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Galveston County

Texas County & District Retirement System

GASB 68 Report

For Measurement Date: December 31, 2015

Based on Actuarial Valuation Date: December 31, 2015

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## Certification

Actuarial computations presented in this report under Statement No. 68 of the Governmental Accounting Standards Board are for purposes of assisting the plan sponsor in fulfilling their financial accounting requirements. No attempt is being made to offer any accounting opinion or advice. This report is for employers whose fiscal year end is between January 31, 2016 and December 31, 2016. The reporting date for determining plan assets and obligations is December 31, 2015. The calculations enclosed in this report have been made on a basis consistent with our understanding of the plan provisions. Determinations for purposes other than meeting financial reporting requirements may be significantly different than the results contained in this report. Accordingly, additional determinations may be needed for other purposes, such as judging benefit security or meeting employer funding requirements.

In preparing this report, we relied, without audit, on information as of December 31, 2015 furnished by the Texas County & District Retirement System (TCDRS). This information includes, but is not limited to, statutory provisions (as of January 1, 2016), member census data, and financial information.

We performed a limited review of the census and financial information used directly in our analysis and have found them to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete, our results may be different and our calculations may need to be revised.

This report is only an estimate of the Plan's financial condition as of a single date. It can neither predict the Plan's future condition nor guarantee future financial soundness. All costs, liabilities, rates of interest, and other factors for the Plan have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the Plan and reasonable expectations); and which in combination, offer a reasonable estimate of anticipated experience affecting the Plan.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as, but not limited to, 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. Due to the limited scope of the actuarial assignment, we did not perform an analysis of the potential range of such future measurements.

Milliman's work is prepared solely for the internal business use of TCDRS. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to the participating employers or any other third party recipient of its work product. Milliman does not authorize the inclusion of Milliman's name or reports in any offering, memorandum, prospectus, securities filing, or solicitation of investment. Any third party recipient should engage qualified professionals for advice appropriate to its own specific needs. The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and has been prepared in accordance with generally recognized accepted actuarial principles and practices. Specifically, our calculation of the Net Pension Liability (including the assumptions used) was performed in compliance with the relevant Actuarial Standards of Practice. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.



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## Overview of GASB 67 and GASB 68

In 2012, the Governmental Accounting Standards Board (GASB) released new reporting standards for public pension plans and participating employers. These standards, GASB Statements 67 and 68, substantially changed the reporting requirements previously mandated under GASB Statements 25 and 27. The most notable change is the distinct separation of funding from financial reporting.

GASB 67 applies to financial reporting for the Texas County & District Retirement System (TCDRS) and does not impact participating employers.

GASB 68, which governs the specifics of reporting public pension plan obligations for employers, is required to be implemented for TCDRS employer fiscal years ending June 15, 2015 or later.

Three key ways that GASB 68 affects employer financial statements are:

- 1) GASB 68 requires a liability for pension obligations, known as the Net Pension Liability, to be recognized on the balance sheets of participating employers.
- 2) Changes in the Net Pension Liability from year-to-year will be recognized as Pension Expense on the income statement or reported as deferred inflows/outflows of resources, depending on the type of change.
- 3) Deferred inflows/outflows of resources will need to be reported. These are amounts that are not entirely recognized when they occur. They are recognized over a period of time.

Please refer to the Glossary shown in Appendix F of this report for more information on the relevant accounting terminology.

Note that the previously defined GASB Annual Required Contribution (ARC) has been eliminated under Statements 67 and 68 and is no longer relevant for financial reporting purposes. As a result, plan sponsors have been encouraged to establish a formal funding policy that is separate from financial reporting calculations. A copy of the TCDRS funding policy is shown in Appendix E of this report.

## Net Pension Liability / (Asset)

Net Pension Liability / (Asset)	December 31, 2014	December 31, 2015
Total pension liability	\$350,982,921	\$366,003,920
Fiduciary net position	343,392,910	334,430,902
Net pension liability / (asset)	7,590,011	31,573,018
Fiduciary net position as a % of total pension liability	97.84%	91.37%
Pensionable covered payroll <sup>(1)</sup>	\$57,112,219	\$58,080,901
Net pension liability as a % of covered payroll	13.29%	54.36%

The total pension liability was determined by an actuarial valuation as of the valuation date, calculated based on the discount rate and actuarial assumptions below.

*Note: Rounding differences may exist above or in other tables in this report.*

<sup>(1)</sup> Payroll is calculated based on contributions as reported to TCDRS.

### Discount Rate

Discount rate <sup>(2)</sup>	8.10%	8.10%
Long-term expected rate of return, net of investment expense <sup>(2)</sup>	8.10%	8.10%
Municipal bond rate <sup>(3)</sup>	Does not apply	Does not apply

<sup>(2)</sup> This rate reflects the long-term rate of return funding valuation assumption of 8.00%, plus 0.10% adjustment to be gross of administrative expenses as required by GASB 68.

<sup>(3)</sup> The plan's fiduciary net position is projected to be available to make all projected future benefit payments of current active, inactive, and retired members. Therefore, the discount rate for calculating the total pension liability is equal to the long-term expected rate of return, and the municipal bond rate does not apply. See page 6 of this report for further details.

### Other Key Actuarial Assumptions

Updated mortality assumptions were adopted in 2015. All other actuarial assumptions that determined the total pension liability as of December 31, 2015 were based on the results of an actuarial experience study for the period January 1, 2009 - December 31, 2012, except where required to be different by GASB 68.

See Appendix B of this report (Actuarial Methods and Assumptions Used for GASB Calculations) for a listing of key assumptions used in the calculation of the total pension liability and other GASB 68 metrics.

See Appendix C (Actuarial Methods and Assumptions Used for Funding Valuation) of this report for a full description of the actuarial assumptions used in the funding valuation.

	Beginning Date	Ending Date
Valuation date	Dec. 31, 2014	Dec. 31, 2015
Measurement date	Dec. 31, 2014	Dec. 31, 2015
Employer's fiscal year	October 1, 2015	September 30, 2016

## Long-Term Expected Rate of Return

The long-term expected rate of return on TCDRS assets is determined by adding expected inflation to expected long-term real returns, and reflecting expected volatility and correlation. The capital market assumptions and information shown below are provided by TCDRS' investment consultant, Cliffwater LLC. The numbers shown are based on January 2016 information for a 7-10 year time horizon.

