certain date, although required contributions can become very volatile in the final years of the amortization period. This volatility can be managed through a funding policy that tracks the source of change in unfunded liability by year and amortizes each year's change in unfunded liability over a closed period.

The plans will use an open 15-year amortization period when there are 15 years remaining in the funding period (December 31, 2026). The experience study recommends changing the length of this period to 10 years for the Employees' Plan. Open amortization periods are often used in the public sector, but are not expected to fully amortize the unfunded liabilities by a specified date. An important concept in funding pension plans is "negative amortization".

When unfunded liability payments are made as a percent of payroll, the dollar amount of payments rise over time as the payroll base increases. Because smaller payments are made at the beginning of the payment period, the unfunded liability will increase for several years, then rapidly decrease in the last few years of the period. This is a result of the payments in early years not being sufficient enough to pay the interest accruing on the unfunded liability. While this type of payment stream is often used to fund public sector plans, it is important that stakeholders understand this effect.

Payments on the plans' unfunded liabilities are made using a projection of future payroll increases for the groups. This is done in order to reflect the growth of payroll over the payment period. The City's plans use assumptions of 2.92% and 2.85% annual payroll growth. This means that the current payment calculation assumes that total payroll will grow at a rate of 2.92% or 2.85% per year over the payment period. In years where total payroll growth is less than the assumption, payments toward the unfunded will be less than assumed. This will have the effect of increasing required payments in the future.

An alternative to funding the plans on a percent-of-pay basis would be to make payments on the unfunded liability on a "flat-dollar" basis. This method would amortize the unfunded with an unchanging payment over the period, similar to a home mortgage. Though the dollar amount would remain the same, the payments as a percent of payroll would decrease as the period goes on. This would have the effect of paying the unfunded liability more quickly, but would result in significantly higher payments in early years.

The assumption of 2.92% or 2.85% annual payroll growth (and 2.75% as recommended by the experience studies) is consistent with other entities in the public sector. As shown in the peer group analysis, the City's assumptions are lower than any of the comparable plans in the peer group. Because of the importance of this assumption to payments made on the unfunded liabilities, we recommend that this assumption be carefully monitored, particularly if payroll increases are expected to be lower than the assumption.

The City should be aware of the effect of the negative amortization inherent in making unfunded liability payments as a percent of payroll.

We recommend that the plans evaluate the use of an open amortization period when the plans reach the 15-year (or 10-year) open funding period in 2026. We recommend that consideration be given to adopting a funding policy that targets 100% funding over a reasonable time period. Due to the importance of the payroll growth assumption on unfunded liability payments, we recommend that it be carefully monitored.

Retirement Rates

The retirement rates used in the valuation appear to be reasonable. We note the following points for consideration.

- The retirement assumptions for the Employees' System are split by group (UAW/Others) and by age. Many public sector systems see higher retirement rates in the early years of retirement eligibility, especially in the first year. If this behavior is being observed, the actuary may consider applying an ultimate rate for the first year of eligibility to reflect these retirements.
- It appears that the City has mandatory retirement ages for Police (60) and Firefighters (70), but it is unclear from the report whether these age limits are being taken into account in the valuation assumptions. If these limits are being applied, they should be noted in the report.

The experience studies recommend changes to some of the rates currently used and the data indicate that the new assumptions match recent experience. We believe that the recommended assumptions appear to be reasonable.

Other Assumptions

The other assumptions used in the valuations appear to be reasonable. We note the following:

- The Employees' System and the Police and Fire System both provide special benefits for active deaths that are incurred in the line of duty. However, the valuation does not specify what percentage of active deaths are considered to be duty-related. In contrast, the percentage assumption for duty disabilities is stated in both reports. The percentage assumption for duty deaths should also be stated.

In general, we conclude the assumptions and methods used in the valuation appear to be reasonable and comply with relevant standards of practice. The recommended assumptions in the experience studies also appear to be reasonable. We recommend the following:

- **Review the inflation assumption and give consideration to whether the assumption should be lowered as recommended in the experience studies**
- **Monitor the investment return assumption and consider lowering the assumption as recommended in the experience studies**
- **Consider updating the mortality assumptions to the most recent Society of Actuaries' mortality table and generational mortality improvement scale as recommended in the experience studies**

- **Consider whether a corridor around the market value of assets should be included in the asset smoothing method**
- **Evaluate the use of an open amortization period when the plans reach the 15-year open funding period (or 10-year as recommended in the experience study) in 2026. Consider adopting a funding policy that targets 100% funding over a reasonable time period. Monitor the payroll growth assumption to ensure that it remains consistent with actual increases in payroll.**
- **Consider refinements to the retirement assumptions as noted above**

