



Maryland Transit Administration Pension Plan

GASB68 Actuarial Information for the
Measurement Period Ending
June 30, 2019

Bolton

Submitted by:

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October 10, 2019

Heidi Tarleton
Deputy Chief Financial Officer
Maryland Transit Administration
6 St. Paul Street, 8th floor
Baltimore, MD 21202

Re: MTA Pension Plan – GASB68 Actuarial Information for the Measurement Period Ending June 30, 2019

Dear Heidi,

The following report contains the GASB67 and GASB68 actuarial information to be included with the MTA's financial statements for FYE 2019. The GASB68 information has been provided as of the June 30, 2019 measurement date for FYE 2019.

Employee Contribution Treatment

Asset information was provided by the State Retirement Agency (SRA) and the MTA. Employee contributions were instituted in July 2016. At the time SRA recommended reimbursing MTA for the monthly pension benefit payments net of the employee contributions rather than accepting the employee contributions from MTA and then simultaneously reimbursing MTA for the full amount of the payments. The effect on the assets of the Plan would have been the same. The FYE 2017 and FYE 2018 financial statements properly reflected the employee contributions and total plan assets. In FYE 2019 MTA contributed one lump sum amount equal to the employee contributions for FYE 2017, FYE 2018 and an estimated amount for FYE 2019. The FYE 2019 actual employee contributions were less than the estimated amount. The employee contributions for FYE 2017 and FYE 2018 paid to SRA by MTA in FYE 2019 were overpayments to the trust based on the previous treatment mentioned above. Therefore, MTA is due a refund in FYE 2020 for this amount along with a refund for the excess of the estimated FYE 2019 employee contributions over the actual amount.

Methodology, Reliance and Certification

This report is prepared for the Maryland Transit Administration (MTA). The report contains the actuarial information to be included with the MTA's financial statements for the year ending June 30, 2019 (the MTA's fiscal year end date) as required by GASB68. This information has been prepared for use in the financial statements of the MTA. This information is not intended for, nor should it be used for, any additional purposes.

Methodology, Reliance and Certification (cont.)

The total pension liability is based on the July 1, 2018 actuarial valuation rolled forward to June 30, 2019. The methods, assumptions, and participant data used are detailed in the July 1, 2018 actuarial valuation report with the exception of the actuarial cost method and COLA assumption. These calculations are based on the Entry Age Normal cost method as required by GASB68. The COLA assumption was lowered from 2.5% to 2.1% based on the experience study dated August 16, 2019.

The included calculations are based on a blended discount rate of 4.53%. The plan's expected gross rate of investment return of 8.15% has been blended with the 3.13% yield corresponding to the 20-year maturity on a municipal general obligation AA bond yield curve published on Fidelity's Fixed Income Market Data webpage as of June 30, 2019. The development of the blended discount rate is included within this report. The projected benefits for purposes of this report include expected Cost-of-Living Adjustments (COLAs) to benefits for pensioners and beneficiaries of 2.10% per year. Although there is not a firm promise to provide COLAs, there is a pattern of providing annual increases and, as such, they have been included as part of the substantive plan.

The calculation of the actuarially determined contribution (ADC) for the fiscal year ended June 30, 2019 is contained in the July 1, 2018 actuarial valuation report. The included calculations assume that the members and the County will continue to make all required actuarially determined contributions. Based on that assumption, the plan's fiduciary net position is not expected to be available to make all future benefit payments of current plan members.

The long-term nominal expected rate of return on pension plan investments was selected by the State of Maryland.

These calculations and comparisons with assets are applicable for the valuation date only. The future is uncertain, and the plan may become better funded or more poorly funded in the future. This valuation does not provide any guarantee that the plan will be able to provide the promised benefits in the future.

This is a deterministic valuation in that it is based on a single set of assumptions. This set of assumptions is one possible basis for our calculations. Other assumptions may be equally valid. The future is uncertain and the plan's actual experience will differ from those assumptions; these differences may be significant or material because these results are very sensitive to the assumptions made and, in some cases, to the interaction between the assumptions. We may consider that some factors are not material to the valuation of the plan and may not provide a specific assumption for those factors. We may have used other assumptions in the past. We will likely consider changes in assumptions at a future date.

The MTA is responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in this report. The MTA is solely responsible for communicating to Bolton Partners, Inc. any changes required thereto.