Note that the valuation assumption for long-term expected return is re-assessed at a minimum of every four years, and is set based on a 30-year time horizon; the most recent analysis was performed in 2013. See Milliman's TCDRS Investigation of Experience report for the period January 1, 2009 – December 31, 2012 for more details.

Asset Class	Benchmark	Target Allocation <sup>(1)</sup>	Geometric Real Rate of Return (Expected Minus Inflation) <sup>(2)</sup>
US Equities	Dow Jones U.S. Total Stock Market Index	14.50%	5.45%
Private Equity	Cambridge Associates Global Private Equity & Venture Capital Index <sup>(3)</sup>	14.00%	8.45%
Global Equities	MSCI World (net) Index	1.50%	5.75%
International Equities - Developed	MSCI World Ex USA (net)	10.00%	5.45%
International Equities - Emerging	MSCI World Ex USA (net)	8.00%	6.45%
Investment-Grade Bonds	Barclays Capital Aggregate Bond Index	3.00%	1.00%
High-Yield Bonds	Citigroup High-Yield Cash-Pay Capped Index	3.00%	5.10%
Opportunistic Credit	Citigroup High-Yield Cash-Pay Capped Index	2.00%	5.09%
Direct Lending	Citigroup High-Yield Cash-Pay Capped Index	5.00%	6.40%
Distressed Debt	Citigroup High-Yield Cash-Pay Capped Index	3.00%	8.10%
REIT Equities	67% FTSE NAREIT Equity REITs Index + 33% FRSE EPRA/NAREIT Global Real Estate Index	3.00%	4.00%
Master Limited Partnerships (MLPs)	Alerian MLP Index	3.00%	6.80%
Private Real Estate Partnerships	Cambridge Associates Real Estate Index <sup>(4)</sup>	5.00%	6.90%
Hedge Funds	Hedge Fund Research, Inc. (HFRI) Fund of Funds Composite Index	25.00%	5.25%

<sup>(1)</sup> Target asset allocation adopted at the April 2016 TCDRS Board meeting.

<sup>(2)</sup> Geometric real rates of return in addition to assumed inflation of 1.6%, per Cliffwater's 2016 capital market assumptions.

<sup>(3)</sup> Includes vintage years 2006-present of Quarter Pooled Horizon IRRs.

<sup>(4)</sup> Includes vintage years 2007-present of Quarter Pooled Horizon IRRs.

## Depletion of Plan Assets / GASB Discount Rate

The discount rate is the single rate of return that, when applied to all projected benefit payments results in an actuarial present value of projected benefit payments equal to the total of the following:

1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension plan's fiduciary net position is projected to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term rate of return, calculated using the long-term expected rate of return on pension plan investments.
2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.

Therefore, if plan investments in a given future year are greater than projected benefit payments in that year and are invested such that they are expected to earn the long-term rate of return, the discount rate applied to projected benefit payments in that year should be the long-term expected rate of return on plan investments. If future years exist where this is not the case, then an index rate reflecting the yield on a 20-year, tax-exempt municipal bond should be used to discount the projected benefit payments for those years.

The determination of a future date when plan investments are not sufficient to pay projected benefit payments is often referred to as a depletion date projection. A depletion date projection compares projections of the pension plan's fiduciary net position to projected benefit payments and aims to determine a future date, if one exists, when the fiduciary net position is projected to be less than projected benefit payments. If an evaluation of the sufficiency of the projected fiduciary net position compared to projected benefit payments can be made with sufficient reliability without performing a depletion date projection, alternative methods to determine sufficiency may be applied.

In order to determine the discount rate to be used by the employer we have used an alternative method to determine the sufficiency of the fiduciary net position in all future years. Our alternative method reflects the funding requirements under the employer's funding policy and the legal requirements under the TCDRS Act.

1. TCDRS has a funding policy where the Unfunded Actuarial Accrued Liability (UAAL) shall be amortized as a level percent of pay over 20-year closed layered periods.
2. Under the TCDRS Act, the employer is legally required to make the contribution specified in the funding policy.
3. The employer's assets are projected to exceed its accrued liabilities in 20 years or less. When this point is reached, the employer is still required to contribute at least the normal cost.
4. Any increased cost due to the adoption of a COLA is required to be funded over a period of 15 years, if applicable.

Based on the above, the projected fiduciary net position is determined to be sufficient compared to projected benefit payments. Based on the expected level of cash flows and investment returns to the system, the fiduciary net position as a percentage of total pension liability is projected to increase from its current level in future years.

Since the projected fiduciary net position is projected to be sufficient to pay projected benefit payments in all future years, the discount rate for purposes of calculating the total pension liability and net pension liability of the employer is equal to the long-term assumed rate of return on investments. This long-term assumed rate of



return should be net of investment expenses, but gross of administrative expenses for GASB 68 purposes. Therefore, we have used a discount rate of 8.10%. This rate reflects the long-term assumed rate of return on assets for funding purposes of 8.00%, net of all expenses, increased by 0.10% to be gross of administrative expenses.

As additional documentation for auditing purposes, we have shown the projection of the Fiduciary Net Position in the following exhibit ("Projection of Fiduciary Net Position").

## Projection of Fiduciary Net Position\*

Calendar Year Ending**	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses*** (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Net Position (a)+(b)-(c)-(d)+(e)
2016	\$334,430,902	\$10,576,015	\$20,533,196	\$334,431	\$26,680,208	\$350,819,498
2017	350,819,498	10,439,702	19,302,881	350,819	28,050,478	369,655,977
2018	369,655,977	10,530,683	20,230,103	369,656	29,542,276	389,129,176
2019	389,129,176	10,787,247	21,383,314	389,129	31,083,225	409,227,205
2020	409,227,205	11,143,739	22,420,517	409,227	32,683,335	430,224,534
2021	430,224,534	11,429,094	23,518,064	430,225	34,351,031	452,056,371
2022	452,056,371	11,385,144	24,841,938	452,056	36,064,225	474,211,744
2023	474,211,744	11,356,163	26,182,052	474,212	37,803,561	496,715,206
2024	496,715,206	11,334,349	27,718,450	496,715	39,563,569	519,397,958
2025	519,397,958	11,315,230	29,139,593	519,398	41,342,776	542,396,973
⋮						
2035	742,127,305	6,688,327	43,311,690	742,127	58,628,472	763,390,286
⋮						
2045	978,756,082	5,697,551	52,278,975	978,756	77,390,557	1,008,586,458
⋮						
2055	1,420,200,149	6,505,694	47,892,099	1,420,200	113,336,298	1,490,729,842
⋮						
2065	2,539,319,162	8,871,268	32,308,905	2,539,319	204,653,268	2,717,995,474
⋮						
2075	5,244,794,886	12,499,825	16,064,775	5,244,795	424,478,538	5,660,463,678
⋮						
2085	11,366,619,474	17,632,237	4,889,635	11,366,619	920,750,820	12,288,746,277
⋮						
2095	24,793,391,435	24,872,012	671,858	24,793,391	2,008,241,148	26,801,039,345

\* Projection values include no assumption for future cost-of-living adjustments.