4 Peer Group Benchmarking

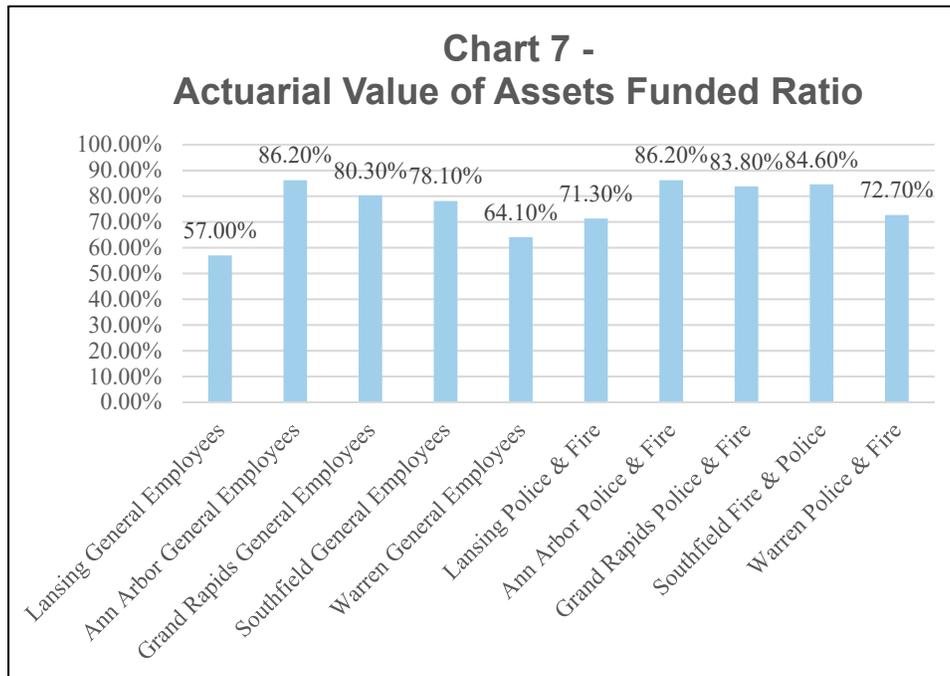
In order to compare the adequacy of plan design, funding methods, benefit provisions, and other features of the City of Lansing Retirement Systems, we have assembled information from other retirement programs, as directed. This peer group consists of seven plans from four cities in Michigan. The seven plans included are:

- City of Ann Arbor — Employees' Retirement System (includes General, Police, and Fire members)
- City of Grand Rapids — General Retirement System
- City of Grand Rapids — Police and Fire Retirement System
- City of Southfield — Employees Retirement System
- City of Southfield — Fire and Police Retirement System
- City of Warren — Employees Retirement System
- City of Warren — Police and Fire Retirement System

The information used in this analysis was drawn from the following reports:

- “City of Ann Arbor Employees' Retirement System June 30, 2015 Actuarial Valuation of Pension Benefits” prepared by Buck Consultants, November 2015
- “City of Grand Rapids General Retirement System 48th Annual Actuarial Valuation Report June 30, 2015 – Revised” prepared by Gabriel Roeder Smith, March 2016
- “City of Grand Rapids Police and Fire Retirement System 49th Annual Actuarial Valuation December 31, 2015” prepared by Gabriel Roeder Smith, April 2016
- “City of Southfield Employees Retirement System Fiftieth Actuarial Valuation Report as of June 30, 2015” prepared by Gabriel Roeder Smith, November 2015
- “City of Southfield Fire and Police Retirement System 63rd Actuarial Valuation Report as of June 30, 2015” prepared by Gabriel Roeder Smith, November 2015
- “City of Warren Employees Retirement System Summary Annual Report December 31, 2014”
- “City of Warren Police and Fire Retirement System Summary Annual Report December 31, 2014”

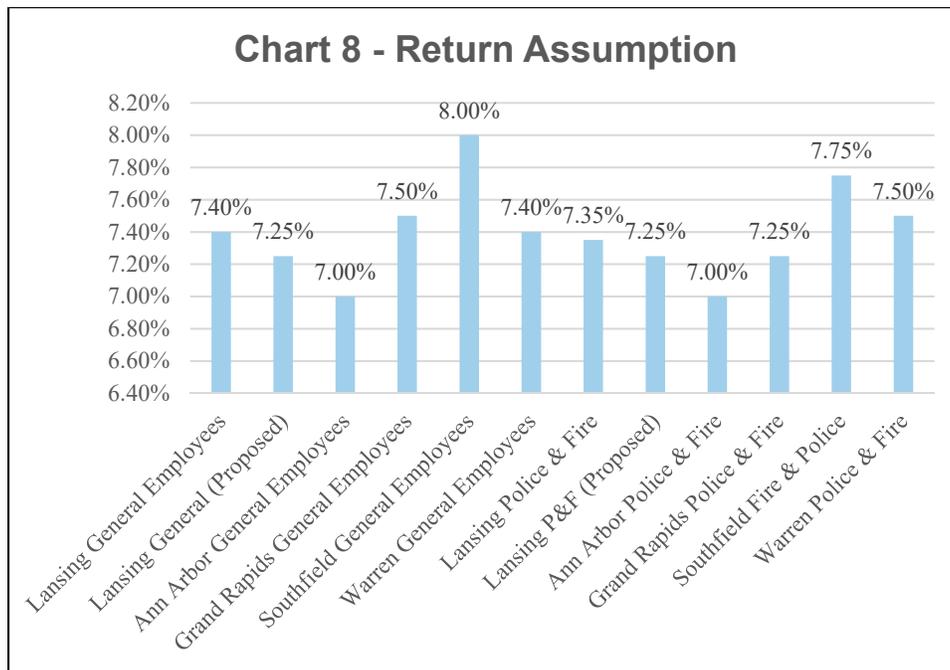
A summary of actuarial assumptions/methods and plan provisions is provided in the tables below.



Lansing’s plans have the lowest funded ratios of the plans in the study for both General Employees and Police & Fire.

Plan	Smoothing Period	Corridor
Lansing General Employees	5 years	None
Ann Arbor General Employees	5 years	None
Grand Rapids General Employees	5 years	None
Southfield General Employees	5 years	None
Warren General Employees	4 years	None
Lansing Police & Fire	5 years	None
Ann Arbor Police & Fire	5 years	None
Grand Rapids Police & Fire	5 years	None
Southfield Fire & Police	6 years	None
Warren Police & Fire	4 years	None

All of the plans use an asset smoothing period of 4-6 years, which is also consistent with industry norms. None of the plans apply a corridor in the calculation of the actuarial value of assets.



