# Retirement Plan for DPS Covered Employees of Dallas/Fort Worth International Airport Board

ACTUARIAL VALUATION REPORT

FOR THE YEAR BEGINNING JANUARY 1, 2019

GRS

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May 7, 2019

Board of Directors
Dallas/Fort Worth International
Airport Board
PO Drawer DFW
DFW Airport, TX 75261-9428

Dear Members of the Board,

**Subject: Actuarial Valuation as of January 1, 2019, for the DPS Covered Employees Plan**

We certify that the information contained in this report is accurate and fairly presents the actuarial position of the Retirement Plan for DPS Covered Employees of Dallas/Fort Worth International Airport Board (the Plan) for the plan year commencing January 1, 2019.

Results of this report should not be used for any other purpose without consultation with the undersigned. Valuations are prepared annually as of January 1, the first day of the plan year. This report was prepared at the request of the Airport Board (the Board) and is intended for use by the Board and designated Airport staff and those designated or approved by the Board. This report may be provided to parties, other than those described above, only in its entirety and only with the permission of the Board.

All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion the results presented also comply with the Plan as amended and restated, and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

***Actuarial Valuation***

The primary purposes of the valuation report are to determine the employer's contribution for the upcoming fiscal year, to describe the current financial condition of the Plan, and to analyze changes in the Plan's financial condition. Valuations are prepared annually, as of January 1 of each year, the first day of the plan year.

***Governmental Accounting Standards Board***

The Plan began complying with Governmental Accounting Standards Board Statement No. 67 (GASB No. 67) with the plan year ending December 31, 2014. Due to the significant amount of disclosure information requested under this statement, all GASB related material will be provided in a separate report.

***Financial Objectives and Actuarially Determined Contribution***

The employer contribution is established by the Board. The Board's current intention is to contribute the Plan's normal cost plus the amount necessary to amortize the unfunded actuarial accrued liability (UAAL) over a period of 30 years from January 1, 2005 (determined as a level percent of covered payroll); this contribution amount is $9,814,861 for the fiscal year beginning October 1, 2019. If we divide this by the January 1, 2019 covered payroll, the contribution is equivalent to 30.85% of pay.

***Progress Toward Realization of Financial Objectives***

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) increased from last year. The funded ratio at January 1, 2019, is 78.5%, while it was 77.7% as of January 1, 2018. The majority of this increase is due to the contributions under the Board's Funding Policy. The Airport also contributed an additional contribution in excess of the Board's Funding Policy which further improved the funded status.

***Benefit Provisions***

The actuarial valuation reflects the benefit and contribution provisions set forth in the Plan as of the valuation date. There are no ancillary benefits funded by a source independent of the Plan. There have been no changes in the benefit provisions since the prior valuation. Please see Table 19 of this report for more details.

***Assumptions and Methods***

The actuarial assumptions and methods are set by the Board of Directors, based upon the recommendation of the actuary. The Board adopted the current assumptions and methods in conjunction with the 2015 Experience Study effective with the 2016 valuation. The actuarial assumptions and methods have not changed since the prior year. We believe that the actuarial assumptions used in the measurements for funding purposes are reasonable and appropriate for that purpose, and that the assumptions are internally consistent, reasonable, and, where appropriate, based on the actual experience of the Plan. For a more detailed description of all of the actuarial assumptions, please see Table 18 of this report.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can and almost certainly will differ, as actual experience frequently deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities and calculated contribution amounts. Due to the limited scope of this assignment, GRS did not perform an analysis of the potential range of such possible future differences. The actuarial calculations are intended to provide information for rational decision making.

This valuation is the first valuation performed since Actuarial Standards of Practice (ASOP) No. 51 – "Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions" became effective. Please see the new Section I of this report for further information.

The undersigned are independent actuaries and consultants. Mr. Siblik is an Enrolled Actuary and a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries. Both Mr. Siblik and Mr. Ward are experienced in performing valuations for large public retirement systems. Please see the following pages for additional disclosures required by Actuarial Standards of Practice.

We are available to answer any questions you may have and to provide additional details as may be appropriate.

Sincerely,
Gabriel, Roeder, Smith & Company

Lewis Ward
Consultant

Daniel J. Siblik, ASA, EA, MAAA
Consultant

# Actuarial Standards of Practice Disclosure Statements

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

The funded status alone is not appropriate for assessing the need for or the amount of future contributions and is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

This report should not be relied on for any purpose other than the purpose described above. Determinations of the financial results associated with the benefits described in this report in a manner other than the intended purpose may produce significantly different results.

The valuation was based upon information furnished by the Airport's administrative staff, concerning the Plan's benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries.  We checked for internal and year-to-year consistency, but did not otherwise audit the data.  We are not responsible for the accuracy or completeness of the information provided by the Airport's administrative staff.

The developed findings included in this report consider data and other information through January 1, 2019.

# Table of Contents

# Executive Summary

The unfunded actuarial accrued liability (UAAL) for this plan is $53.3 million as of January 1, 2019 compared to $51.6 million last year. The funded ratio -- the actuarial value of assets divided by the actuarial accrued liability -- is 78.5% compared to 77.7% as of the last valuation.

The primary reasons for the increase in the UAAL are an actuarial loss of approximately $1.4 million on the investment experience and an actuarial loss of $1.5 million on the liability experience, which offset the expected decreases due to the Board's funding policy and additional contributions made in 2018. Even with the increase in the UAAL, the funded status of the plan improved year over year.

| Item | 2019 | 2018 |
|---|---|---|
| Membership | | |
| • Number of | | |
| - Active Members | 376 | 367 |
| - Retirees and Beneficiaries | 192 | 181 |
| - Inactive, Vested | 33 | 34 |
| - Total | 601 | 582 |
| • Payroll | $31.8 million | $30.0 million |
| Member contribution rate | 7.00% | 7.00% |
| Assets | | |
| • Market value | $188.1 million | $184.8 million |
| • Actuarial value | $194.9 million | $179.9 million |
| • Return on market value | -0.1% | 13.0% |
| • Return on actuarial value | 6.3% | 7.7% |
| • Employer contributions | $10.1 million | $8.7 million |
| • External cash flow % | 1.8% | 1.5% |

# Executive Summary

| | | |
|---|---|---|
| **Actuarial Information** | | |
| • Normal cost % ( total employee + employer) | 22.41% | 22.40% |
| • Accrued Liability | $248.2 million | $231.6 million |
| • Unfunded actuarial accrued liability (UAAL) | $53.3 million | $51.6 million |
| • Funded ratio | 78.5% | 77.7% |
| **Change in UAAL** | | |
| • Asset experience gains/(losses) | $ (1,356,794) | $ 960,648 |
| • Liability experience gains/(losses) | (1,534,866) | 4,499 |
| • Assumption changes | - | - |
| • Method changes | - | - |
| • Plan changes | - | - |
| • Additional contributions | 872,068 | - |
| • Administrative expenses different than assumed | (113,541) | (88,903) |
| • Expected decrease/(increase) | 497,077 | 525,565 |
| • Total decrease/(increase) | $ (1,636,056) | $ 1,401,809 |
| **Contribution Information** | | |
| • Actuarially Determined Contribution | $ 9,814,861 | $ 9,182,713 |
| • As Percentage of Covered Payroll | 30.85% | 30.60% |
| **Change in Actuarially Determined Contribution** | | |
| • Asset experience gains/(losses) | (111,123) | N/A |
| • Liability experience gains/(losses) | (125,707) | N/A |
| • Assumption Changes | - | N/A |
| • Method Changes | - | N/A |
| • Plan Changes | - | N/A |
| • Additional contributions | 71,766 | N/A |
| • Administrative expenses different than assumed | (9,299) | N/A |
| • Expected decrease/(increase)* | (457,785) | N/A |
| • Total decrease/(increase) | $ (632,148) | $ (452,136) |

* Nomral cost and amortization payment are expected to grow at the payroll growth rate.
Also includes impact of payroll growing faster/slower than assumed.

# Introduction

The results of the January 1, 2019 actuarial valuation of the Retirement Plan for DPS Covered Employees of Dallas/Fort Worth International Airport Board (the Plan) are presented in this report.

The purpose of any actuarial valuation report is to describe the financial condition of the Plan, to determine the employer's contribution for the upcoming fiscal year, and to analyze changes in the funding requirements.