\*\* Note that only select years have been shown for formatting purposes

\*\*\* Administrative expenses are assumed to be 0.10% of Fiduciary Net Position.

## Changes in Net Pension Liability / (Asset)

Changes in Net Pension Liability / (Asset)	Total Pension Liability (a)	Fiduciary Net Position (b)	Net Pension Liability / (Asset) (a) – (b)
Balances as of December 31, 2014	\$350,982,921	\$343,392,910	\$7,590,011
Changes for the year:			
Service cost	8,033,265		8,033,265
Interest on total pension liability <sup>(1)</sup>	28,029,903		28,029,903
Effect of plan changes <sup>(2)</sup>	(1,570,636)		(1,570,636)
Effect of economic/demographic gains or losses	(2,943,467)		(2,943,467)
Effect of assumptions changes or inputs	3,176,506		3,176,506
Refund of contributions	(923,957)	(923,957)	0
Benefit payments	(18,780,614)	(18,780,614)	0
Administrative expenses		(243,373)	243,373
Member contributions		4,072,510	(4,072,510)
Net investment income		414,224	(414,224)
Employer contributions		6,534,101	(6,534,101)
Other <sup>(3)</sup>	0	(34,899)	34,899
Balances as of December 31, 2015	\$366,003,920	\$334,430,902	\$31,573,018

<sup>(1)</sup> Reflects the change in the liability due to the time value of money. TCDRS does not charge fees or interest.

<sup>(2)</sup> Reflects new annuity purchase rates applicable to all TCDRS employers effective January 1, 2018.

<sup>(3)</sup> Relates to allocation of system-wide items.

### Sensitivity Analysis

The following presents the net pension liability of the county/district, calculated using the discount rate of 8.10%, as well as what the Galveston County net pension liability would be if it were calculated using a discount rate that is 1 percentage point lower (7.10%) or 1 percentage point higher (9.10%) than the current rate.

	1% Decrease 7.10%	Current Discount Rate 8.10%	1% Increase 9.10%
Total pension liability	\$411,199,366	\$366,003,920	\$328,345,754
Fiduciary net position	334,430,902	334,430,902	334,430,902
Net pension liability / (asset)	\$76,768,465	\$31,573,018	(\$6,085,148)

## Pension Expense / (Income)

Pension Expense / (Income)	January 1, 2015 to December 31, 2015
Service cost	\$8,033,265
Interest on total pension liability <sup>(1)</sup>	28,029,903
Effect of plan changes	(1,570,636)
Administrative expenses	243,373
Member contributions	(4,072,510)
Expected investment return net of investment expenses	(27,685,855)
Recognition of deferred inflows/outflows of resources	
Recognition of economic/demographic gains or losses	(634,210)
Recognition of assumption changes or inputs	635,301
Recognition of investment gains or losses	6,286,547
Other <sup>(2)</sup>	34,899
Pension expense / (income)	\$9,300,077

<sup>(1)</sup> Reflects the change in the liability due to the time value of money. TCDRS does not charge fees or interest.

<sup>(2)</sup> Relates to allocation of system-wide items.

As of December 31, 2015, the deferred inflows and outflows of resources are as follows:

Deferred Inflows / Outflows of Resources	Deferred Inflows of Resources	Deferred Outflows of Resources
Differences between expected and actual experience	\$2,491,322	\$0
Changes of assumptions	0	2,541,204
Net difference between projected and actual earnings	0	24,313,966
Contributions made subsequent to measurement date <sup>(3)</sup>	N/A	Employer determined

Amounts currently reported as deferred outflows of resources and deferred inflows of resources related to pensions, excluding contributions made subsequent to the measurement date, will be recognized in pension expense as follows:

Year ended December 31:	
2016	\$6,287,638
2017	6,287,638
2018	6,287,638
2019	5,500,934
2020	0
Thereafter <sup>(4)</sup>	0

<sup>(3)</sup> Any eligible employer contributions made subsequent to the measurement date through the employer's fiscal year end should be reflected as outlined in Appendix D of this report.

<sup>(4)</sup> Total remaining balance to be recognized in future years, if any. Note that additional future deferred inflows and outflows of resources may impact these numbers.

## Schedule of Deferred Inflows and Outflows of Resources

Original Amount	Date Established	Original Recognition Period <sup>(1)</sup>	Amount Recognized in 12/31/2015 Expense <sup>(1)</sup>	Balance of Deferred Inflows 12/31/2015	Balance of Deferred Outflows 12/31/2015
<i>Investment (gains) or losses</i>					
\$27,271,631	12/31/2015	5.0	\$5,454,326	\$0	\$21,817,305
4,161,102	12/31/2014	5.0	832,220	0	2,496,661
<i>Economic/ demographic (gains) or losses</i>					
(2,943,467)	12/31/2015	5.0	(588,693)	2,354,774	0
(227,582)	12/31/2014	5.0	(45,516)	136,549	0
<i>Assumption changes or inputs</i>					
3,176,506	12/31/2015	5.0	635,301	0	2,541,204
0	12/31/2014	5.0	0	0	0

*Employer contributions made subsequent to measurement date <sup>(2)</sup>*

—————Employer Determined—————

<sup>(1)</sup> *Investment (gains)/losses are recognized in pension expense over a period of five years; economic/demographic (gains)/losses and assumption changes or inputs are recognized over the average remaining service life for all active, inactive, and retired members.*