The rate of investment return assumptions used by the plans are in the range of 7.00%-8.00%, which is consistent with other state and local pension funds in the industry. The investment return assumption for the Lansing plans is 7.60% and the information in this section is based on that assumption. The Employees' Plan lowered this assumption to 7.40% with the stated intention of lowering the rate to 7.25% next year. The Police and Fire plan lowered this assumption to 7.35% with the stated intention of lowering the rate to 7.25% next year. The decrease in the investment return assumptions will result in a decrease in the funded ratio and an increase in the liabilities and contribution rates.

Table 2 - Amortization of Unfunded Liabilities			
Plan	Amortization Method	Payroll Growth	Amortization Period
Lansing General Employees	Level % of pay	3.10%	Partially Closed – 27 years reduced by one year each year until 15 years, when the period remains at 15
Ann Arbor General Employees	Level % of pay	3.50%	Closed – 25 years
Grand Rapids General Employees	Level dollar	N/A	Closed – 30 years
Southfield General Employees	Level % of pay	3.50%	Closed – 25 years
Warren General Employees	Level % of pay	4.00%	Closed over active working lifetime
Lansing Police & Fire	Level % of pay	3.10%	Partially Closed – 27 years reduced by one year each year until 15 years, when the period remains at 15

Ann Arbor Police & Fire	Level % of pay	3.50%	Closed – 25 years
Grand Rapids Police & Fire	Level % of pay	3.50%	Closed – 30 years
Southfield Fire & Police	Level % of pay	4.00%	Closed – 22 years
Warren Police & Fire	Level % of pay	5.00%	Closed – 25 years

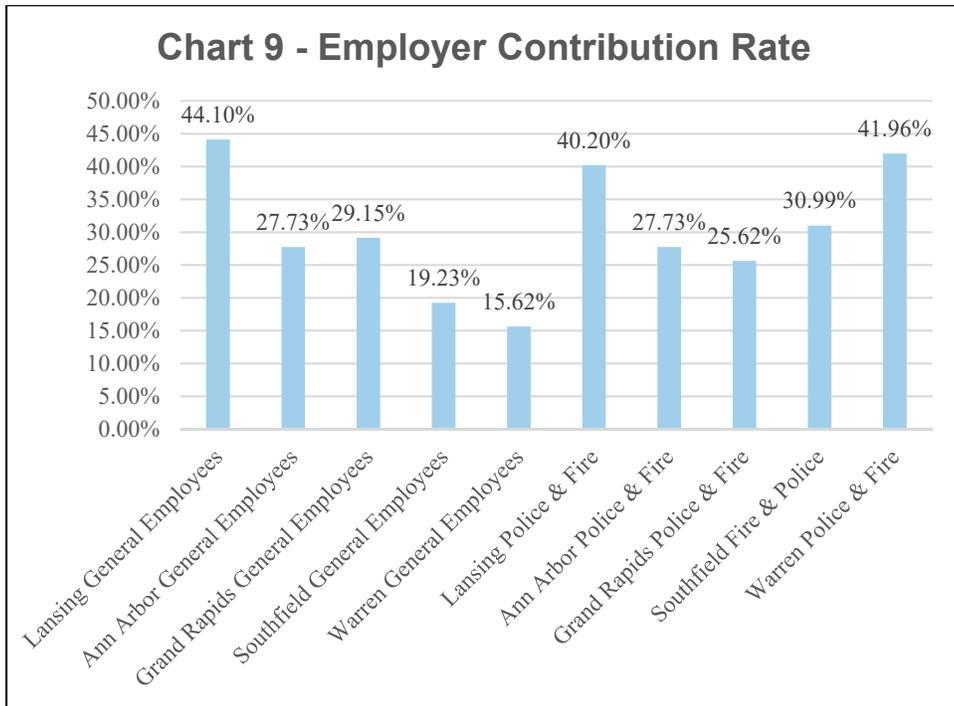
All of the plans use a closed period for the amortization of unfunded liabilities, and all but one (Grand Rapids General) calculate the required contribution as a percent of payroll. Closed periods amortize unfunded liabilities more rapidly than open periods, which may not ever amortize the unfunded liability. Lansing’s plans have the additional mechanism that the funding period will become open when the closed period reaches 15 years.

The payroll growth (inflation) assumption has been reduced from 3.10% to 2.925% for the Employees’ Plan and from 3.10% to 2.85% for the Police and Fire Plan. Lansing has the lowest inflation assumptions, with other cities using rates up to 5.00% per year. Grand Rapids uses a flat-dollar amortization of unfunded liabilities, and hence does not apply an inflation adjustment in the context of financing the unfunded liability.

All employers are currently making contributions in accordance with their funding policies and actuarial valuations.

Table 3 - Employee Contributions	
Plan	Employee Contribution Rate
Lansing General Employees	2.95% - 6.50% by job classification and tier
Ann Arbor General Employees	6.00%
Grand Rapids General Employees	4.22% - 11.54% by benefit election, job classification, and tier
Southfield General Employees	AFSCME 5.41%, all others 5.00%
Warren General Employees	None
Lansing Police & Fire	7.00% - 9.52% by job classification and tier
Ann Arbor Police & Fire	6.00%
Grand Rapids Police & Fire	9.86% - 10.70% by job classification; lower if funded percentage exceeds 100%
Southfield Fire & Police	3.00% or 5.00% based upon group and tier; no contributions for Fire Chief
Warren Police & Fire	3.67%

Employee contributions vary, from no contribution (Warren Employees) to 11.54% of payroll (Grand Rapids Emergency Communication Supervisors).



Lansing employer contribution rates are relatively high within the peer group, representing the highest rate (44.10% of covered payroll) for general employee groups and the second-highest rate (40.20%) for police and fire groups. This is a result of many factors, including the underlying benefits of the plans, the historical funding, and the current asset levels.