Section C discusses the determination of the current funding requirements and funding periods. Section D analyzes the changes in (i) the unfunded actuarial accrued liability and (ii) the contribution requirement. This section also discusses the gains and losses resulting from differences between actual experience and the actuarial assumptions.

Sections E through H discuss background information used in the preparation of this report--benefit provisions, actuarial assumptions and methods, financial information, and membership data.

Section I discusses and provides analysis of certain risk measures associated with the measurement of pension plan liabilities and contributions.

All of the tables referenced by the other sections appear in Section J.

# Actuarial Calculations and Funding Status

Table 1 shows the development of the Plan's liabilities and costs.

The Entry Age Normal funding method is used to allocate the actuarial present value of future benefits between the portion due for the current year (the normal cost), prior years (the actuarial accrued liability) and future years (present value of future normal cost). Under this cost method, the current and future normal costs are determined as a level percentage of pay. As of this valuation date, the total normal cost is 22.41% of pay. Since DPS Covered Employees contribute 7% of pay, this means the employer normal cost rate is 15.41% of pay. The actuarial accrued liability is $248.2 million.

The difference between the accrued liability and the actuarial value of assets is the Unfunded Actuarial Accrued Liability (UAAL). The UAAL indicates the value of assets in (excess of)/below the actuarial accrued liabilities. The actuarial value of assets on the valuation date is $194.9 million and therefore the UAAL is $53.3 million.

The Plan’s funded ratio is the ratio of the actuarial value of assets to the actuarial accrued liabilities. This ratio increased from 77.7% at January 1, 2018 to 78.5% at January 1, 2019.

The contribution amount is determined by combining the normal cost with the amortization of the UAAL over the 30-year period ending December 31, 2034 (16 years from this valuation). As noted above, the calculated contribution amount is based on an 16-year amortization of the UAAL. As shown in Table 1, the contribution amount necessary to meet the Board’s funding policy is $9.8 million, an increase from the prior year amount of $9.2 million.

# Analysis of Changes

Table 9 shows the detailed calculation of the asset gain/(loss), while Table 10 shows the development of the liability gain/(loss). (The gains and losses are due to differences between actual experience and anticipated experience determined using the actuarial assumptions.) Table 11 provides a breakout of the liability gain/(loss) by source (e.g. salary loss, retiree mortality loss, etc.).

The unfunded actuarial accrued liability (UAAL) for this plan is $53.3 million as of January 1, 2019 compared to $51.6 million last year. The funded ratio -- the actuarial value of assets divided by the actuarial accrued liability -- is 78.5% compared to 77.7% as of the last valuation. The primary changes in the UAAL during the year were due to the following causes:

- The fund's actuarial return for 2018 was 6.3%, compared to the 7.25% investment return assumption. (This is a smoothed return; the dollar-weighted market return was -0.1%. This may differ from the time-weighted return published by the Board.) This net actuarial loss on the actuarial value of assets increased the UAAL by about $1.3 million.
- There was a liability loss of approximately $1.5 million, primarily due to loss on retiree mortality (fewer deaths than expected) and larger than expected salary increases.
- The UAAL decreased by $0.5 million due to the Board's funding policy and additional $0.9 million due to additional contributions in excess of the Board's funding policy.

The contribution amount needed to meet the Board's stated goal (of paying the normal cost and amortizing the UAAL over a 30-year period beginning January 1, 2005) is $9.8 million, a $0.6 million increase from prior year's amount of $9.2 million. The $9.8 million contribution is 30.85% of the covered payroll as of January 1, 2019.

As shown on the Executive Summary, most of this increase in the contribution was expected and is just a reflection of the increase in payroll from the prior year.

# Benefit Provisions

This valuation reflects benefits promised to members by the Plan. There are no ancillary benefits – retirement-type benefits not required by the Plan but which might be deemed a Plan liability if continued beyond the availability of funding by the current funding source. Please see Table 19 for a summary of the provisions of the Plan used in this valuation.

There were no changes in benefit provisions since the last valuation.

# Actuarial Assumptions and Methods

In determining costs and liabilities, actuaries use assumptions about the future, such as rates of salary increase, probabilities of retirement, termination, death and disability, and an investment return assumption.  The Board adopts the assumptions and methods to be used, taking into account the actuary's recommendations.  This report is based upon the same set of actuarial assumptions and methods used in preparing the prior year's report.

The most significant assumptions are (i) the assumed investment return, set at 7.25%, (ii) the assumption regarding future salary increases, which is a graded rate from 13.25% to 3.75% based on years of service with the Airport and (iii) post-retirement mortality tables which use mortality table RP-2014 with blue collar adjustments and generational mortality improvement using mortality improvement scale BB projected from 2014.

The actuarial assumptions and methods are summarized in Table 18.

In addition to the actuarial assumptions, the actuary also makes use of an actuarial funding method to allocate costs to past, current and future years of service.  The Plan continues to use the Entry Age Normal Method.  Under this method, the actuarial present value of benefits is allocated between the portion due for the current year (the normal cost), prior years (the actuarial accrued liability) and future years (present value of future normal cost).  We believe this method is appropriate for this Plan.

# Fund Assets

Plan assets are held in trust. Asset information used in this valuation has been provided by the Airport's administrative staff. Section I contains several tables which summarize, reconcile or analyze this information.

Table 5 presents a summary of the market value of assets held by the fund. Table 6 shows a reconciliation of the assets from the beginning of the prior year to the valuation date.

Table 7 shows the development of the investment gains and losses for the current year and the development of the Actuarial Value of Assets. Both the actual and expected returns are computed gross of administrative expenses. An actuarial value is used in order to dampen some of the year-to-year fluctuations which would occur if the market value were used instead. The method will recognize 100% of any gains or losses from current year against prior years' deferred gains or losses. Any remaining amount is recognized at 20% per year over five years. Any remaining prior year bases are recognized in equal installments over the remaining period from the date the base was established plus 5 years.

Table 8a shows an estimate of the Plan's yield for the year. This is shown on (i) the market value of assets (reflecting all realized and unrealized gains and losses), and (ii) the actuarial value of assets. While the dollar-weighted market yield this year is approximately -0.1%, the yield on the actuarial value is 6.3%. The difference between these is due to the smoothing of actual market return over/(under) the expected market return of 7.25%.

Table 9 determines the asset gain or loss for the year, based on the difference between the actual fund yield and the assumed rate of 7.25%. The impact of this gain has already been discussed in Section D.

Table 12 shows a history of cash flows to the trust. Table 13 shows a projection of the expected benefit payments from the trust over the next twenty plan years, based on the plan's actuarial assumptions.

# Membership Data

Membership data was provided on computer files sent by the Airport's administrative staff. Data for active members includes sex, birth date, date of hire, salary (for the prior year) and accumulated contributions. Data for inactive, non-retired members was similar, but also includes the members' unreduced benefits. For retired members, data includes status (service retiree, disabled retiree or beneficiary), gender, birth date, pension amount, form of payment, beneficiary sex and birth date if applicable, and date of retirement.

While not verifying the correctness of the data at the source, we performed various tests to ensure the internal consistency of the data and its overall reasonableness.

Membership statistics are summarized in Table 3. Table 4 summarizes certain active member data, and the age/service distribution of active members is shown in Table 14.

Payroll increased by 6.0% since last year. For all comparative purposes, payroll is the annual rate of pay as of the valuation date for covered employees, as supplied by the Airport's administrative staff. Pay is assumed to change only at the end of a plan year.

# Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions

The determination of the accrued liability and an actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and an actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

# Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (continued)

The effects of certain trends in experience can generally be anticipated. For example if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The Funding Policy Employer Contribution amount shown on the Executive Summary may be considered as a minimum contribution amount that complies with the Board's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

**PLAN MATURITY MEASURES**

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Several generally accepted plan maturity measures are described below and are followed by a table showing a 10-year history of these plan maturity measurements for the Plan.

**RATIO OF MARKET VALUE OF ASSETS TO PAYROLL**

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

**RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL**

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions as a percentage of payroll for a fully funded plan. However, since this plan is closed to new members, this ratio by itself will provide very little usefulness because the ratio will grow very large as the payroll decreases. Of more use is the comparison of the trend in the ratio of liability to payroll. A funding policy that targets a funded ratio of 100% is expected to result in these ratios converging over time.

# Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (continued)

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

**RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES**

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

**RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS**

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

**DURATION OF ACTUARIAL ACCRUED LIABILITY**

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return were lowered 1%.