The MTA could reasonably ask how the valuation would change if we used a different assumption set or if plan experience exhibited variations from our assumptions. This report does not contain such an analysis. This type of analysis would be a separate assignment.



Methodology, Reliance and Certification (cont.)

The cost of this plan is determined by the benefits promised by the plan, the plan's participant population, the investment experience of the plan and many other factors. An actuarial valuation is a budgeting tool for the MTA or, in this case, a measure of accounting expense. It does not affect the cost of the plan. As the experience of the plan evolves, it is normal for the level of contributions and expense of the plan to change. If a contribution is not made for a particular year, either by deliberate choice or because of an error in a calculation, that contribution can be made in later years. We will not be responsible for contributions that are made at a future time rather than an earlier time. The plan sponsor is responsible for funding the cost of the plan.

We make every effort to ensure that our calculations are accurately performed. These calculations are complex. Despite our best efforts, we may make a mistake. We reserve the right to correct any potential errors by amending the results of this report or by including the corrections in a future valuation report.

Because modeling all aspects of a situation is not possible or practical, we may use summary information, estimates, or simplifications of calculations to facilitate the modeling of future events in an efficient and cost-effective manner. We may also exclude factors or data that are immaterial in our judgment. Use of such simplifying techniques does not, in our judgment, affect the reasonableness of valuation results for the plan.

This report is based on plan provisions, census data, and asset data submitted by the MTA. We have relied on this information for purposes of preparing this report, but have not performed an audit. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. The plan sponsor is solely responsible for the validity and completeness of this information.

The MTA is solely responsible for selecting the plan's investment policies, asset allocations and individual investments. Bolton Partners, Inc.'s actuaries have not provided any investment advice to the MTA.

The information in this report was prepared for the internal use of the MTA, the plan and their auditors in connection with our actuarial valuations of the pension plan as required by GASB68. This report may not be used for any other purpose; Bolton Partners, Inc. is not responsible for the consequences of any unauthorized use or the reliance on this information by any other party.

The calculation of actuarial liabilities for valuation purposes is based on a current estimate of future benefit payments. The calculation includes a computation of the "present value" of those estimated future benefit payments using an assumed discount rate; the higher the discount rate assumption, the lower the estimated liability will be. For purposes of estimating the liabilities (future and accrued) in this report, you selected an assumption based on the expected long-term rate of return on plan investments. Using a lower discount rate assumption, such as a rate based on long-term bond yields, could substantially increase the estimated present value of future and accrued liabilities.

This report provides certain financial calculations for use by the auditor. These values have been computed in accordance with our understanding of generally accepted actuarial principles and practices and fairly reflect the actuarial position of the plan. The various actuarial assumptions and methods which have been used are, in our opinion, appropriate for the purposes of this report.



Methodology, Reliance and Certification (cont.)

The report is conditioned on the assumption of an ongoing plan and is not meant to present the actuarial position of the plan in the case of plan termination. 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 undersigned credentialed actuary meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. The July 1, 2018 actuarial valuation report contains information that is integral to the results contained herein and a copy may be provided upon request.

Sincerely,



Kevin Binder, FSA, EA, MAAA



Jordan McClane, FSA, EA, MAAA



Maryland Transit Administration Pension Plan

Actuarial Information to Include in the Financial Statements
for the June 30, 2019 Measurement Date

Net Pension Liability

The components of the net pension liability at June 30, 2019, were as follows:

Total pension liability	\$ 1,254,698,383
Plan fiduciary net position	(322,304,417)
Employer's net pension liability	\$ 932,393,966
Plan fiduciary net position as a percentage of the total pension liability	25.69%

Actuarial assumptions. The total pension liability was determined by an actuarial valuation as of July 1, 2018 rolled forward to June 30, 2019 using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	3.2 percent
Salary increases	Rates vary by participant service
Investment rate of return	7.50 percent, net of pension plan investment expense, including inflation for funded benefits.
Mortality	RP-2014 Blue Collar tables with MP-2014. The RP-2014 Disabled Retiree table with MP-2014 is used for disabled members.

The above is a summary of key actuarial assumptions. Full descriptions of the actuarial assumptions are available in the July 1, 2018 actuarial valuation report.