Table 4 - Retirement Eligibility		
Plan	Normal Retirement Age	Early Retirement Age
Lansing General Employees	New Plan: Age 50 with 25 years of service or at age 58 with 8 years of service	N/A
Ann Arbor General Employees	Age 50 with 25 years of service, or age 60 with 5 years of service (10 years for Tier 2)	Age 50 with 20 years of service
Grand Rapids General Employees	30 years of service, or age 62 and 8 years of service. Effective January 1, 2001, members covered by the Emergency Communications Operators Bargaining Unit may retire after age 55 and 8 years of service.	20 years of service, or age 55 and 10 years of service
Southfield General Employees	Tier II: Age 57 with 25 years of service, age 62 with 20 years of service, or age 65 with 10 or more years of service	Tier II: Age 57 with 20 or more years of service or age 60 with 10 years of service.
Lansing Police & Fire	Age 55 or 25 years of service, for FOP-NS hired on or after August 1, 2014, age 50 with 25 years of service	N/A
Ann Arbor Police & Fire	25 years of service, or age 55 with 5 years of service (10 years for Tier 2)	Age 50 with 20 years of service
Grand Rapids Police & Fire	Police: age 50 and 10 years of service. Firefighters: age 55 with 10 years of service.	Age 50 and 10 years of service
Southfield Fire & Police	20 years of service regardless of age	N/A
Warren Police & Fire	Unknown	Unknown
Note: Benefit information not available for City of Warren		

Table 5 - Retirement Benefits		
Plan	Final Average Compensation	Benefit Multiplier
Lansing General Employees	Highest annual compensation paid over 2 consecutive years of credited service within the last 10 years	1.25% to 2.8% based upon employee group and tier
Ann Arbor General Employees	Highest 3 consecutive years out of last 10 (last 5 for Tier 2)	2.5%
Grand Rapids General Employees	Highest 3 calendar years, with exceptions by group	1.8% to 2.7% based upon group, tier, and year of accrual
Southfield General Employees	Tier II: Highest 5 consecutive years out of last 10	Tier I: 2.0% (maximum benefit of 70% of FAC)
Lansing Police & Fire	Highest annual compensation paid over 2 consecutive years of credited service	2.5% - 3.2% based on employee group and tier
Ann Arbor Police & Fire	Highest 3 consecutive years out of last 10 (last 5 for Tier 2)	2.75%
Grand Rapids Police & Fire	Highest 3 consecutive years, increased by adjustment factors	2.0% - 2.8% based on employee group and tier
Southfield Fire & Police	Highest 3 or 5 years based upon group and tier	2.5% or 2.8% based upon group
Note: Benefit information not available for City of Warren		

The newest tier for the Lansing plans have a lower multiplier than the other members of the peer group. However, the newest tier of Lansing members also participate in a DC plan. Our analysis is confined to the defined benefit plans of each city.

All of the plans offer traditional defined benefits derived from years of service and final average compensation. Both Lansing plans have the shortest averaging period for final average compensation among the plans in the peer group. Use of a shorter averaging period results in higher average compensation, leading to higher benefits and liabilities.

Table 6 - Early Retirement Reductions	
Plan	Reductions
Lansing General Employees	N/A
Ann Arbor General Employees	.33% per month from the earlier of age 60 or 25 years of service
Grand Rapids General Employees	Actuarially reduced from age 62
Southfield General Employees	.50% per month from age 62 with 20 years of service or age 65 with 10 years of service
Lansing Police & Fire	N/A
Ann Arbor Police & Fire	.33% per month from the earlier of age 55 or 25 years of service
Grand Rapids Police & Fire	Actuarially reduced from age 55
Southfield Fire & Police	N/A
Note: Benefit information not available for City of Warren	

Table 7 - Post-Retirement Increases	
Plan	Increases
Lansing General Employees	Financed by Members' Benefit Fund, subject to limits and reductions
Ann Arbor General Employees	Ad-hoc, funded by financial gains
Grand Rapids General Employees	1.0% subject to 4-7 year delays by group
Southfield General Employees	None
Lansing Police & Fire	\$525 (annual) per year, subject to limits and reductions
Ann Arbor Police & Fire	Ad-hoc, funded by financial gains
Grand Rapids Police & Fire	1.0% or 1.5% subject to 2 or 5 year delays by group
Southfield Fire & Police	Additional benefits provided through Reserve for Inflation Equity
Note: Benefit information not available for City of Warren	

Most of the plans offer some level of post-retirement increases. In some cases, the increases are limited by increases in the CPI or asset reserves that are specifically set aside for these increases.

In general, the plans in the peer group are very similar in design and funding. Lansing's benefit multiplier for new hires is lower than those in the peer group, but the final average salary period is shorter than the other plans and the City also provides benefits in the form of a DC plan for newly hired general employees. The assumptions Lansing uses in the actuarial valuation are similar to the other plans in the peer group. Lansing's plans have lower funded percentages than the other plans in the peer group.

5 Benefit Efficiency & Plan Design Alternatives

Defined Benefit Plans, Defined Contribution Plans, and Hybrid Plans

Governmental employers sponsor retirement plans in order to provide post-retirement income to their employees through pre-retirement contributions. These plans can be divided into three main categories: defined benefit (DB) plans, defined contribution (DC) plans, and hybrid plans. These classifications are defined by the forms of benefits that are provided and by the funding mechanisms used to supply those benefits.

Defined benefit plans are common in the public sector and are often referred to as “traditional” pension plans. Under a DB plan, the pension amount is defined by formula at retirement for each participant. The benefit is commonly based upon factors such as the participant’s age, service, and salary at retirement. The contributions necessary to fund these benefits are adjusted, as needed, to ensure adequate funding of benefits. DB plans typically pay benefits as a monthly annuity for the life of the retiree, often with additional survivor benefits that can be elected upon retirement. Additional options that may be offered in DB plans include active death and disability benefits (“ancillary benefits”), subsidized early retirement benefits, and post-retirement cost-of-living adjustments. From the employer perspective, the amount of benefits that will be paid from the plan will drive the ultimate costs.