**ADDITIONAL RISK ASSESSMENT**

Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability. While a robust measurement of additional risk assessment is outside the scope of the annual actuarial valuation, we have shown a scenario test of the impact of lower future investment returns on the required contributions later in this section.

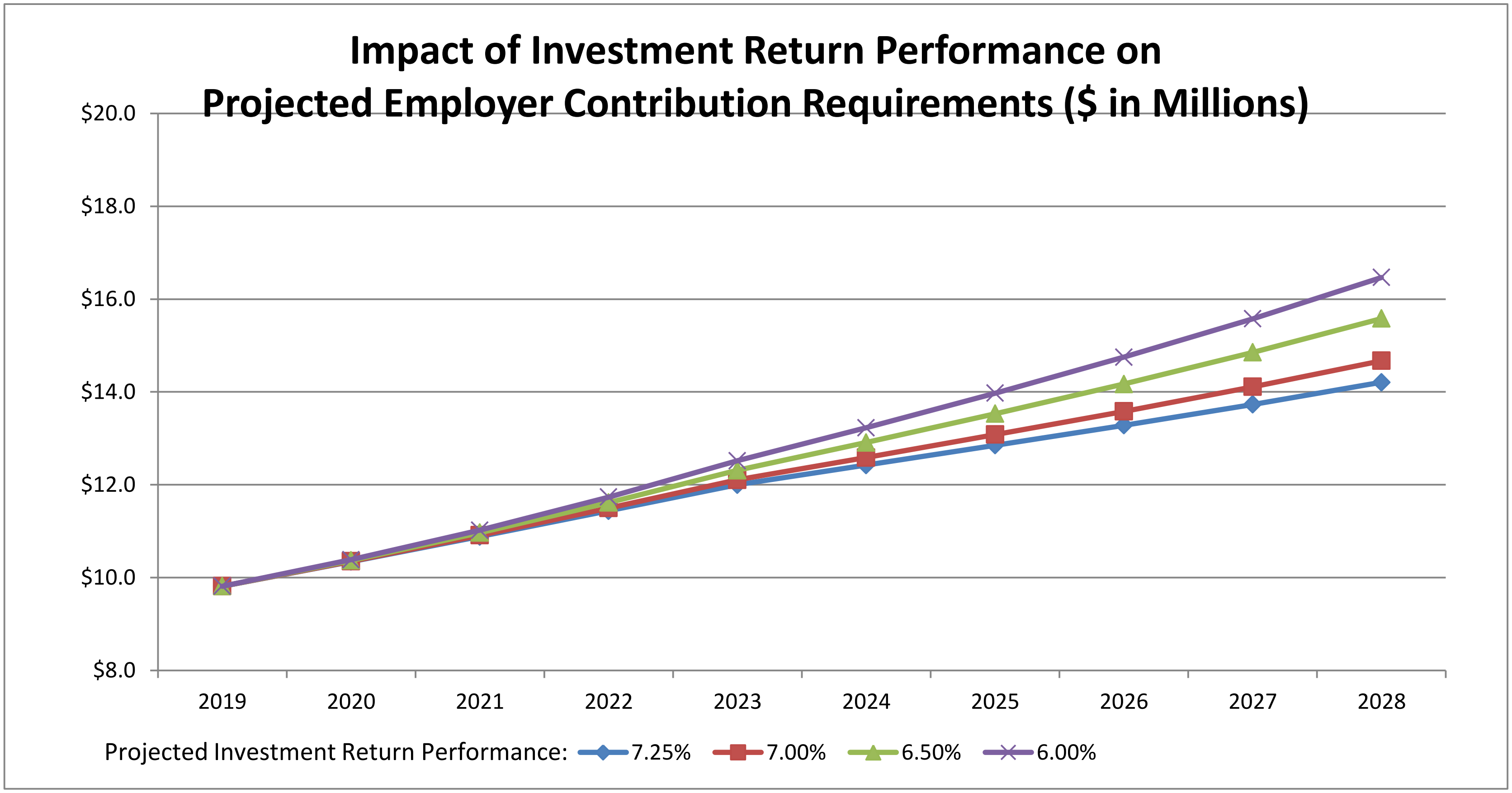
## Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (continued)

| | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ratio of the market value of assets to payroll* | 5.91 | 6.16 | 5.78 | 5.44 | 5.55 | 5.35 | 4.63 | 4.19 | 4.03 | 3.66 |
| Ratio of actuarial accrued liability to payroll* | 7.80 | 7.72 | 7.81 | 7.57 | 7.13 | 6.93 | 6.74 | 6.54 | 6.14 | 5.90 |
| Ratio of actives to retirees and beneficiaries | 1.96 | 2.03 | 2.03 | 2.27 | 2.46 | 2.60 | 2.74 | 2.92 | 3.31 | NA |
| Ratio of net cash flow to market value of assets | 1.8% | 1.5% | 1.8% | 1.6% | 2.6% | 2.4% | 2.4% | 3.1% | 4.6% | 6.6% |
| Duration of the actuarial accrued liability** | 18.31 | NA | NA | NA | NA | NA | NA | NA | NA | NA |

*Payroll is covered payroll of the plan

**Duration measure not available prior to 2019

# Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (continued)



# Tables

## Development of Employer Cost

| | | January 1, 2019<br>(1) | January 1, 2018<br>(2) |
|---|---|---|---|
| 1. | Payroll | $ 31,819,709 | $ 30,005,902 |
| 2. | Present value of future benefits | | |
| | a. Active members | $ 196,818,594 | $ 183,143,962 |
| | b. Retirees and beneficiaries | 122,022,396 | 115,836,600 |
| | c. Deferred vested | 3,271,245 | 3,405,888 |
| | d. Total | $ 322,112,235 | $ 302,386,450 |
| 3. | Total actuarial accrued liability for: | | |
| | a. Active members | $ 122,876,967 | $ 112,322,685 |
| | b. Retirees and beneficiaries | 122,022,396 | 115,836,600 |
| | c. Deferred vested members | 3,271,245 | 3,405,888 |
| | d. Total | $ 248,170,608 | $ 231,565,173 |
| 4. | Actuarial value of assets | $ 194,887,387 | $ 179,918,008 |
| 5. | Unfunded actuarial accrued liability (UAAL) (Item 3d - Item 4) | $ 53,283,221 | $ 51,647,165 |
| 6. | Normal cost rate | | |
| | a. Total | 22.41% | 22.40% |
| | b. Member contribution rate | 7.00% | 7.00% |
| | c. Board normal cost rate | 15.41% | 15.40% |
| 7. | Board Normal Cost (middle of year) | $ 4,903,417 | $ 4,620,909 |
| 8. | Administrative Expense (middle of year) | $ 202,000 | $ 197,000 |
| 9. | Actuarially Determined Contribution | | |
| | a. Board Normal Cost (end of year) | $ 5,078,056 | $ 4,785,486 |
| | b. Administrative Expense (end of year) | 209,194 | $ 204,016 |
| | c. Amortization Payment (end of year) | 4,527,611 | 4,193,211 |
| | d. Total | $ 9,814,861 | $ 9,182,713 |
| 10. | Contribution as percent of covered payroll | 30.85% | 30.60% |