<sup>(2)</sup> *Any eligible employer contributions made subsequent to the measurement date through the employer's fiscal year end should be reflected as outlined in Appendix D of this report.*

## Schedule of Changes in Net Pension Liability and Related Ratios

	Year Ended December 31									
	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
<b>Total Pension Liability</b>										
Service cost	\$8,033,265	\$7,971,478	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Interest on total pension liability	28,029,903	26,719,008	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Effect of plan changes	(1,570,636)	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Effect of assumption changes or inputs	3,176,506	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Effect of economic/demographic (gains) or losses	(2,943,467)	(227,582)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benefit payments/refunds of contributions	<u>(19,704,571)</u>	<u>(18,511,859)</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Net change in total pension liability	15,020,999	15,951,044	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total pension liability, beginning	<u>350,982,921</u>	<u>335,031,877</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Total pension liability, ending (a)	<u>\$366,003,920</u>	<u>\$350,982,921</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
<b>Fiduciary Net Position</b>										
Employer contributions	\$6,534,101	\$6,419,135	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Member contributions	4,072,510	3,997,855	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Investment income net of investment expenses	414,224	22,444,380	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benefit payments/refunds of contributions	(19,704,571)	(18,511,859)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Administrative expenses	(243,373)	(258,882)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other	<u>(34,899)</u>	<u>(117,593)</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Net change in fiduciary net position	(8,962,008)	13,973,035	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, beginning	<u>343,392,910</u>	<u>329,419,875</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Fiduciary net position, ending (b)	<u>\$334,430,902</u>	<u>\$343,392,910</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Net pension liability / (asset), ending = (a) - (b)	<u>\$31,573,018</u>	<u>\$7,590,011</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Fiduciary net position as a % of total pension liability	91.37%	97.84%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pensionable covered payroll	\$58,080,901	\$57,112,219	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net pension liability as a % of covered payroll	54.36%	13.29%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*This schedule is presented to illustrate the requirement to show information for 10 years. However, recalculations of prior years are not required, and if prior years are not reported in accordance with the standards of GASB 67/68, they should not be shown here. Therefore, we have shown only years for which the new GASB statements have been implemented.*

## Schedule of Employer Contributions

Year Ending December 31	Actuarially Determined Contribution <sup>(1)</sup>	Actual Employer Contribution <sup>(1)</sup>	Contribution Deficiency (Excess)	Pensionable Covered Payroll <sup>(2)</sup>	Actual Contribution as a % of Covered Payroll
2006	\$3,986,125	\$3,986,125	\$0	\$42,360,523	9.4%
2007	4,677,362	4,677,362	0	47,534,162	9.8%
2008	4,211,421	5,374,888	(1,163,467)	54,622,846	9.8%
2009	4,152,149	5,440,366	(1,288,217)	55,288,272	9.8%
2010	5,162,016	5,515,118	(353,102)	56,047,951	9.8%
2011	5,070,914	5,070,914	0	55,480,455	9.1%
2012	5,314,265	5,314,265	0	54,338,090	9.8%
2013	5,982,482	6,006,897	(24,415)	57,030,335	10.5%
2014	6,419,135	6,419,135	0	57,112,219	11.2%
2015	6,534,101	6,534,101	0	58,080,901	11.2%

<sup>(1)</sup> TCDRS calculates actuarially determined contributions on a calendar year basis. GASB Statement No. 68 indicates the employer should report employer contribution amounts on a fiscal year basis.

<sup>(2)</sup> Payroll is calculated based on contributions as reported to TCDRS.

## Notes to Schedule

Valuation Date: Actuarially determined contribution rates are calculated each December 31, two years prior to the end of the fiscal year in which contributions are reported.

### Methods and assumptions used to determine contribution rates:

Actuarial Cost Method	Entry Age
Amortization Method	Level percentage of payroll, closed
Remaining Amortization Period	14.7 years (based on contribution rate calculated in 12/31/2015 valuation)
Asset Valuation Method	5-year smoothed market
Inflation	3.0%
Salary Increases	Varies by age and service. 4.9% average over career including inflation.
Investment rate of Return	8.00%, net of investment expenses, including inflation
Retirement Age	Members who are eligible for service retirement are assumed to commence receiving benefit payments based on age. The average age at service retirement for recent retirees is 61.
Mortality	In the 2015 actuarial valuation, assumed life expectancies were adjusted as a result of adopting a new projection scale (110% of the MP-2014 Ultimate Scale) for 2014 and later. Previously Scale AA had been used. The base table is the RP-2000 table projected with Scale AA to 2014.
Changes in Plan Provisions Reflected in the Schedule*	No changes in plan provisions are reflected in the Schedule of Employer Contributions.

*\*Only changes effective 2015 and later are shown in the Notes to Schedule.*



## Appendix A— GASB 68 Plan Description for Galveston County

A description of the pension plan pursuant to Paragraph 40 of GASB Statement No. 68 is as follows:

- a. Galveston County participates in the Texas County & District Retirement System (TCDRS), which is a statewide, agent multiple-employer, public employee retirement system.
- b. A brief description of benefit terms:
  - 1) All full- and part-time non-temporary employees participate in the plan, regardless of the number of hours they work in a year. Employees in a temporary position are not eligible for membership.
  - 2) The plan provides retirement, disability and survivor benefits.
  - 3) TCDRS is a savings-based plan. For the county's plan, 7% of each employee's pay is deposited into his or her TCDRS account. By law, employee accounts earn 7% interest on beginning of year balances annually. At retirement, the account is matched at an employer set percentage (current match is 200%) and is then converted to an annuity.
  - 4) There are no automatic COLAs. Each year, the county may elect an ad hoc COLA for its retirees (if any). There are two COLA types, each limited by actual inflation.
  - 5) Benefit terms are established under the TCDRS Act. They may be amended as of Jan. 1 each year, but must remain in conformity with the Act.
- c. Membership information is shown in the chart below.
- d. The county's contribution rate is calculated annually on an actuarial basis, although the employer may elect to contribute at a higher rate. The Galveston County contribution rate is based on the TCDRS funding policy adopted by the TCDRS Board of Trustees and must conform with the TCDRS Act. The employee contribution rates are set by the county and are currently 7%. Contributions to the pension plan from the county for 2015 are shown in the chart on the prior page.
- e. The most recent comprehensive annual financial report for TCDRS can be found at the following link, [www.tcdrs.org](http://www.tcdrs.org).