Sensitivity of the net pension liability to changes in the discount rate

	1% Decrease 3.53%	Current Discount Rate 4.53%	1% Increase 5.53%
Employer's net pension liability	\$ 1,124,206,235	\$ 932,393,966	\$ 775,604,158

Maryland Transit Administration Pension Plan
 Actuarial Information to Include in the Financial Statements
 for the June 30, 2019 Measurement Date

Changes in the Net Pension Liability

	Total Pension Liability (a)	Increase (Decrease) Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balances at 6/30/18	\$ 1,271,782,218	\$ 298,446,827	\$ 973,335,391
Changes for the year:			
Service cost	36,026,872		36,026,872
Interest	56,518,997		56,518,997
Changes of benefit terms	(202,648)		(202,648)
Differences between expected and actual experience	(8,527,580)		(8,527,580)
Changes of assumptions	(58,175,626)		(58,175,626)
Contributions - employer		41,597,059	(41,597,059)
Contributions - member		3,005,759	(3,005,759)
Net Investment Income ¹		31,023,630	(31,023,630)
Benefit payments, including refunds of member contributions	(42,723,850)	(42,723,850)	-
Administrative expense		(2,325,372)	2,325,372
Other ²		(6,719,636)	6,719,636
Net Changes	(17,083,835)	23,857,590	(40,941,425)
Balances at 6/30/19	\$ 1,254,698,383	\$ 322,304,417	\$ 932,393,966

¹ Includes investment income and dividends and the increase/(decrease) in the market value of investments

²

The refund due to the plan is comprised of FYE 2017 employee contributions in the amount of \$3,094,029, FYE 2018 employee contributions in the amount of \$3,315,683, and overpayments in employee contributions for FYE 2019 in the amount of \$309,924.

Maryland Transit Administration Pension Plan

Actuarial Information to Include in the Financial Statements for the June 30, 2019 Measurement Date

Components of Employer's Pension Expense for the Fiscal Year Ended June 30, 2019

Note	Description	Amount
A	Service cost	\$ 36,026,872
B	Interest on the total pension liability	56,518,997
A	Changes of benefit terms	(202,648)
C	Differences between expected and actual experience	(6,436,125)
C	Changes of assumptions	16,985,605
A	Employee contributions	(3,005,759)
D	Projected earnings on pension plan investments	(24,031,400)
C	Differences between expected and actual earnings on plan investments	(4,251,385)
A	Pension plan administrative expense	2,325,372
A	Other changes in fiduciary net position	6,719,636
Total Pension Expense		\$ 80,649,165

Notes:

- A Provided in the Changes in Net Pension Liability exhibit.
 B Based on the following calculation:

	Amount for Period (a)	Portion of Period (b)	Discount Rate (c)	Interest on the Pension Liability (a) x (b) x (c)
Beginning total pension liability	\$ 1,271,782,218	100%	4.52%	\$ 57,484,556
Service cost (end of year)	38,875,781	0%	4.52%	-
Benefit payments, including refunds of employee contributions	(42,723,850)	50%	4.52%	(965,559)
Total interest on the total pension liability				\$ 56,518,997

- C Provided in the Schedules of Deferrals.
 D Based on the following calculation:

	Amount for Period (a)	Portion of Period (b)	Projected Rate of Return (c)	Projected Earnings (a) x (b) x (c)
Beginning plan fiduciary net position	\$ 298,446,827	100%	8.15%	\$ 24,323,416
Employer contributions	41,597,059	50%	8.15%	1,695,080
Employee contributions	3,005,759	50%	8.15%	122,485
Benefit payments, including refunds of employee contributions	(42,723,850)	50%	8.15%	(1,740,997)
Administrative expense and other	(9,045,008)	50%	8.15%	(368,584)
Total Projected Earnings				\$ 24,031,400

Maryland Transit Administration Pension Plan

Actuarial Information to Include in the Financial Statements for the June 30, 2019 Measurement Date

Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

At June 30, 2019, the Employer reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$ 11,589,910	\$ 31,003,309
Changes of assumptions	160,544,126	165,999,036
Net difference between projected and actual earnings on pension plan investments	-	8,374,341
Total	\$ 172,134,036	\$ 205,376,686

Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

Year ended June 30:	
2020	\$ 7,085,784
2021	8,028,431
2022	4,721,353
2023	(41,961,017)
2024	(11,117,201)
Thereafter	-