## Schedule of Funding Progress

| Valuation Date | Actuarial Value of Assets (AVA) | Actuarial Accrued Liability (AAL) | Unfunded Actuarial Accrued Liability (UAAL) (3) - (2) | Funded Ratio (2)/(3) | Annual Covered Payroll | UAAL as % of Payroll (4)/(6) |
|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| January 1, 2000 | $ 23,598,802 | $ 34,366,993 | $ 10,768,191 | 68.7% | $ 13,157,024 | 81.8% |
| January 1, 2001 | 28,180,294 | 38,330,640 | 10,150,346 | 73.5% | 13,418,679 | 75.6% |
| January 1, 2002 | 34,083,892 | 46,033,839 | 11,949,947 | 74.0% | 15,817,606 | 75.5% |
| January 1, 2003 | 39,216,132 | 55,333,891 | 16,117,760 | 70.9% | 16,449,424 | 98.0% |
| January 1, 2004 | 44,398,941 | 63,691,774 | 19,292,833 | 69.7% | 15,843,270 | 121.8% |
| January 1, 2005 | 50,945,174 | 89,143,802 | 38,198,628 | 57.1% | 17,875,133 | 213.7% |
| January 1, 2006 [1] | 61,045,216 | 100,053,755 | 39,008,539 | 61.0% | 18,721,786 | 208.4% |
| January 1, 2007 | 69,915,301 | 106,985,517 | 37,070,216 | 65.4% | 19,284,803 | 192.2% |
| January 1, 2008 | 80,482,746 | 116,431,289 | 35,948,543 | 69.1% | 20,129,837 | 178.6% |
| January 1, 2009 | 85,047,550 | 125,563,395 | 40,515,845 | 67.7% | 21,388,133 | 189.4% |
| January 1, 2010 | 90,215,786 | 130,852,905 | 40,637,119 | 68.9% | 22,178,727 | 183.2% |
| January 1, 2011 [1] | 98,340,734 | 146,158,466 | 47,817,732 | 67.3% | 23,785,728 | 201.0% |
| January 1, 2012 | 104,620,612 | 156,221,800 | 51,601,188 | 67.0% | 23,900,023 | 215.9% |
| January 1, 2013 | 111,365,683 | 165,805,345 | 54,439,662 | 67.2% | 24,583,346 | 221.4% |
| January 1, 2014 | 126,911,130 | 175,332,225 | 48,421,095 | 72.4% | 25,291,986 | 191.4% |
| January 1, 2015 | 142,225,564 | 186,832,983 | 44,607,419 | 76.1% | 26,191,975 | 170.3% |
| January 1, 2016 [1] | 152,273,098 | 203,482,590 | 51,209,492 | 74.8% | 26,882,864 | 190.5% |
| January 1, 2017 | 164,361,976 | 217,410,950 | 53,048,974 | 75.6% | 27,839,817 | 190.6% |
| January 1, 2018 | 179,918,008 | 231,565,173 | 51,647,165 | 77.7% | 30,005,902 | 172.1% |
| January 1, 2019 | 194,887,387 | 248,170,608 | 53,283,221 | 78.5% | 31,819,709 | 167.5% |

[1] *Change in actuarial assumptions*

## Membership Data

| | | January 1, 2019<br>(1) | | January 1, 2018<br>(2) |
|---|---|---|---|---|
| 1. Active members | | | | |
| a. Number | | 376 | | 367 |
| b. Total payroll | $ | 31,819,709 | $ | 30,005,902 |
| c. Average salary | $ | 84,627 | $ | 81,760 |
| d. Average age | | 42.7 | | 42.5 |
| e. Average service | | 12.1 | | 11.9 |
| 2. Service retirees | | | | |
| a. Number | | 166 | | 159 |
| b. Total annual benefits | $ | 8,288,859 | $ | 7,860,023 |
| c. Average annual benefit | $ | 49,933 | $ | 49,434 |
| 3. Disabled retirees | | | | |
| a. Number | | 4 | | 4 |
| b. Total annual benefits | $ | 162,507 | $ | 158,080 |
| c. Average annual benefit | $ | 40,627 | $ | 39,520 |
| 4. Beneficiaries | | | | |
| a. Number | | 22 | | 18 |
| b. Total annual benefits | $ | 398,213 | $ | 325,545 |
| c. Average annual benefit | $ | 18,101 | $ | 18,086 |
| 5. Vested deferred members[1] | | | | |
| a. Number | | 33 | | 34 |
| b. Total annual deferred benefits | $ | 531,421 | $ | 566,152 |
| c. Average annual deferred benefit | $ | 16,104 | $ | 16,652 |

[1] *Includes vested terminated and disabled participants on long-term disability and excludes alternate payees of active and vested deferred members who are currently not in payment.*

## Historical Summary of Active Member Data

| Year Beginning January 1, | Active Members | | Covered Payroll | | Average Salary | | Average | Average |
|---|---|---|---|---|---|---|---|---|
| | Number | Percent Increase | Amount in $ Millions | Percent Increase | $ Amount | Percent Increase | Age | Service |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 2000 | 286 | - | 13.3 | - | 46,563 | - | 42.0 | 13.8 |
| 2001 | 278 | (2.8%) | 13.5 | 1.2% | 48,472 | 4.1% | 42.1 | 14.1 |
| 2002 | 287 | 3.2% | 15.8 | 17.4% | 55,114 | 13.7% | 42.2 | 14.2 |
| 2003 | 291 | 1.4% | 16.4 | 4.0% | 56,527 | 2.6% | 42.5 | 14.2 |
| 2004 | 271 | (6.9%) | 15.8 | (3.7%) | 58,462 | 3.4% | 42.4 | 13.8 |
| 2005 | 289 | 6.6% | 17.9 | 12.8% | 61,852 | 5.8% | 42.9 | 14.0 |
| 2006 | 299 | 3.7% | 18.7 | 4.7% | 62,615 | 1.3% | 42.4 | 13.1 |
| 2007 | 305 | 2.0% | 19.3 | 3.0% | 63,229 | 1.0% | 42.0 | 12.3 |
| 2008 | 307 | 0.7% | 20.1 | 4.4% | 65,570 | 3.7% | 42.1 | 12.3 |
| 2009 | 316 | 2.9% | 21.4 | 6.3% | 67,684 | 3.2% | 41.9 | 12.0 |
| 2010 | 328 | 3.8% | 22.2 | 3.7% | 67,618 | (0.1%) | 41.7 | 11.9 |
| 2011 | 351 | 7.0% | 23.8 | 7.2% | 67,766 | 0.2% | 41.7 | 11.7 |
| 2012 | 350 | (0.3%) | 23.9 | 0.5% | 68,286 | 0.8% | 41.9 | 11.8 |
| 2013 | 354 | 1.1% | 24.6 | 2.9% | 69,444 | 1.7% | 41.9 | 11.8 |
| 2014 | 349 | (1.4%) | 25.3 | 2.9% | 72,470 | 4.4% | 42.7 | 12.5 |
| 2015 | 352 | 0.9% | 26.2 | 3.6% | 74,409 | 2.7% | 42.9 | 12.7 |
| 2016 | 348 | (1.1%) | 26.9 | 2.6% | 77,250 | 3.8% | 43.2 | 12.8 |
| 2017 | 350 | 0.6% | 27.8 | 3.6% | 79,542 | 3.0% | 42.8 | 12.3 |
| 2018 | 367 | 4.9% | 30.0 | 7.8% | 81,760 | 2.8% | 42.5 | 11.9 |
| 2019 | 376 | 2.5% | 31.8 | 6.0% | 84,627 | 3.5% | 42.7 | 12.1 |

# Plan Net Assets
# (Assets at Market or Fair Value)

| Item | January 1, 2019 | January 1, 2018 |
|---|---|---|
| (1) | (2) | (3) |
| 1. Cash and Cash Equivalents | $ 7,091,576 | $ 2,723,303 |
| 2. Receivables: | | |
| a. Contributions | $ 0 | $ 0 |
| b. Interest, dividends and due from broker | 204,980 | 248,189 |
| c. Total receivables | $ 204,980 | $ 248,189 |
| 3. Investments | | |
| a. Bonds and Notes | $ 23,666,852 | $ 22,278,774 |
| b. Equities | 40,336,941 | 39,993,429 |
| c. Commingled Funds | 40,662,919 | 17,786,963 |
| d. Mutual Funds | 0 | 24,282,390 |
| e. Limited partnership | 76,780,058 | 77,540,726 |
| f. Total investments | $ 181,446,770 | $ 181,882,282 |
| 4. Total assets | $ 188,743,326 | $ 184,853,774 |
| 5. Liabilities | | |
| a. Administrative fees payable | $ 71,174 | $ 78,488 |
| b. Non-current administrative fees payable | 0 | $ (73,869) |
| c. Securities purchased, etc. | 613,671 | 97,587 |
| d. Other payables | 0 | 0 |
| e. Total liabilities | $ 684,845 | $ 102,206 |
| 6. Adjusted cash | $ 0 | $ 0 |
| 7. Total market value of assets available for benefits (Item 4 - Item 5 + Item 6) | $ 188,058,481 | $ 184,751,568 |
| 8. Asset allocation (investments)* | | |
| a. Bonds and Notes | 13.0% | 12.2% |
| b. Equities | 22.2% | 22.0% |
| c. Commingled Funds | 22.5% | 9.8% |
| d. Mutual Funds | 0.0% | 13.4% |
| e. Limited partnership | 42.3% | 42.6% |
| f. Total investments | 100.0% | 100.0% |

**Reflects allocation of assets in Item 3. Plan also held cash and cash equivalents equal to 3.8% of PY 2018 end of year assets and 1.5% of PY 2017 end of year assets.*