### Membership Information

Members	Dec. 31, 2014	Dec. 31, 2015
Number of inactive employees entitled to but not yet receiving benefits:	712	754
Number of active employees:	1,193	1,206
Average monthly salary*:	\$3,916	\$3,983
Average age*:	44.63	44.64
Average length of service in years*:	9.07	9.08
<b>Inactive Employees (or their Beneficiaries) Receiving Benefits</b>		
Number of benefit recipients:	939	969
Average monthly benefit:	\$1,628	\$1,673

*\*Averages reported for all active and inactive employees. Average service includes all proportionate service.*

## Appendix B—Actuarial Methods and Assumptions Used for GASB Calculations

All actuarial methods and assumptions used for this GASB analysis were the same as those used in the December 31, 2015 funding valuation (see Appendix C, following, for details), except as noted below and throughout this report. Please see the Galveston County December 31, 2015 Summary Valuation Report for further details.

Following are the key assumptions and methods used in this GASB analysis.

<b>Valuation Timing</b>	Actuarially determined contribution rates are calculated on a calendar year basis as of December 31, two years prior to the end of the fiscal year in which the contributions are reported.
<b>Actuarial Cost Method</b>	Entry Age Normal <sup>(1)</sup>
<b>Amortization Method</b>	
Recognition of economic/demographic gains or losses	Straight-Line amortization over Expected Working Life
Recognition of assumptions changes or inputs	Straight-Line amortization over Expected Working Life
<b>Asset Valuation Method</b>	
Smoothing period	5 years
Recognition method	Non-asymptotic
Corridor	None
<b>Inflation</b>	Same as funding valuation: See Appendix C
<b>Salary Increases</b>	Same as funding valuation: See Appendix C
<b>Investment Rate of Return</b>	8.10%
<b>Cost-of-Living Adjustments</b>	Cost-of-Living Adjustments for Galveston County are not considered to be substantively automatic under GASB 68. Therefore, no assumption for future cost-of-living adjustments is included in the GASB calculations. No assumption for future cost-of-living adjustments is included in the funding valuation.
<b>Retirement Age</b>	Same as funding valuation: See Appendix C
<b>Turnover</b>	Same as funding valuation: See Appendix C
<b>Mortality</b>	Same as funding valuation: See Appendix C

<sup>(1)</sup> Individual entry age normal cost method, as required by GASB 68, used for GASB calculations. Note that a slightly different version of the entry age normal cost method is used for the funding actuarial valuation.

## Appendix C—Actuarial Methods and Assumptions Used for Funding Valuation

Except where indicated in the section of this GASB 68 report entitled “Actuarial Methods and Assumptions Used for GASB Calculations”, the assumptions used in this analysis for the December 31, 2015 financial reporting metrics are the same as those used in the December 31, 2015 actuarial valuation analysis for Galveston County.

Following is a description of the assumptions used in the December 31, 2015 actuarial valuation analysis for Galveston County. This information may also be found in the Galveston County December 31, 2015 Summary Valuation Report.

### Economic Assumptions

#### TCDRS system-wide economic assumptions:

Real rate of return	5.0%
Inflation	3.0%
Long-term investment return	8.0%

The assumed long-term investment return of 8% is net after investment and administrative expenses. It is assumed returns will equal the nominal annual rate of 8% for calculating the actuarial accrued liability and the normal cost contribution rate for the retirement plan of each participating employer.

The annual salary increase rates assumed for individual members vary by length of service and by entry-age group. The annual rates consist of a general wage inflation component of 3.5% (made up of 3.0% inflation and 0.5% productivity increase assumptions) and a merit, promotion and longevity component that on average approximates 1.4% per year for a career employee. (See Table 1 for Merit Salary Increases.)

#### Employer-specific economic assumptions:

Growth in membership	0.0%
Payroll growth for funding calculations	3.5%

The payroll growth assumption is for the aggregate covered payroll of an employer.

**Table 1**  
**Merit Salary Increases\***

Years of Service	Entry Age			
	Before 30	Ages 30-39	Ages 40-49	50 and later
0	5.25%	4.75%	4.25%	3.75%
1	4.50	4.00	3.50	3.00
2	4.00	3.50	3.00	2.50
3	3.50	3.00	2.50	2.00
4	3.00	2.50	2.00	1.50
5	2.65	2.15	1.65	1.15
6	2.40	1.90	1.40	0.90
7	2.20	1.70	1.20	0.70
8	2.05	1.55	1.05	0.55
9	1.95	1.45	0.95	0.45
10	1.85	1.35	0.85	0.40
11	1.75	1.25	0.75	0.40
12	1.65	1.15	0.65	0.40
13	1.55	1.05	0.55	0.40
14	1.56	0.95	0.45	0.40
15	1.35	0.90	0.40	0.40
16	1.25	0.85	0.40	0.40
17	1.15	0.80	0.40	0.40
18	1.10	0.75	0.40	0.40
19	1.05	0.70	0.40	0.40
20	1.00	0.65	0.40	0.40
21	0.95	0.60	0.40	0.40
22	0.90	0.55	0.40	0.40
23	0.85	0.50	0.40	0.40
24	0.80	0.45	0.40	0.40
25	0.75	0.40	0.40	0.40
26	0.70	0.40	0.40	0.40
27	0.65	0.40	0.40	0.40
28	0.60	0.40	0.40	0.40
29	0.55	0.40	0.40	0.40
30 & Up	0.50	0.40	0.40	0.40

\* These rates do not include the wage inflation rate of 3.5% per year. For example, a member who entered the system at age 20 and is in the first year of service is assumed to receive an 8.93% total annual increase in his salary. The 8.93% is a combination of the 5.25% merit increase and the 3.5% wage inflation. Note that the two components are compounded, so it is a slightly different result than just adding the two percentages.

## Demographic Assumptions

### TCDRS system-wide demographic assumptions:

**Replacement of Terminated Members** — New employees are assumed to replace any terminated members and have similar entry ages.

**Disability** — The rates of disability used in this valuation are illustrated in Table 2. Members who become disabled are eligible to commence benefit payments regardless of age. Rates of disability are in a custom table based on TCDRS experience.