Defined contribution plans are common in the private sector, often in the form of a 401(k) plan or in the public sector, in the form of a supplemental 457(b) plan, referring to the sections of the IRS code that govern their administration. Under a DC plan, the contributions into the trust are fixed and the amount of benefits that each participant receives is unknown. At retirement, the benefit is simply the total of contributions allocated to the employee, with interest. DC plans typically pay a lump sum amount at retirement, although some DC plans also offer annuity options. Since the participant’s benefit is defined to be their account balance, disability and death benefits are limited to this amount. Unlike DB plans, DC plans sometimes provide an active employee access to funds through loans or hardship distributions. From the employer perspective, the ultimate cost of the plan is fixed and the individual account balances will determine the amount of benefits that will be paid to individual employees from the plan.

Hybrid plans have a combination of defined benefit and defined contribution attributes. Hybrid plans have gained popularity in the last few decades, and are in effect for state employees in Oregon, Georgia, Utah, Washington, and Nebraska, among others. Examples of hybrid plans include DB/DC offset plans, cash balance plans, combined plans, and variable annuity plans. Hybrid plans can result in reduced cost volatility to the employer, depending upon how they are structured.

In most cases, DC plans are designed to have lower employer costs than DB or hybrid plans. The lower cost structure is a result of the transfer of risks from the employer to the employees. If a DB plan and a DC plan have the same employer cost, the benefits provided from a DC plan are lower than benefits provided from a DB plan. This is because there is a pooling of certain risks (such as longevity) in a DB plan that does not exist in a DC plan.

In a DB plan, primarily the employer assumes the risks, while in a DC plan the risks are borne by the employee. Hybrid plans were developed in part to share these risks between employers and employees.

Defined benefit plans have proven to be an efficient system for delivery of retirement benefits. Typically, defined contribution plans cannot provide the same level of benefits per dollar of cost as defined benefit plans. Some of the main reasons are as follows:

- Defined benefit plans provide significant cost-sharing by spreading mortality risk over a large pool of members. Defined contribution accounts are individually assigned and must be managed so that the retiree does not outlive his or her benefits.
- In practice, individually managed accounts can expect higher administrative costs and lower investment returns than a professionally managed defined benefit plan with a longer time horizon.
- Defined contribution accounts suffer from “leakage” as funds are used for purposes other than retirement.
- In a defined contribution plan, there is a higher cost of converting an account balance to an annuity at market rates or else members must assume the longevity risk of benefits.
- Defined contribution plans cannot provide pre-retirement death benefits or disability benefits at comparable costs and benefit levels as provided under a defined benefit plan.

While more efficient, defined benefit plans do bring a significant level of risk to employers, who are ultimately responsible for making required contributions in most cases. Because of this, many corporations have frozen participation in their defined benefit plans or shut them down entirely. This is often difficult in the public sector due to the contractual nature of the benefits.

Workforce Management

An important issue in employee retirement and benefit plans is the effect that the plans have on employee behavior. As part of a compensation package, employers use retirement plans to help attract and retain qualified employees. This is especially important in the public sector, where potential hires often have an expectation of participating in attractive retirement plans to make up for lower compensation than in the private sector. Due to onerous IRS and accounting rules and the high volatility associated with these measurements, private companies have mostly eliminated their DB plans and moved to DC plans. This has made DB plans (and hybrid plans that offer a meaningful DB benefit) an attractive feature for potential hires found predominantly in the public sector.

In some cases, DC plans may be more attractive to new hires. The portability feature of DC plans allows the participant to take the DC account balance when leaving service. This differs from a DB plan, where benefits payable upon withdrawal before retirement are typically smaller. This portability can make a DC plan a more attractive option to younger employees who may not plan to work with the same organization for an extended period. Recent trends indicate that employees’ tenure with each employer is shorter than it was in the past.

Mid-career employees who are closer to retirement will often prefer the benefits provided by DB plans. Because their working lifetimes are shorter, these employees may not be as attracted to portable benefits. Instead, they may be more likely to find value in the lifetime benefits that DB plans provide.

In general, moving from a DB or hybrid plan to a DC plan will reduce the employer's ability to attract qualified employees to the extent that potential employees find DB plans valuable. This may have less of an effect for younger employees who value the portability of the DC plan benefits.

Because many hybrid plans have DB and DC features, these types of plans can be attractive to both older and younger new hires. Younger hires who plan to withdraw earlier will find the DC portion of the benefit attractive, while older hires who plan to work until retirement age will find the DB portion valuable.

The City of Lansing plans has DB plans. The multipliers for some new member groups have been reduced and are supplemented by participation in a DC plan. These benefits are expected to attract and retain older new hires and certain younger employees, depending on their preference.

The provisions of DB plans may also be used to affect employee behavior after the date of hire. Subsidized benefits like early retirement may encourage employees to retire when certain age or service thresholds are met. For example, a DB plan that offers an unreduced early retirement benefit at age 62 will invariably see a spike in retirements at age 62. To the extent that the employers whose employees participate in the plan desire that their employees leave active service at the age of 62, this would be an effective tool for workforce management. However, if not carefully considered, early retirement benefits can result in unwanted workforce implications. For example, an unreduced retirement benefit at a set level of service (30 years, for example) may have the effect of encouraging the retirement of participants who are at their most valuable to the organization. Participants who were hired at a young age would reach the service threshold in their early 50s, and would then be encouraged by the plan to retire. These employees may still be productive, and the costs of hiring and training new hires to fill these positions may be prohibitive. In short, this feature may have the effect of causing the employer's best employees to leave.