## Reconciliation of Plan Net Assets

| | Year Ending | | | |
|---|---|---|---|---|
| | December 31, 2018 | | December 31, 2017 | |
| | (1) | | (2) | |
| 1. Market value of assets at beginning of year | | | | |
| a. Net assets at beginning of year | $ | 184,751,568 | $ | 160,944,839 |
| b. Adjustment | | 0 | | 0 |
| c. Adjustment for contribution receivable | | 0 | | 0 |
| d Trust value of assets at beginning of year | $ | 184,751,568 | $ | 160,944,839 |
| 2. Additions for the year | | | | |
| a. Employer contributions paid into trust | $ | 10,054,781 | $ | 8,730,577 |
| b. Employee contributions paid into trust | | 2,173,529 | | 2,041,354 |
| c. Income | | | | |
| i. Interest, dividends, and other income | | 2,781,139 | | 2,049,026 |
| ii. Net realized and unrealized gains /(losses) | | (2,424,465) | | 19,480,351 |
| iii. Investment expenses | | (518,171) | | (468,383) |
| iv. Net income | $ | (161,497) | $ | 21,060,994 |
| d. Total additions | $ | 12,066,813 | $ | 31,832,925 |
| 3. Deductions for the year | | | | |
| a. Benefit payments | $ | 8,453,264 | $ | 7,748,350 |
| b. Administrative and miscellaneous expenses | | 306,636 | | 277,846 |
| c. Total deductions | $ | 8,759,900 | $ | 8,026,196 |
| 4. Increase in net assets (Item 2d - Item 3c) | $ | 3,306,913 | $ | 23,806,729 |
| 5. Trust value of assets at end of year (Item 1d + Item 4) | $ | 188,058,481 | $ | 184,751,568 |
| 6. Contributions receiveable at end of year | $ | 0 | $ | 0 |
| 7. Market value of assets at end of year (Item 5 + Item 6) | $ | 188,058,481 | $ | 184,751,568 |

## Development of Actuarial Value of Assets

| | | January 1, 2019 |
|---|---|---|
| 1. | Market value of assets at beginning of year | $ 184,751,568 |
| 2. | Net new investments | |
| | a. Employer Contributions | $ 10,054,781 |
| | b. Employee Contributions | 2,173,529 |
| | c. Benefits and refunds paid | (8,453,264) |
| | d. Administrative and miscellaneous expenses | (306,636) |
| | e. Subtotal | 3,468,410 |
| 3. | Assumed investment return rate for fiscal year | 7.25% |
| 4. | Assumed investment income for fiscal year (reflects timing of contributions) | $ 13,208,196 |
| 5. | Expected Market Value at end of year (1+ 2 + 4) | $ 201,428,174 |
| 6. | Market value of assets at end of year | $ 188,058,481 |
| 7. | Difference (6 - 5) | $ (13,369,693) |

8. Development of amounts to be recognized as of December 31, 2018:

| Fiscal Year End | Remaining Deferrals of Excess (Shortfall) of Investment Income | Offsetting of Gains/(Losses) | Net Deferrals Remaining | Years Remaining | Recognized for this valuation | Remaining after this valuation |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) = (1) + (2) | (4) | (5) = (3) / (4) | (6) = (3) - (5) |
| 2014 | $ 0 | $ 0 | $ 0 | 1 | $ 0 | $ 0 |
| 2015 | 0 | 0 | 0 | 2 | 0 | 0 |
| 2016 | 0 | 0 | 0 | 3 | 0 | 0 |
| 2017 | 4,833,560 | (4,833,560) | 0 | 4 | 0 | 0 |
| 2018 | (13,369,693) | 4,833,560 | (8,536,133) | 5 | (1,707,227) | (6,828,906) |
| Total | $ (8,536,133) | $ 0 | $ (8,536,133) | | $ (1,707,227) | $ (6,828,906) |

| | | |
|---|---|---|
| 9. | Final actuarial value of plan net assets, end of year (Item 6 - Item 8, Column 6) | $ 194,887,387 |
| 10. | Ratio of actuarial value to market value | 103.6% |

Notes: Remaining deferrals in Column (1) for prior years are from last year's report Table 7. The number in the current year is Item 7, above. Column (2) is a direct offset of the current year's excess/(shortfall) return against prior years' excess/(shortfall) of the opposite type.

## Estimation of Yields

| | | | Year Ending December 31, 2018 |
|---|---|---|---|
| A. | Market value yield | | |
| | 1. Beginning market assets | $ | 184,751,568 |
| | 2. Investment income (including realized and unrealized gains and losses) | | |
| | a. Interest and dividends net of investment expenses | $ | 2,262,968 |
| | b. Realized and unrealized gains/(losses) | | (2,424,465) |
| | c. Total investment income based on market value | $ | (161,497) |
| | 3. End of year market assets | $ | 188,058,481 |
| | 4. Estimated dollar weighted market value yield | | (0.1%) |
| B. | Actuarial value yield | | |
| | 1. Beginning of year actuarial assets | $ | 179,918,008 |
| | 2. Actuarial return | $ | 11,500,969 |
| | 3. End of year actuarial assets | $ | 194,887,387 |
| | 4. Estimated actuarial value yield | | 6.3% |

## History of Investment Return Rates

| Plan Year Ending December 31, (1) | Market (2) | Actuarial (3) |
|---|---|---|
| 2000 | 13.9% | 10.8% |
| 2001 | 5.1% | 10.1% |
| 2002 | -9.2% | 5.8% |
| 2003 | 19.1% | 6.8% |
| 2004 | 8.8% | 8.5% |
| 2005 | 3.6% | 5.7% |
| 2006 | 7.8% | 6.2% |
| 2007 | 8.6% | 8.2% |
| 2008 | -23.6% | 1.1% |
| 2009 | 19.4% | 1.3% |
| 2010 | 12.3% | 4.0% |
| 2011 | 1.1% | 3.1% |
| 2012 | 10.4% | 3.7% |
| 2013 | 15.7% | 10.7% |
| 2014 | 4.4% | 8.8% |
| 2015 | -1.1% | 5.3% |
| 2016 | 8.0% | 6.0% |
| 2017 | 13.0% | 7.7% |
| 2018 | -0.1% | 6.3% |
| Five-year Average Return | 4.7% | 6.8% |
| Ten-year Average Return | 8.1% | 5.7% |

## Investment Experience Gain or Loss

| Item<br>(1) | Valuation as of January 1, 2019<br>(2) |
|---|---|
| 1. Actuarial assets, beginning of current year | $ 179,918,008 |
| 2. Contributions (employee + employer) | $ 12,228,310 |
| 3. Benefits and refunds paid with administrative expenses | $ (8,759,900) |
| 4. Assumed net investment income at 7.25% on | |
| a. Beginning of year assets | $ 13,044,056 |
| b. Contributions* | 125,697 |
| c. Benefits and refunds paid with administrative expenses | (311,990) |
| d. Total | $ 12,857,763 |
| 5. Expected actuarial assets, end of current year (Sum of Items 1 through 4) | $ 196,244,181 |
| 6. Actual actuarial assets, end of current year | $ 194,887,387 |
| 7. Asset experience gain/(loss) for year | $ (1,356,794) |

* *Based on actual timing of contributions*

## Total Experience Gain or Loss

| Item (1) | | January 1, 2019 (2) |
|---|---|---|
| **A.** | Calculation of total actuarial gain or loss | |
| 1. | Unfunded actuarial accrued liability (UAAL), previous year | $ 51,647,165 |
| 2. | Amortization Payment on UAAL | (4,193,211) |
| 3. | Additional Contributions for the year | (872,068) |
| 4. | Expected UAAL (reflecting additional contributions)* | 50,278,020 |
| 5. | Actual UAAL | 53,283,221 |
| 6. | Total experience gain/(loss) for the year (Item 4 - Item 5) | $ (3,005,201) |
| **B.** | Source of gains and losses | |
| 7. | Asset gain/(loss) for the year | $ (1,356,794) |
| 8. | Assumption gain/(loss) for the year | 0 |
| 9. | Method Change | 0 |
| 10. | Gain/(loss) due to plan amendment | 0 |
| 11. | Administrative expenses different than assumed | (113,541) |
| 12. | Liability gain/(loss) for the year | (1,534,866) |
| 13. | Total | $ (3,005,201) |