Maryland Transit Administration Pension Plan
 Actuarial Information to Include in the Financial Statements
 for the June 30, 2019 Measurement Date

Changes in the Net Pension Liability and Related Ratios
 Last 10 Fiscal Years (Dollars amounts in thousands)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Total pension liability										
Service cost	\$ 36,027	\$ 37,195	\$ 36,334	\$ 48,499	\$ 24,718	\$ 19,438				
Interest	56,519	54,904	57,881	31,181	39,237	43,472				
Changes of benefit terms	(203)	3,106	2,133	82,510	-	-				
Differences between expected and actual experience	(8,528)	17,385	(20,741)	(15,024)	(19,621)	4,025				
Changes of assumptions	(58,176)	(36,903)	(162,606)	338,950	53,480	38,643				Information for FY2013 and earlier is not available
Benefit payments, including refunds of member contributions	(42,724)	(37,203)	(39,062)	(35,283)	(30,636)	(32,598)				
Net change in total pension liability	(17,084)	38,483	(126,062)	450,833	67,177	72,980				
Total pension liability - beginning	1,271,782	1,233,299	1,359,361	908,528	841,351	768,371				
Total pension liability - ending (a)	\$ 1,254,698	\$ 1,271,782	\$ 1,233,299	\$ 1,359,361	\$ 908,528	\$ 841,351				
Plan fiduciary net position										
Contributions - employer	\$ 41,597	\$ 40,997	\$ 40,997	\$ 40,997	\$ 35,400	\$ 39,749				
Contributions - member	3,006	3,316	3,094	-	-	-				
Net investment income	31,024	20,550	27,741	12,768	14,045	15,783				
Benefit payments, including refunds of member contributions	(42,724)	(37,203)	(39,062)	(35,283)	(30,636)	(32,598)				
Administrative expense	(2,325)	(2,213)	(1,914)	(1,967)	(1,851)	(1,587)				
Other	(6,720)	-	(2,631)	-	-	-				
Net change in plan fiduciary net position	\$ 23,858	\$ 25,447	\$ 28,225	\$ 16,515	\$ 16,958	\$ 21,347				
Plan fiduciary net position - beginning	298,447	273,000	244,776	228,261	211,303	189,957				
Plan fiduciary net position - ending (b)	\$ 322,304	\$ 298,447	\$ 273,000	\$ 244,776	\$ 228,261	\$ 211,303				
Net pension liability - ending (a)-(b)	\$ 932,394	\$ 973,335	\$ 960,299	\$ 1,114,585	\$ 680,267	\$ 630,048				
Plan fiduciary net position as a percentage of the total pension liability	25.69%	23.47%	22.14%	18.01%	25.12%	25.11%				
Covered payroll	\$ 148,445	\$ 145,834	\$ 137,154	\$ 137,427	\$ 135,545	\$ 137,596				
Net pension liability as a percentage of covered payroll	628.11%	667.43%	700.16%	811.04%	501.88%	457.90%				
Expected average remaining service years of all participants	6	6	7	7	7	7				

Notes to Schedule:

Benefit changes: FY 19 reflects that for Local 1859 employees, effective October 27, 2017, the dollar per month maximum benefit was eliminated, the vesting requirement was increased to 10 years, pensionable earnings were limited to 2,392 pay hours in any calendar year, and employee contributions increased to 2%.

Changes of assumptions: FY19 reflects an increase to the effective discount rate from 4.52% to 4.53%. Also, the COLA assumption was changed from 2.5% to 2.1% for GASB purposes.

Maryland Transit Administration Pension Plan

Actuarial Information to Include in the Financial Statements
for the June 30, 2019 Measurement Date

Schedule of Employer Contributions Last 10 Fiscal Years (Dollar amounts in thousands)

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined contribution	\$ 64,649	\$ 66,495	\$ 62,217	\$ 44,736	\$ 40,807	\$ 39,749				
Contributions in relation to the actuarially determined contribution	41,597	40,997	40,997	40,997	35,400	39,749				
Contribution deficiency (excess)	\$ 23,052	\$ 25,498	\$ 21,220	\$ 3,739	\$ 5,407	\$ -				
Covered payroll	\$ 148,445	\$ 145,834	\$ 137,154	\$ 137,427	\$ 135,545	\$ 137,596				
Contributions as a percentage of covered payroll	28.02%	28.11%	29.89%	29.83%	26.12%	28.89%				

Notes to Schedule

Valuation date:

Actuarially determined contribution amounts are calculated as of the beginning of the fiscal year (July 1) for the current fiscal year. Actuarial valuations are performed every year.