DC plans do not provide subsidized early retirement benefits, as the account balance structure of a DC plan benefit does not allow for these types of benefits. The DC plan structure does not allow for a retirement age that is considered "normal". In fact, if DC participants experience poor returns, they may be required to work well into old age.

DC plans are also unable to influence workforce behavior through special retirement benefits, or "windows". Windows can be structured to target a group of employees to encourage their retirement during a specific period. This may be desirable for employers who would prefer that a group of employees leave active service. Windows will increase the liabilities of the DB plan as they encourage employees to retire sooner than expected and with an increased benefit.

The Lansing Plans provides for a "normal" retirement age and may assist with workforce management. If new employees are moved to a DC plan, it may be more difficult to address workforce management issues through the plan.

Transition

The effect of transition from one plan structure to another must also be considered when contemplating a plan change. Changing benefit structures for participants hired after a certain date will result in new plan “tiers” that will need to be maintained separately from the existing tiers. As a result, there may be an increase in actuarial valuation and administrative costs.

In the case of a transition from a DB plan to a DC plan, the administrative processes would need to be modified to include any new DC plans. Lansing has DC plans in place and therefore would need to amend the current DC plan administration structure to reflect the new provisions.

In addition, the plan change must be clearly communicated to employees. This is especially true if employees are given a choice between two plans. Since the City currently has tiers of employees, the staff has likely dealt with many of these transition issues in the past. This experience would likely reduce the effect of future transitions.

From a cost perspective, closing the DB plan to new members could have significant cost impacts on the current DB plan. If the current plan were closed to new members and the payroll for new DC members is not used in the amortization of the current UAAL, the payroll for the current plan would decline rather than grow during the remaining funding period. As a result, the amortization component would have to be determined as a level percent of declining payroll or as a level dollar amount. This creates a significant increase in the UAAL amortization rates as a percent of payroll.

Lansing’s Plan Liabilities and Impact on Design Alternatives

The following table shows highlights from the December 31, 2015 actuarial valuations:

Table 9 – Summary of Valuation Results (\$ in millions)		
	Employees’ Retirement System	Police and Fire Retirement System
1. Actuarial Accrued Liability		
a) Active Employees	\$ 68.6	\$ 107.0
b) Retirees and Inactive Members	240.2	303.2
c) Total	\$308.8	\$410.2
2. Actuarial Value of Assets	176.0	292.5
3. Unfunded Actuarial Accrued Liability	\$132.8	\$117.7
4. Funded Ratio	57.0%	71.3%
5. City Normal Cost Rate	7.2%	14.2%
6. Active Member Payroll	\$23.9	\$27.9
7. City Contribution Dollars		
a) Normal Cost	\$1.7	\$3.8
b) Payment toward Unfunded	8.5	7.7
c) Total	\$10.2	\$11.5

We observe the following about the Plans' financial condition:

- Any plan changes would only affect active members' future benefits. The normal cost represents the value of benefits accruing for active members. The City normal cost rate is 7.2% of payroll for Employees' and 14.2% of payroll for Police and Fire. The normal cost portion of the City's contribution is \$1.7 million for Employees' and \$3.8 million for Police and Fire for a total of \$5.5 million. Reductions in future benefits would affect the City's contributions of the normal cost of \$5.5 million. As an example, if the value of benefit accruals were reduced across the Board by 10% for active members, the reduction in the City's contribution would be \$550,000.
- The unfunded actuarial accrued liability, which totals \$250 million, represents benefits that have already been earned. These benefits will not be affected by reducing future benefits. As mentioned above, new benefits accrue at the rate of approximately \$5.5 million per year. This unfunded liability will need to be paid by the City over a reasonable amortization period to ensure that promised benefits are secure.
- One of the ways to affect the unfunded actuarial accrued liability is to reduce benefits to retirees. This option is not being considered in this study, as it is our understanding that this type of plan change is not legal in the State of Michigan. It is important to note that reducing these benefits would affect retirees' income on which they depend for living expenses.

The City should consider whether a change in the delivery of retirement benefits for its active members should be modified from the current defined benefit structure given the minor impact a change would have on the contribution requirements. A change to a defined contribution plan would ultimately set the City's contribution at a certain percentage of payroll. However, the unfunded liability of the plans will need to be funded over a reasonable amortization period and the transition period to a 100% defined contribution plan will take many years. The City should consider whether this change in retirement benefit delivery, that will take many years to realize any significant reduction in contribution, is worthwhile. Furthermore, the City should consider whether the shifting of all retirement risks to its employees is appropriate and consistent with its workforce management goals.

Defined Benefit Plan Changes

In addition to changing the structure of benefits, many organizations have taken the approach of enacting changes to their defined benefit plans in order to reduce costs and lower contribution volatility. In many cases, plan changes are made for employees hired after a certain date, creating a new "tier" of benefits. This can slow down the financial effects of these changes, as cost savings are realized only as current employees leave active service and are replaced by new employees over time.

Some of the more common changes made to defined benefit plans are as follows:

- **Contribution increases:** Plan funding levels can be improved by increasing required contributions by employers, employees or both. In some cases, increases have been accompanied with caps on the amount that the employer will pay, with the rest of the actuarially recommended contribution being the responsibility of employees. This helps

to reduce the volatility of employer contributions, but increases the burden on employees. Employee contribution increases are often perceived as a decrease in pay and can affect the ability of plans to retain employees.