**Sum of Items 1 through 3 plus interest adjustments based on actual timing of contributions*

## Source of Liability Gains and (Losses)

| Item | January 1, 2019 |
|---|---|
| (1) | (2) |
| 1. Salary Increases | $ (338,413) |
| 2. Service Retirement | 177,134 |
| 3. Withdrawal | (82,747) |
| 4. Disability Retirement | (20,479) |
| 5. Active Mortality | (63,051) |
| 6. Retiree Mortality | (540,793) |
| 7. New Entrants | 0 |
| 8. Retiree cost-of-living-adjustment | (59,349) |
| 9. Other (Data) | (607,168) |
| 10. Total Liability Experience Gain/(Loss) | $ (1,534,866) |

*Table 12*

## History of Cash Flow

| Year Ending December 31, (1) | Contributions Received[1] (2) | Benefit Payments (3) | Refunds (4) | Administrative Expenses[2] (5) | Total Outflow (6) | External Cash Flow for the Year[3] (7) | Market Value of Assets (8) | External Cash Flow as Percent of Market Value (9) = (7) / (8) |
|---|---|---|---|---|---|---|---|---|
| 2000 | $ 1,854,636 | $ (93,722) | $ 0 | $ (197,708) | $ (291,430) | $ 1,563,206 | $ 30,002,877 | 5.2% |
| 2001 | 1,274,764 | (363,150) | 0 | (17,653) | (380,803) | 893,961 | 34,502,770 | 2.6% |
| 2002 | 4,513,071 | (331,816) | (3,021) | (42,634) | (377,471) | 4,135,600 | 34,221,371 | 12.1% |
| 2003 | 4,359,477 | (932,709) | 0 | (23,856) | (956,565) | 3,402,912 | 43,366,510 | 7.8% |
| 2004 | 5,396,198 | (1,335,290) | 0 | (38,654) | (1,373,944) | 4,022,254 | 57,650,198 | 7.0% |
| 2005 | 5,759,704 | (1,744,613) | 0 | (67,925) | (1,812,538) | 3,947,166 | 65,349,474 | 6.0% |
| 2006 | 7,071,651 | (2,216,099) | 0 | (54,036) | (2,270,135) | 4,801,516 | 69,163,878 | 6.9% |
| 2007 | 6,577,594 | (2,941,473) | 0 | (66,898) | (3,008,371) | 3,569,223 | 79,958,601 | 4.5% |
| 2008 | 9,694,630 | (3,379,939) | 0 | (56,288) | (3,436,227) | 6,258,403 | 64,328,895 | 9.7% |
| 2009 | 9,319,603 | (3,858,667) | 0 | (64,169) | (3,922,836) | 5,396,767 | 81,226,731 | 6.6% |
| 2010 | 8,533,606 | (4,084,494) | 0 | (83,314) | (4,167,808) | 4,365,798 | 95,906,007 | 4.6% |
| 2011 | 7,614,689 | (4,393,354) | 0 | (105,507) | (4,498,861) | 3,115,828 | 100,232,655 | 3.1% |
| 2012 | 7,931,213 | (5,083,338) | 0 | (156,772) | (5,240,110) | 2,691,103 | 113,703,138 | 2.4% |
| 2013 | 8,988,702 | (5,493,015) | 0 | (198,844) | (5,691,859) | 3,296,843 | 135,322,381 | 2.4% |
| 2014 | 9,820,633 | (5,826,885) | 0 | (191,315) | (6,018,200) | 3,802,433 | 145,347,736 | 2.6% |
| 2015 | 8,926,694 | (6,431,346) | 0 | (183,042) | (6,614,388) | 2,312,306 | 146,297,465 | 1.6% |
| 2016 | 10,181,430 | (7,011,064) | 0 | (282,675) | (7,293,739) | 2,887,691 | 160,944,839 | 1.8% |
| 2017 | 10,771,931 | (7,748,350) | 0 | (277,846) | (8,026,196) | 2,745,735 | 184,751,568 | 1.5% |
| 2018 | 12,228,310 | (8,453,264) | 0 | (306,636) | (8,759,900) | 3,468,410 | 188,058,481 | 1.8% |

[1] *Column (2) includes employee and employer contributions.*
[2] *Includes investment expenses for years pre-2001*
[3] *Column (7) = Column (2) + Column (6).*

## Projection of Estimated Benefit Payments

| Calendar Year | Total Estimated Annual Benefit Payments |
|---|---|
| 2019 | $ 10,068,830 |
| 2020 | 10,904,096 |
| 2021 | 11,626,269 |
| 2022 | 12,481,867 |
| 2023 | 13,114,273 |
| 2024 | 14,057,805 |
| 2025 | 15,176,702 |
| 2026 | 16,245,672 |
| 2027 | 17,145,707 |
| 2028 | 18,147,729 |
| 2029 | 19,151,768 |
| 2030 | 20,445,229 |
| 2031 | 21,699,079 |
| 2032 | 22,909,172 |
| 2033 | 24,421,500 |
| 2034 | 25,721,179 |
| 2035 | 27,123,626 |
| 2036 | 28,790,108 |
| 2037 | 30,019,798 |
| 2038 | 31,659,310 |

# Distribution of Active Members by Age and Service

| | Years of Credited Service | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Attained Age | 0 Count & Avg. Comp. | 1 Count & Avg. Comp. | 2 Count & Avg. Comp. | 3 Count & Avg. Comp. | 4 Count & Avg. Comp. | 5-9 Count & Avg. Comp. | 10-14 Count & Avg. Comp. | 15-19 Count & Avg. Comp. | 20-24 Count & Avg. Comp. | 25-29 Count & Avg. Comp. | 30-34 Count & Avg. Comp. | 35 & Up Count & Avg. Comp. | Total Count & Avg. Comp. |
| Under 25 | 6 | 4 | 1 | - | - | - | - | - | - | - | - | - | 11 |
| | $ 59,186 | $ 62,066 | $ 67,927 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 61,028 |
| 25-29 | 10 | 8 | 8 | 2 | 1 | 1 | - | - | - | - | - | - | 30 |
| | $ 58,607 | $ 62,250 | $ 67,331 | $ 69,814 | $ 71,748 | $ 86,105 | $ - | $ - | $ - | $ - | $ - | $ - | $ 64,007 |
| 30-34 | 1 | 6 | 6 | 2 | 5 | 24 | 4 | - | - | - | - | - | 48 |
| | $ 58,463 | $ 60,938 | $ 68,773 | $ 68,987 | $ 73,146 | $ 83,612 | $ 83,406 | $ - | $ - | $ - | $ - | $ - | $ 76,682 |
| 35-39 | 4 | 5 | 4 | 2 | 2 | 18 | 19 | 1 | - | - | - | - | 55 |
| | $ 60,105 | $ 63,238 | $ 65,484 | $ 71,194 | $ 71,748 | $ 85,401 | $ 88,481 | $ 105,613 | $ - | $ - | $ - | $ - | $ 80,516 |
| 40-44 | 2 | 2 | 1 | 1 | 3 | 12 | 20 | 18 | 5 | - | - | - | 64 |
| | $ 65,965 | $ 68,134 | $ 77,605 | $ 68,987 | $ 72,321 | $ 81,164 | $ 88,267 | $ 96,102 | $ 105,316 | $ - | $ - | $ - | $ 87,929 |
| 45-49 | 1 | 1 | - | 1 | 3 | 10 | 21 | 14 | 12 | 2 | - | - | 65 |
| | $ 58,463 | $ 67,927 | $ - | $ 68,987 | $ 73,851 | $ 82,597 | $ 85,453 | $ 96,366 | $ 97,924 | $ 94,127 | $ - | $ - | $ 88,460 |
| 50-54 | - | 1 | 1 | - | - | 7 | 12 | 10 | 13 | 4 | 1 | - | 49 |
| | $ - | $ 66,338 | $ 40,442 | $ - | $ - | $ 83,096 | $ 87,412 | $ 85,426 | $ 94,680 | $ 91,905 | $ 108,750 | $ - | $ 87,732 |
| 55-59 | - | - | 1 | 2 | - | 1 | 10 | 7 | 4 | 8 | 6 | 1 | 40 |
| | $ - | $ - | $ 67,927 | $ 72,608 | $ - | $ 86,105 | $ 84,511 | $ 89,742 | $ 99,114 | $ 98,483 | $ 119,659 | $ 97,455 | $ 94,307 |
| 60-64 | - | - | - | - | - | 1 | 1 | - | 1 | 1 | 4 | 5 | 13 |
| | $ - | $ - | $ - | $ - | $ - | $ 76,406 | $ 97,455 | $ - | $ 133,760 | $ 80,707 | $ 106,293 | $ 150,297 | $ 120,384 |
| 65 & Over | - | - | - | - | - | - | - | - | - | - | 1 | - | 1 |
| | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 105,613 | $ - | $ 105,613 |
| Total | 24 | 27 | 22 | 10 | 14 | 74 | 87 | 50 | 35 | 15 | 12 | 6 | 376 |
| | $ 59,603 | $ 62,912 | $ 66,687 | $ 70,318 | $ 72,820 | $ 83,434 | $ 86,967 | $ 93,340 | $ 98,935 | $ 94,963 | $ 113,124 | $ 141,490 | $ 84,627 |