**Table 2**  
**Annual Rates of Disability\***

Age	Work Related Male and Female	All Other Causes Male and Female	Age	Work Related Male and Female	All Other Causes Male and Female
less than 25	0.000%	0.000%	43	0.005%	0.072%
25	0.000	0.000	44	0.005	0.079
26	0.000	0.000	45	0.006	0.086
27	0.000	0.000	46	0.006	0.095
28	0.000	0.010	47	0.007	0.105
29	0.000	0.010	48	0.007	0.119
30	0.000	0.011	49	0.008	0.136
31	0.000	0.012	50	0.009	0.156
32	0.000	0.012	51	0.009	0.178
33	0.000	0.014	52	0.010	0.203
34	0.000	0.018	53	0.011	0.229
35	0.001	0.023	54	0.012	0.254
36	0.001	0.028	55	0.014	0.278
37	0.001	0.035	56	0.016	0.297
38	0.002	0.041	57	0.018	0.312
39	0.002	0.047	58	0.022	0.325
40	0.003	0.053	59	0.024	0.337
41	0.004	0.059	60 & Above	0.000	0.000
42	0.004	0.066			

\* The probability of disablement from all other causes is applicable for members who are vested but not eligible for service retirement. Before a member is vested, only the work related disability provisions are applicable.

### Mortality

Depositing members	The RP-2000 Active Employee Mortality Table for males with a two-year set-forward and the RP-2000 Active Employee Mortality Table for females with a four-year setback, both projected to 2014 with scale AA and then projected with 110% of the MP-2014 Ultimate scale after that.
Service retirees, beneficiaries and non-depositing members	The RP-2000 Combined Mortality Table projected to 2014 with scale AA and then projected with 110% of the MP-2014 Ultimate scale after that, with a one-year set-forward for males and no age adjustment for females.
Disabled retirees	RP-2000 Disabled Mortality Table projected to 2014 with scale AA and then projected with 110% of the MP-2014 Ultimate scale after that, with no age adjustment for males and a two-year set-forward for females.

**Family Composition** — For current retirees, beneficiary information is supplied by TCDRS. For purposes of calculating the Survivor Benefit for current depositing and non-depositing members, male members are assumed to have a female beneficiary who is three years younger. Female members are assumed to have a male beneficiary who is three years older.

**Service Retirement** — Members eligible for service retirement are assumed to retire at the rates shown in Table 3.

**Table 3  
Annual Rates of Service Retirement\***

Age	Male	Female
40-44	4.5%	4.5%
45-40	9.0	9.0
50	10.0	10.0
51	10.0	10.0
52	10.5	10.5
53	10.5	10.5
54	10.5	10.5
55	11.0	11.0
56	11.0	11.0
57	11.0	11.0
58	12.0	12.0
59	12.0	12.0
60	14.0	14.0
61	12.0	12.0

  

Age	Male	Female
62	25.0%	25.0%
63	16.0	16.0
64	16.0	16.0
65	30.0	30.0
66	25.0	25.0
67	24.0	24.0
68	22.0	22.0
69	22.0	22.0
70	22.0	22.0
71	22.0	22.0
72	22.0	22.0
73	22.0	22.0
74**	22.0	22.0

\* *Deferred members are assumed to retire (100% probability) at the later of:*

- a) *age 60*
- b) *earliest retirement eligibility.*

\*\* *For all eligible members ages 75 and later, retirement is assumed to occur immediately.*

**Employer-specific demographic assumptions:**

**Other Terminations of Employment** — The rate of assumed future termination from active participation in the plan for reasons other than death, disability or retirement are illustrated in Table 4. The rates vary by length of service, entry-age group (age at hire) and gender. No termination after eligibility for retirement is assumed.

**Table 4**  
**Annual Rates of Termination**

Years of Service	Entry Age 20		Entry Age 30		Entry Age 40		Entry Age 50	
	Male	Female	Male	Female	Male	Female	Male	Female
0	33.1%	35.9%	27.4%	29.6%	24.5%	26.5%	21.6%	23.4%
1	22.1	23.9	18.2	19.8	16.3	17.7	14.4	15.6
2	16.6	17.9	13.7	14.8	12.2	13.3	10.8	11.7
3	13.3	14.4	10.9	11.9	9.8	10.6	8.6	9.4
4	11.0	12.0	9.1	9.9	8.2	8.8	7.2	7.8
5	9.4	10.2	7.8	8.4	6.9	7.5	6.1	6.6
6	7.7	8.4	6.4	6.9	5.7	6.2	5.0	5.5
7	6.6	7.2	5.5	5.9	4.9	5.3	4.3	4.7
8	6.1	6.6	5.0	5.4	4.5	4.9	4.0	4.3
9	5.5	6.0	4.6	4.9	4.1	4.4	3.6	3.9
10	5.0	5.4	4.1	4.5	3.7	4.0	3.2	3.5
11	4.4	4.8	3.7	4.0	3.3	3.5	2.9	3.1
12	4.0	4.3	3.3	3.6	2.9	3.2	2.6	2.8
13	3.5	3.8	2.9	3.2	2.6	2.8	2.3	2.5
14	3.1	3.4	2.6	2.8	2.3	2.5	2.0	2.2
15	2.7	2.9	2.2	2.4	2.0	2.1	1.7	1.9
16	2.3	2.5	1.9	2.1	1.7	1.9	1.5	1.6
17	2.0	2.2	1.6	1.8	1.5	1.6	1.3	1.4
18	1.8	1.9	1.5	1.6	1.3	1.4	1.2	1.3
19	1.7	1.8	1.4	1.5	1.2	1.3	1.1	1.2
20	1.7	1.8	1.4	1.5	1.2	1.3	1.1	1.2
21	1.5	1.6	1.2	1.3	1.1	1.2	1.0	1.1
22	1.3	1.4	1.1	1.2	1.0	1.1	0.9	0.9
23	1.2	1.3	1.0	1.0	0.9	0.9	0.8	0.8
24	1.0	1.1	0.8	0.9	0.7	0.8	0.7	0.7
25	0.9	1.0	0.7	0.8	0.7	0.7	0.6	0.6
26	0.8	0.8	0.6	0.7	0.6	0.6	0.5	0.5
27	0.7	0.7	0.5	0.6	0.5	0.5	0.4	0.5
28	0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.4
29	0.4	0.5	0.4	0.4	0.3	0.4	0.3	0.3
30 & Later	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Withdrawals** — Members who terminate may either elect to leave their account with TCDRS or withdraw their funds. The probability that a member elects a withdrawal varies by length of service and vesting schedule. Rates applied to your plan are shown in Table 5. For non-depositing members who are not vested, 100% are assumed to elect a withdrawal.