- **Benefit changes:** These changes are made to the mechanisms that determine the amount of retirement (for example, lowering the benefit multiplier from 1.80% to 1.25%). These changes are simple and are typically easy to implement. As with any change, a reduction in benefits can be negatively perceived by employees and conflict with workforce management objectives. The City has made similar changes for new hires with a supplemental DC arrangement for some groups.
- **Cost of Living Increases:** Unlike the private sector, many public sector plans have cost-of-living adjustments (“COLAs”) that increase the amount of benefits as retirees age. This helps maintain benefit security, but can be quite expensive. A 1% ongoing COLA on all benefits can result in a 10%-15% increase in liabilities or more. Many plans have lowered costs by reducing COLAs for non-retirees through limiting increases to inflation, tying them to favorable asset returns, or removing them outright. In some cases, COLAs for current retirees have been lowered. In many cases, these changes have legally challenged with mixed results in courts.
- **Eligibility changes:** These changes are made to the eligibility for benefits (for example, raising the minimum retirement age from 55 to 60). While the ultimate benefit is not affected, the number of payments is reduced since younger retirements are not allowed. These can be a source of significant cost savings, but workforce management issues are very important. As an example, raising the retirement age for a plan that covers police and fire employees only makes sense if the underlying organization has a policy for allowing these employees to work past that age.
- **Compensation adjustments:** Another method for reducing liability is by changing the compensation used in determining the benefit (for example, using more years in the average compensation calculation). Other adjustments have been made to reduce the effect of “spiking”, or the deliberate increase in compensation near the end of an employee’s career to increase pension benefits. While anti-spiking provisions can be important tools in promoting plan fairness, their effects on costs are usually limited.

Any changes to the plan must balance cost savings with workforce management as discussed above. The plan’s goals of attracting and retaining productive employees should always be taken into account when a plan change is considered.

6 Funding Approaches

Amortization Methods

The goal of an appropriate funding policy is to fund the benefits payable from the plan over a reasonable time period. For the purposes of generational equity, the amortization period should also be related to the working lifetime of the group being covered. An appropriate funding policy results in a contribution that funds the Normal Cost (*i.e.*, the cost of benefits accruing in the current year) and includes a payment towards the UAAL, which is the amount for which assets are insufficient to cover the benefits that have been earned in the past. Some commonly used methods of amortization are discussed below.

A “closed” amortization period will reduce the UAAL of the plan over a set timeframe, ending at a specific future date. A closed period has the advantage of effectively amortizing the liability in a predictable manner, but can result in volatile contributions, as the remaining period gets smaller.

An “open” amortization period re-amortizes the UAAL of the plan each year over the same period as the previous year. The contributions under an open amortization period are less volatile than with a closed period, but the UAAL is not amortized as quickly as with a closed period and may never be amortized. Depending on the amortization period, the UAAL may increase under an open amortization period. Open amortization periods are commonly used in the public sector.

A “level percent of payroll” amortization expresses the amortization payments over the future payroll of the group. An assumption must be made about the increase in payroll that is expected to occur over the amortization period. While the payments are expected to be level as a percent of pay, the amount of the payments is smaller in the earlier years of the amortization period and larger in the later years. This can result in a “negative amortization”, where the UAAL grows during the first years of the amortization period. Typically, negative amortization occurs until the amortization period reaches about 15 years. The level percent of payroll amortization method generally results in a stable contribution rate. However, if actual payroll increases are less than expected, the payments are lower and future contributions as a percentage of payroll will increase. In addition, combining the level percent of payroll method with an open amortization period will result in the UAAL increasing every year in the future.

A “level dollar” amortization expresses the amortization payments as a fixed dollar amount over the amortization period. A typical example is a home mortgage payment, where a fixed amount is paid each month. This results in greater payments at the beginning of the period than with the level percent of payroll method. While the payments reduce the UAAL more quickly in the early years of the amortization period, the payments do not remain constant as a percent of payroll.

In some cases, retirement systems use a combination of the methods above in their funding policies. A common example is to use a short, closed period for a one-time benefit adjustment or window, while amortizing the remaining UAAL over a longer, open period. Another option is using fixed-length closed periods to amortize changes in the UAAL each year.

The Employees' and Police and Fire plans use a closed funding method with payments based upon a level percent of payroll. Additionally, when the funding period decreases to 15 years remaining, the funding method will then become an open 15-year period. The experience study recommends lowering this open period for the Employees' Plan to 10 years.

The City has many other options to either accelerate payments toward the plans' UAAL. Payments toward the unfunded liabilities of the Plans could be accelerated by the following changes to the valuation assumptions and methods, among others:

- Shortening the amortization periods of the plans (26 years remaining as of December 31, 2015)
- Lowering the payroll growth assumption (2.92%/2.85% per year) – the experience studies recommend lowering this assumption
- Lowering the rate of return assumption (7.40%/7.35% per year) – the experience studies recommend lowering this assumption

Changing the assumptions or amortization period as suggested will result in higher contributions in the short term. However, the accelerated contributions will earn investment returns and will lower future contributions. Ultimately, the City must determine the methods of funding the plans that provides for systematic funding while meeting the risk profile of the City and its stakeholders.

We recommend the City consider whether increasing contributions would be desirable as a mechanism for reducing future contributions.

We recommend that the City evaluate the use of an open amortization period when the plans reach the 15-year open funding period (or 10-year as recommended by the experience study) in 2026. The City should also consider adopting a funding policy that targets 100% funding over a reasonable time period.