## Retiree Benefits by Form of Payment

| | January 1, 2019 | | |
|---|---|---|---|
| Form of Payment | Count | Total Annual Benefit | Average Annual Benefit |
| Joint and 50% Survivor | 32 | $ 1,546,816 | $ 48,338 |
| Joint and 75% Survivor | 11 | 686,745 | 62,431 |
| Joint and 100% Survivor | 63 | 3,278,023 | 52,032 |
| Single Life Annuity | 14 | 684,596 | 48,900 |
| Life with 5 Years Guaranteed | 3 | 103,914 | 34,638 |
| Life with 10 Years Guaranteed | - | - | - |
| Life with 15 Years Guaranteed | 5 | 258,959 | 51,792 |
| Level Income Option | 38 | 1,729,806 | 45,521 |
| Disabled Retirees | 4 | 162,507 | 40,627 |
| Beneficiaries and Others | 22 | 398,213 | 18,101 |
| All forms | 192 | $ 8,849,579 | $ 46,092 |

## Retiree Benefits by Benefit Start Year

| | January 1, 2019 | | |
|---|---|---|---|
| Benefit Start Year | Count | Total Annual Benefit | Average Annual Benefit |
| 2000 | 6 | $ 125,137 | $ 20,856 |
| 2001 | 4 | 164,223 | 41,056 |
| 2002 | 5 | 179,803 | 35,961 |
| 2003 | 23 | 997,282 | 43,360 |
| 2004 | - | - | - |
| 2005 | 11 | 496,002 | 45,091 |
| 2006 | 12 | 493,394 | 41,116 |
| 2007 | 15 | 769,884 | 51,326 |
| 2008 | 11 | 436,728 | 39,703 |
| 2009 | 8 | 361,936 | 45,242 |
| 2010 | 5 | 266,268 | 53,254 |
| 2011 | 9 | 449,711 | 49,968 |
| 2012 | 14 | 710,807 | 50,772 |
| 2013 | 5 | 197,028 | 39,406 |
| 2014 | 10 | 491,779 | 49,178 |
| 2015 | 9 | 500,095 | 55,566 |
| 2016 | 18 | 796,878 | 44,271 |
| 2017 | 13 | 865,845 | 66,603 |
| 2018 | 14 | 546,779 | 39,056 |
| 2019 | - | - | - |
| All years | 192 | $ 8,849,579 | $ 46,092 |

## Summary of Changes in Membership Status

| | Active Members | Vested Deferred Members | Service Retirees | Disabled Retirees | Beneficiaries | Total |
|---|---|---|---|---|---|---|
| Members as of 1/1/2018 | 367 | 34 | 159 | 4 | 18 | 582 |
| Retirements | (5) | (2) | 7 | | | |
| Deaths | | | | | | |
| Disabilities | | | | | | |
| Non-vested terminations | (10) | | | | | (10) |
| Vested terminations | (1) | 1 | | | | |
| Lump sums paid | | | | | | |
| Benefits stopped | | | | | | |
| New hires | 24 | | | | | 24 |
| Rehired employees | 1 | | | | | 1 |
| New alternate payees | | | | | 4 | 4 |
| Adjustments | | | | | | |
| Members as of 1/1/2019 | 376 | 33 | 166 | 4 | 22 | 601 |

# Summary of Actuarial Assumptions and Methods (Revised or Reaffirmed effective January 1, 2016)

The current actuarial assumptions and methods were adopted effective January 1, 2016 by the Airport Board based on recommendations from the actuary following an actuarial experience study. Please see our experience study report dated April 26, 2016 for analysis and our rationale for each assumption.

## *I. Valuation Date*

The valuation date is January 1st of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

## *II. Actuarial Cost Method*

The Entry Age Normal actuarial cost method determines actuarial accrued liabilities to years prior to the valuation. The difference between the accrued liability and assets is the Unfunded Actuarial Accrued Liability (UAAL). The UAAL indicates the value of assets in excess of/(below) actuarial accrued liabilities. The calculated contribution amount is determined by combining the amortization payment on the UAAL over the remainder of the 30-year funding period (as established at January 1, 2005) with the normal cost.

The plan-wide normal cost and actuarial accrued liability are the sum of the calculations for each individual member based on their specific assumptions and benefit provisions.

The Normal Cost and Accrued Actuarial Liability are derived by making certain assumptions as to the rates of interest, mortality, turnover, etc., which are assumed to reflect experience for many years into the future. Since actual experience will differ from the assumptions, the costs determined must be regarded as estimates of the true costs of the Plan. The effects of any actuarial gains or losses are immediately reflected in the UAAL.

## *III. Actuarial Value of Assets*

The actuarial value of assets is equal to the market value of assets less a five-year phase in of the Excess (Shortfall) between expected investment return and actual income. The expected investment return each year is calculated based on the market value of assets with the difference from actual income smoothed in over five years in 20% increments. If the current year's difference is opposite sign of the prior years' deferred Excesses/(Shortfalls), then the prior years' bases (starting with the oldest) are reduced dollar for dollar along with the current year's base. Any remaining bases are then recognized over five years (20% per year) from their initial creation.

In no event is the actuarial value of assets less than 67% nor more than 133% of the market value of assets.

# Summary of Actuarial Assumptions and Methods (Continued)
# (Revised or Reaffirmed effective January 1, 2016)

*IV.* *Actuarial Assumptions*

A. Economic Assumptions

1. Investment return: 7.25% per annum, compounded annually, composed of an assumed inflation rate of 2.75% and a real rate of return of 4.50%, net of investment expenses.

2. Administrative expenses: $187,000 for the January 1, 2016 actuarial valuation. This amount will be assumed to increase by 2.75% for subsequent actuarial valuations. For purposes of the actuarial valuation, certain expenses (e.g., custodial fees) have been classified as administrative expenses that may have been classified differently in plan financial statements.

3. Salary increase rate: A 3.75% wage inflation component, including 2.75% price inflation, plus a service-related component as shown below:

| Service | Step-Rate /Promotional | Total Salary Scale |
|---|---|---|
| 1 | 9.50% | 13.25% |
| 2 | 8.00% | 11.75% |
| 3 | 4.75% | 8.50% |
| 4-6 | 3.75% | 7.50% |
| 7 | 3.00% | 6.75% |
| 8-16 | 0.50% | 4.25% |
| 17 or more | 0.00% | 3.75% |

4. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 3.75% per year. This increase rate has no allowance for future membership growth.

B. Demographic Assumptions

1. Mortality rates - after retirement or termination.

   a. Healthy Annuitants – RP-2014 Combined Healthy Mortality Tables with Blue Collar Adjustments. Generational mortality improvements in accordance with Scale BB from the table’s base year of 2014.

   b. Disabled Annuitants – RP-2014 Combined Healthy Mortality Tables with Blue Collar Adjustments, set forward three years. Generational mortality improvements in accordance with Scale BB from the table’s base year of 2014; minimum 3% rate of mortality at all ages

# Summary of Actuarial Assumptions and Methods (Continued)
# (Revised or Reaffirmed effective January 1, 2016)

2. Mortality rates for active members – RP-2014 Employee Mortality tables. Generational mortality improvements in accordance with Scale BB from the table's base year of 2014.

3. Disability rates – rates are from 2015 Experience Study of the Texas Municipal Retirement System. Sample rates are shown below:

| Age | Expected Disabilities Occurring per 1000 Lives |
|---|---|
| (1) | (2) |
| 25 | 0.025 |
| 30 | 0.099 |
| 35 | 0.259 |
| 40 | 0.494 |
| 45 | 0.804 |
| 50 | 1.188 |
| 55 | 1.647 |
| 60 | 2.180 |
| 65 | 2.787 |

4. Termination Rates – Rates based on the member's service, developed from the 2015 Experience Study. Rates reflect terminations for causes other than death, disability or retirement. Rates are shown below:

| Year of Employment | % of Active Members Separating Within Next Year<br>Male and Female |
|---|---|
| 1 | 8.00% |
| 2 | 7.50 |
| 3-8 | 2.75 |
| 9-24 | 0.75 |
| 25+ | 0.00 |

Termination rates are not applied to a member who is eligible for a retirement benefit (reduced or unreduced).