**Table 5  
Probability of Withdrawal**

Years of Service	Probability	Years of Service	Probability
0	100%	15	40
1	100	16	38
2	100	17	36
3	100	18	34
4	100	19	32
5	100	20	30
6	100	21	28
7	100	22	26
8	50	23	24
9	49	24	22
10	48	25	20
11	47	26	15
12	46	27	10
13	44	28*	5
14	42		

*\* Members with more than 28 years of service are not assumed to refund.*



## Appendix D—Contributions Made Subsequent to Measurement Date

GASB Statement No. 71 (“GASB 71”), *Pension Transition for Contributions Made Subsequent to the Measurement Date – an Amendment of GASB Statement No. 68*, requires employer contributions made between the measurement date, which is the date used to determine an employer’s net pension liability (“NPL”), and the employer’s fiscal year end be reported as a deferred outflow of resources (“DOoR”). The statement “requires a beginning deferred outflow of resources for its pension contributions, if any, made subsequent to the measurement date of the beginning net pension liability.”

For GASB valuation purposes, TCDRS’ consulting actuary will compute each participating employer’s NPL as of Dec. 31 of each year. Employers that have a fiscal year end other than Dec. 31 will need to account for pension contributions (employer; not employee contributions and group term life premiums) made between Dec. 31 and the employer’s fiscal year end as a DOoR. These contributions will not be reported to you as part of this GASB report; employers can access their monthly employer activity statements, which display contributions made by the employer, along with any group term life premium offsets, via the TCDRS Employer Portal.

An example may help. An employer, with a March 31 fiscal year end, will implement GASB 68 requirements for its fiscal year end March 31, 2016. To transition to the new GASB requirements, the employer will record:

- a beginning NPL determined as of the Dec. 31, 2014 measurement date, and
- a beginning DOoR for pension contributions made after Dec. 31, 2014 through the beginning of the employer’s fiscal year, which equates to March 31, 2015.

The employer’s Dec. 31, 2014 NPL is computed to be \$1,000,000. The employer’s pension contributions made after Dec. 31, 2014 to March 31, 2015 total \$200,000. The initial implementation entry would be:

	Debit	Credit
Net position	\$800,000	
DOoR – Contributions after the measurement date	\$200,000	
Initial NPL		\$1,000,000

## Appendix E—Summary of TCDRS Funding Policy

### Texas County & District Retirement System Funding Policy

Effective as of the Dec. 31, 2014 valuation

#### Introduction

The funding policy governs how the Texas County & District Retirement System (TCDRS) determines the employer contributions required to ensure that benefits provided to TCDRS members are funded in a reasonable and equitable manner. The goals of TCDRS' funding policy are to fully fund benefits over the course of employees' careers to ensure intergenerational equity, and to balance rate and benefit stability with the need for the plan funding to be reflective of current plan conditions.

This policy documents the current funding policies in effect for the Dec. 31, 2015 actuarial valuation as established by state law, administrative rule and action by the TCDRS Board of Trustees (the board). The policy serves as a comprehensive funding overview and complies with the GASB reporting requirements for an agent multiple-employer plan.

#### TCDRS funding overview

TCDRS is a model for responsible, disciplined funding. TCDRS does not receive any state funding. As an agent, multiple-employer plan, each participating employer in the system funds its plan independently. A combination of three elements funds each employer's plan: employee deposits, employer contributions and investment income.

- The deposit rate for employees is 4%, 5%, 6% or 7% of compensation, as adopted by the employer's governing body.
- Participating employers are required to contribute at actuarially determined rates to ensure adequate funding for each employer's plan. Employer contribution rates are determined annually and approved by the TCDRS Board of Trustees.
- Investment income funds a large part of the benefits employees earn.

Pursuant to state law, employers participating in the system must pay 100% of their actuarially determined required contributions on an annual basis.

Each employer has the opportunity to make additional contributions in excess of its annual required contribution rate either by adopting an elected rate that is higher than the required rate or by making additional contributions on an ad hoc basis. Employers may make additional contributions to pay down their liabilities faster, pre-fund benefit enhancements and/or buffer against future adverse experience.

In addition, employers annually review their plans and may adjust benefits and costs based on their local needs and budgets. Although accrued benefits may not be reduced, employers may reduce future benefit accruals and immediately reduce costs.

### **Methodology for determining employer contribution rates**

The board hires independent outside consulting actuaries to conduct an annual valuation to measure the funding status and to determine the required employer contribution rate for each employer plan. In order to calculate the employer contribution rate, the actuary does the following:

- Studies each employer's adopted plan of benefits and the profile of its plan participants, and uses assumptions established by the board to estimate future benefit payments.
- Discounts the estimate of future benefit payments to the present based on the long-term rate of investment return to determine the present value of future benefits.
- Compares the present value of future benefits with the plan's assets to determine the difference that needs to be funded based on the funding policy.

The valuation of each employer plan is based on the system funding policy and the assets, benefits and participant profile of each participating employer plan. The four key components in the determination of employer contribution rates are: the actuarial cost method, amortization policy, the asset valuation method and the actuarial assumptions.

#### ***Actuarial cost method***

TCDRS has adopted the replacement life entry age cost method, a conservative cost method and an industry standard. The goal of this cost method is to fund benefits in an orderly manner for each participant over his or her career so that sufficient funds are accumulated by the time benefit payments begin. Under this approach, benefits are funded in advance as a level percentage of pay. This portion of the contribution rate is called the normal cost rate and generally remains stable from year to year.