7 Challenges, Conclusions and Recommendations

Based upon the analysis performed above, Segal has identified the following challenges, conclusions and recommendations:

Challenges

The City faces the following challenges that make it difficult to achieve a meaningful reduction in the liabilities of and contributions to the plans:

1. The plans combined have 720 active members and 1,632 retirees and beneficiaries. The ratio of member in pay status to active members is 2.3.
2. The total actuarial accrued liability of the plans is \$719 million, of which \$543 million or 76% is attributable to retirees and beneficiaries.
3. The unfunded actuarial accrued liability as of December 31, 2015 is \$250 million. The City contribution as of December 31, 2015 is \$21.8 million, of which \$16.8 million is toward the unfunded liability of \$250 million. The remaining \$5.5 million is to fund the annual pension benefit accrual for active members. If pension benefits were frozen for active members (i.e., active members would accrue no additional benefits) the reduction in annual contributions would be \$5.5 million.
4. Because of the state limitations on property tax revenue growth, from the state Headlee Amendment and Proposal A, the City anticipates its largest revenue source accounting for 31% of General Fund Revenues, to increase only 2%-3% over the next several years and that pre-Recession property tax revenue levels, net of the extra four mills, will not be reached until 2025 to 2028. Further challenging Lansing and Michigan municipalities, municipal revenue sharing by the State of Michigan has been reduced over the past 15 years by more than \$6 million in real dollars annually for the City, and almost \$9 million annually when adjusted for inflation (see Background section on pages 9-12).

Conclusions and Recommendations

1. We conclude the assumptions and methods used in the valuation appear to be reasonable and comply with relevant standards of practice. We recommend the following:
 - Monitor the investment return assumption, particularly given that the inflation assumption is on the high side of reasonableness, as recommended in the experience studies. The fund is moving to lower this assumption in accordance with the recent experience study. Many public plans have lowered the investment return assumption in response to market conditions. Lowering the investment return assumption results in an increase in the actuarial accrued liability.

- Consider updating the mortality assumptions to the most recent Society of Actuaries' mortality and generational mortality improvement scale as recommended in the experience studies. An update to the mortality table would result in an increase in the actuarial accrued liability, in the range of 2% to 4%.
 - Consider whether a corridor around the market value of assets should be included in the asset smoothing method.
 - Evaluate the use of an open amortization period when the plans reach the 15-year open funding period (or 10-year as recommended by the experience study) in 2026. Consider adopting a funding policy that targets 100% funding over a reasonable time period. Monitor the payroll growth assumption to ensure that it remains consistent with actual increases in payroll.
 - Consider refinements to the retirement assumptions as discussed in the report
2. The City should consider whether a change in the delivery of retirement benefits for its active members should be further modified from its current structure keeping in mind its workforce management goals for recruitment and retention.
 3. The City could consider whether a pension obligation bond would be a means to fund the pension plans. There are a number of issues related to pension obligation bonds including that the bonds need to be issued as taxable bonds and there is a risk that there is a major market correction when the bond proceeds are invested. Some municipalities have seen total costs, including bond debt service, increase after a pension obligation bond is issued. Furthermore, the debt service is a fixed cost and must be paid each year regardless of investment returns.
 4. Ideally, the City could consider accelerating its contributions to the pension plan; however, it is recognized that this may not be practical, given the City's much larger unfunded liability for retiree healthcare and significant resource constraints noted on pages 9-12 of the Background section. Measures the City could consider include:
 - Sale of City assets, which would a one-time, non-recurring source.
 - Increase in the City's income tax rates, although it is understood that to do so, changes would need to be made to State of Michigan legislation.
 - Levying a property tax millage, either within its operating millage or by special millage allowed under State of Michigan Public Act 345 of 1937 for police and fire pensions. It is understood from City officials that the City Charter maximum operating property tax levy is 20.0 mills, and the City is currently levying 19.44 mills. It is also understood from City officials that 1.0 mill currently generates approximately \$2.0 million and equates to a \$50 annual increase for a taxpayer owning a house valued at \$100,000.
 - Levying a local sales tax, which would require a change in State of Michigan legislation, as it is understood to currently be prohibited at the municipal level.

5. The City could consider exploring the transfer of public assets or the revenue generated as sources to fund the pension plans. In the private sector, corporations have made in-kind contributions – non-cash assets such as securities and real estate to fund their retirement plans. US Steel contributed 170,000 acres of timberland to meet its pension liabilities. Pan American World Airways transferred the lease for its flagship terminal at New York's Kennedy Airport to its pension funds. The public sector has begun to implement or consider alternative revenue sources. Some strategies are as follows:
- The private sector's practice of transferring assets to pension funds was cited in a New Jersey proposal to fund the state's beleaguered public pension plans with revenues from the state's lottery.
 - In Canada, the Ontario Teachers' Pension Plan owns the licenses to operate both the British and Irish national lotteries. These assets were not in-kind contributions but rather a direct investment aimed at boosting the pension fund's returns.
 - In 2010, the Pittsburgh City Council irrevocably dedicated parking revenues to the city's three employee pension funds for 31 years. The city effectively transferred the value of asset ownership to the pension plan without requiring it to assume the risks of ownership or management responsibilities.
 - The City of Hartford, Connecticut plans to donate a 600-acre public park, which does not produce revenue, as partial payment of the city's annual required contribution to the Municipal Employees Retirement Fund.
 - One of the most profitable in-kind contributions made to a pension fund was the conveyance in 2011 of a toll-road network owned by Australia's Queensland state government to the state's pension fund. Queensland Investment Corporation, the fund's manager, restructured the business, added two additional roads to the toll network and sold the asset three years later at a \$3.8 billion profit for the pension fund.

The City must weigh these recommendations and its options with the costs of doing nothing. As demonstrated on Chart 3 of the Background section, pension contributions have tripled over the past fourteen years and, even with recent collective bargaining changes, are currently projected to increase another six million in the next twelve years. In light of the City's revenue constraints, combined with retiree healthcare obligations, pension funding obligations could have the effect of crowding out available resources for City services, as well as or in combination with, the path of emergency financial management or bankruptcy, as experienced by some other Michigan communities.