# Summary of Actuarial Assumptions and Methods (Continued)
# (Revised or Reaffirmed effective January 1, 2016)

5. Retirement rates - Rates based on age, developed from the 2015 Experience Study. Rates are shown below:

| Retirement Ages | Rates of Retiremen Male and Femalet |
|---|---|
| Under 55 | 8% |
| 55-61 | 10 |
| 62-69 | 50 |
| 70 | 100 |

C. Other Assumptions

1. Percent married: For valuation purposes 85% of members are assumed to be married. Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.

2. Age difference: Males are assumed to be three years older than females.

3. Post Retirement Cost of Living: 2.75% Per annum on a compound basis.

4. Decrement timing: Decrements of all types are assumed to occur mid-year.

D. Changes in Assumptions since Prior Valuation

None.

# Summary of Benefit Provisions

1. Effective Date: October 1, 1999. Amended and restated effective January 1, 2008.

2. Plan Year: Twelve-month period ending December 31st.

3. Type of Plan: A qualified governmental defined benefit retirement plan.

4. Eligibility: All employees become eligible upon the later of:

    a. Their latest day of employment; or

    b. August 5, 1986.

5. Employee Contributions: 7%.

6. Earnings: Base salary payable to the employee with respect to services rendered, exclusive of overtime pay, bonuses, commissions, expense allowances, longevity pay and all other extraordinary compensation.

7. Employer Contributions: The Board makes contributions which are actuarially determined to meet the remaining cost of the plan.

8. Service: Employees receive credit for service while a member.

9. Final Average Monthly Compensation: The participant's average monthly rate of compensation for the last 36 calendar months of employment.

10. Normal Retirement

    a. Eligibility: A member may retire with a Normal Retirement benefit on or after the first day of the month coincident with or next following the date on which the participant attains age 62 (and five years of service if hired on or after January 1, 2003)

    b. Monthly Benefit: If hired on or before December 31, 2002, the greater of (i) or (ii):

        (i) 2-1/4% of Final Average Monthly Compensation times Credited Service.

        (ii) 3-1/3% of Final Average Monthly Compensation times Credited Service after age 45

    If hired on or after January 1, 2003, the formula (ii) above does not apply.

    c. In addition to a monthly benefit, retirees receive a refund of employee contributions.

# Summary of Benefit Provisions (Continued)

11. Early Retirement

    a. Eligibility: A member may retire with an Early Retirement benefit on or after the first day of the month coincident with or next following the date on which;

        (i) after reaching age 55 with credit for five years of service.

        (ii) the sum of the participant's age and credited service is at least 80, but no earlier than age 50.

        (iii) Effective as of December 31, 2002, the participants complete 25 years of Benefit Service as a commissioned officer.

    b. Benefit: The Normal Retirement Benefit described above calculated as of the Early Retirement Date multiplied by a reduction factor equal to:

        (i) 100% less 5/12% times the number of full months by which his Early Retirement Date precedes his Normal Retirement Date if the member meets eligibility condition (i) above, or

        (ii) 100% if the member meets eligibility condition 11.a.(ii) or 11.a.(iii) above. Retiring under eligibility condition 11.a.(ii) or 11.a.(iii) cancels refund of employee contributions.

12. Disability Retirement

    a. Eligibility: All members are eligible and they become fully vested once disabled.

    b. Monthly Benefit: The disability benefit is determined using the normal retirement formula with additional service and (last) compensation credited during the period of disability. Benefit payments begin at age 65.

13. Deferred Termination Benefit

    a. All participants who terminate after completing five or more years of Vesting Service or becoming eligible for Normal Retirement are 100% vested.

    b. Monthly Benefit: The amount described in 11(b).

    c. Death Benefit: A member who dies after leaving active service but before retiring is entitled to receive a benefit. The amount is calculated assuming the inactive survived to age 55, elected the 50% joint and survivor annuity and died the next day.

# Summary of Benefit Provisions (Continued)

14. Death Benefit

a. Beneficiary Eligibility: Beneficiaries of participants who die while vested.

b. Beneficiary's Benefit: The greater of (i) or (ii)

(i) The Beneficiary makes an election to receive a benefit equal to either (1) the actuarial equivalent of the participant's accrued benefit payable at the member's Normal Retirement Age (i), plus a return of the member's contributions; or (2) the actuarial equivalent of the participant's accrued benefit payable at the member's Early Retirement Eligibility condition (ii) or (iii).

(ii) The smaller of:

A. If the participant has attained age 45 or attained age 35 and completed five years of Vesting Service, the benefit payable is equal to 30 times the participant's rate of Final Average Monthly Compensation; otherwise, 12 times the participant's rate of Final Average Monthly Compensation.

B. If the participant dies prior to Normal Retirement Date, 100 times the monthly retirement income to which the participant would have been entitled on his Normal Retirement Date if he had remained in service with the employer, with no change in his last regular rate of Compensation, until his Normal Retirement Date and based upon his Anticipated PIA determined at date of death. If the participant dies after his Normal Retirement Date, 100 times the monthly retirement income to which the participant would have been entitled if he had retired on the date of death.

c. Method of Payment: Payment will begin immediately and be paid for the life of the beneficiary. If the beneficiary dies prior to receiving 120 payments, payments will continue to a designated beneficiary until a total of 120 payments have been made.

15. Normal Forms of Payment: A married participant is entitled to a 50% Joint and Survivor annuity as the normal form of payment (no actuarial reduction). In the event the participant has a surviving spouse on the date of his death to whom he had been married throughout the one-year period immediately preceding the date of his death, such spouse shall receive 50% of the monthly amount that the participant was receiving prior to his death. An unmarried participant is entitled to a benefit payable for life.

Actuarial equivalence is based on an 8% interest assumption and the "1994 GAR" Mortality Table.

# Summary of Benefit Provisions (Continued)

16. Cost-of-living Increase: Retired members and beneficiaries (except for beneficiaries receiving payments under 13.c. above) receiving benefits receive an automatic adjustment in their benefit each January. Effective January 1, 2004, this adjustment will be made in the same time and manner as it is done for Social Security Benefits. The maximum increase granted in any year is 3.0%.

17. Changes in Major Plan Provisions:

    a. October 1, 1999 – DPS Covered Employees are spun-off into their own separate plan.

    b. October 1, 1999 – Early Retirement Age for DPS Covered Employees is modified to provide an unreduced benefit upon attainment of the Rule of 80 (age and years of service is greater than or equal to 80).

    c. October 1, 1999 – DPS Covered Employees begin contributing 7% of their base compensation to the retirement plan on a pre-tax basis.

    d. December 31, 2002 – Final Average Monthly Compensation changed from high 60 consecutive months out of the last 120 months to the final 36 months.

    e. December 31, 2002 – Addition of Level Income optional form of payment.

    f. December 31, 2002 – For anyone hired after December 31, 2002, 100% vesting at age 62 is eliminated. Initial vesting date occurs after completion of five years of service.

    g. December 31, 2002 – Early Retirement Age for DPS Covered Employees is modified to provide and unreduced benefit at any age upon attainment of twenty-five years of service.

    h. January 1, 2003 – Elimination of 3-1/3% formula for anyone hired on or after January 1, 2003.

    i. January 1, 2003 – Provision of an Enhanced Retirement Benefit for an eligible employee who elects to separate from service between February 28, 2003 and June 30, 2003. The Enhanced Retirement Benefit is elected by the member and is equal to either (i) 3 months of salary or (ii) the member's pension calculate using the member's total compensation in their final average compensation calculation instead of the member's base compensation.

    j. December 31, 2003 – Provide for Cost of Living Adjustments (COLA) for beneficiaries of members who died while in active service for the Airport.

    k. January 1, 2004 – Changed determination of COLA percentage increase to coincide with the determination of the COLA paid to Social Security beneficiaries, except that the annual COLA increase is limited to a maximum of 3%.

l. October 1, 2004 – For employees terminating on or after October 1, 2004 the portion of the benefit formula which reflected a partial offset of the Anticipated Primary Insurance Amount (Social Security Offset) was eliminated.