#### ***Amortization policy***

The portion of the contribution rate that funds any remaining unfunded amounts for benefits that are not covered by the normal cost is called the unfunded actuarial accrued liability (UAAL) rate. UAAL amounts occur when benefit enhancements are adopted that have not been funded in advance, or when actual investment or demographic experience varies from the actuarial assumptions (actuarial gains and losses). UAAL amounts are amortized on a level-percentage-of-covered-payroll basis over a closed period with a layered approach. The closed periods ensure all unfunded liabilities are financed over no more than 20 years from the time they occur. Each year new layers are established to amortize changes in the UAAL due to actuarial gains or losses, as well as any plan benefit changes elected by an employer for that year.

Benefit enhancements are amortized over a 15-year closed period. All other changes in the UAAL are amortized over 20-year closed periods. These amortization periods are generally more conservative than those of most other public retirement plans and are stricter than the minimum amortization period required under state law.

For newly participating districts that have five or fewer employees who are all within five years of retirement eligibility, any initial UAAL and any subsequent adoption of prior service credits are amortized over a five-year closed amortization period. This ensures that benefits are appropriately funded over the current generation of employees.

Notwithstanding the layered approach, the total UAAL payment may not be less than the required payment obtained by amortizing the entire UAAL over a 20-year period.

If a plan is overfunded, the overfunded actuarial accrued liability (OAAL) is calculated annually using a 30-year open amortization period.

### ***Asset valuation method***

When determining the actuarial value of assets used for measuring a plan's funded status, TCDRS smooths each year's actuarial investment gains and losses and recognizes them over a five-year period to better reflect the system's long-term investment horizons and to keep employer contribution rates more stable. As actuarial asset investment gains and losses are recognized, they become part of the actuarial gains and losses for the year and are funded according to the amortization policy. The five-year period helps stabilize employer rates while still ensuring that rates are reflective of current market conditions.

In addition, the board has the ability to set aside reserves from investment earnings that are used to help offset future negative economic cycles. These reserves are held separately and are not counted as part of a participating employer's plan assets until they are passed through to employers when determined necessary by the board. Reserves help maintain rate stability for employers. In addition, reserves ensure that employers do not adopt benefit increases based on a temporarily lower plan cost at a high point in a market cycle and, conversely, are not as pressured to immediately reduce benefit levels during a low point in a market cycle.

### ***Actuarial assumptions***

Demographic and economic assumptions are used to estimate employer liabilities and to determine the amount of funding required from employer contributions as opposed to investment earnings. These assumptions reflect a long-term perspective of 30 years or more. Examples of key economic assumptions include long-term investment return, long-term inflation and annual payroll increase.

Demographic assumptions are the actuary's best estimate of what will happen to TCDRS members and retirees. Examples of demographic assumptions are employment termination rates, retirement rates and retiree mortality rates. A complete listing of all actuarial assumptions can be found in the annual system-wide valuation report.

### **Oversight**

The board has established review policies to ensure that actuarial assumptions are appropriate and that the methodology for determining employer contribution rates is being correctly applied.

### ***Review of actuarial assumptions***

TCDRS' actuarial assumptions are periodically reviewed and revised as deemed necessary to reflect best estimates of future experience. Every four years, the TCDRS consulting actuary conducts an investigation of experience. TCDRS assumptions are compared to plan experience and future expectations, and changes to

the assumptions are recommended as needed. The board adopts actuarial assumptions to be used in the valuation based on the results of this study.

An actuarial audit of every investigation of experience is required and must be performed by an independent auditing actuary to review the consulting actuary's analysis, conclusions and recommendations for accuracy, appropriateness and reasonableness. These audits alternate between a peer review and a full replication audit of the investigation of experience. In a peer review audit of the investigation, the reviewing actuary uses the raw results of the investigation for demographic assumptions as calculated by the consulting actuary to test the conclusions and recommendations. In addition, the reviewing actuary independently analyzes economic assumptions to test the results and recommendations of the consulting actuary. The reviewing actuary also examines the consulting actuary's methods and assumptions for reasonableness and internal consistency. In a full replication audit of the investigation, in addition to performing all of the steps of a peer review, the auditing actuary fully replicates the calculation of the investigation's raw results.

#### ***Review of employer contribution rates***

In order to test accuracy and ensure that the actuarial methods and assumptions are being correctly applied, an audit of the valuation is required every four years. These audits are conducted by an independent reviewing actuary and alternate between a peer review and a full replication audit of the valuation. In the peer review audit of the valuation, the actuary uses a sample of participant data and TCDRS plans to test the results of the valuation. The reviewing actuary also examines the consulting actuary's methods and assumptions for reasonableness and internal consistency. In a full replication audit of the valuation, the auditing actuary performs all the steps of a peer review audit but instead of analyzing sample data and plans, the auditing actuary fully replicates the original actuarial valuation.

#### ***Review and modification of funding policy***

The board will review this policy on a regular basis and may modify this policy at its discretion. Modifications to the policy may be submitted for consideration to the board by staff and/or outside consulting actuaries as circumstances warrant.

## Appendix F—Glossary

<b>Actuarially Determined Contribution</b>	The required contribution that is calculated for the reporting period, determined based on the funding policy and the annual valuation.
<b>Deferred Inflows/Outflows of Resources</b>	Portion of changes in net pension liability that is not immediately recognized in Pension Expense. These changes include differences between expected and actual experience, changes in assumptions, and differences between expected and actual earnings on plan investments.
<b>Discount Rate</b>	Single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the sum of: <ol style="list-style-type: none"><li>1) The actuarial present value of benefit payments projected to be made in future periods where the plan assets are projected to be sufficient to meet benefit payments, calculated using the Long-Term Expected Rate of Return.</li><li>2) The actuarial present value of projected benefit payments not included in (1), calculated using the Municipal Bond Rate.</li></ol>
<b>Fiduciary Net Position</b>	Equal to market value of assets.
<b>Long-Term Expected Rate of Return</b>	Long-term expected rate of return on pension plan investments expected to be used to finance the payment of benefits.
<b>Municipal Bond Rate</b>	Yield or index rate for 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher.
<b>Net Pension Liability / (Asset)</b>	Total Pension Liability minus the Plan's Fiduciary Net Position.
<b>Projected Benefit Payments</b>	All benefits estimated to be payable through the pension plan to current active and inactive employees as a result of their past service and expected future service.
<b>Service Cost</b>	The portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<b>Total Pension Liability</b>	The portion of actuarial present value of projected benefit payments that is attributable to past periods of member service using the Entry Age Normal cost method based on the requirements of GASB 67 and 68.