Methods and assumptions used to determine contribution rates:

Actuarial cost method	Level Dollar Entry Age Normal
Amortization method	Level Payments (Closed)
Remaining amortization period	Remaining payments range from 1 to 25 years
Asset valuation method	5-year smoothed market
Inflation	3.2 percent
Salary increases	Rates vary by participant service
Investment rate of return	7.50 percent, net of pension plan investment and administrative expenses, including inflation
Retirement age	Rates vary by participant age
Mortality	RP-2014 Blue Collar tables with MP-2014. The RP-2014 Disabled Retiree table with MP-2014 is used for disabled members.

Maryland Transit Administration Pension Plan
 Actuarial Information to Include in the Financial Statements
 for the June 30, 2019 Measurement Date

Schedule of Differences between Projected and Actual Earnings on Pension Plan Investments

In conformity with paragraph 33b of Statement 68, the effects of differences between projected and actual earnings on pension plan investments are recognized in pension expense using a systematic and rational method over a closed five-year period, beginning in the current reporting period. The following table illustrates the application of this requirement.

Increase (Decrease) in Pension Expense Arising from the Recognition of Differences between Projected and Actual Earnings on Plan Investments											
Year	Differences between Projected and Actual Earnings on Pension Plan Investments	Recognition Period (Years)	2015	2016	2017	2018	2019	2020	2021	2022	2023
2015	\$ (3,938,427)	5	\$ (787,685)	(787,685)	(787,685)	(787,685)	(787,687)				
2016	(4,713,228)	5		\$ (942,646)	(942,646)	(942,646)	(942,646)	(942,644)			
2017	(7,649,509)	5			\$ (1,529,902)	(1,529,902)	(1,529,902)	(1,529,902)	(1,529,901)		
2018	2,036,482	5				\$ 407,296	407,296	407,296	407,296	407,298	
2019	(6,992,230)	5					\$ (1,398,446)	(1,398,446)	(1,398,446)	(1,398,446)	(1,398,446)
Net increase (decrease) in pension expense			\$ (787,685)	\$ (1,730,331)	\$ (3,260,233)	\$ (2,852,937)	\$ (4,251,385)	\$ (3,463,696)	\$ (2,521,051)	\$ (991,148)	\$ (1,398,446)

Deferred Outflows of Resources and Deferred Inflows of Resources Arising from Differences between Projected and Actual Earnings on Pension Plan Investments

Year	Investment Earnings Less than Projected (a)	Investment Earnings Greater Than Projected (b)	Amounts Recognized in Pension Expense Through June 30, 2019 (c)	Balances at June 30, 2019	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
2015	\$ -	\$ 3,938,427	\$ 3,938,427	\$ -	\$ -
2016	-	4,713,228	3,770,584	-	942,644
2017	-	7,649,509	4,589,706	-	3,059,803
2018	2,036,482	-	814,592	1,221,890	-
2019	-	6,992,230	1,398,446	-	5,593,784
				\$ 1,221,890	\$ 9,596,231

Maryland Transit Administration Pension Plan

Actuarial Information to Include in the Financial Statements
for the June 30, 2019 Measurement Date

Schedule of Differences between Expected and Actual Experience

In conformity with paragraph 33a of Statement 68, the effects of differences between expected and actual experience are recognized in pension expense, beginning in the current reporting period, using a systematic and rational method over a closed period equal to the average of the remaining service lives of all employees that are provided with pensions through the pension plan (active and inactive employees), determined as of the beginning of the measurement period. The following table illustrates the application of this requirement.

Increase (Decrease) in Pension Expense Arising from the Recognition of Differences between Expected and Actual Experience															
Year	Differences between Expected and Actual Experience	Recognition Period (Years)	Prior	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Thereafter
Prior	\$ -		\$ -	-	-	-	-	-	-	-	-	-	-	-	-
2014	-	7		\$ -	-	-	-	-	-	-	-	-	-	-	-
2015	(19,621,279)	7			\$ (2,803,040)	(2,803,040)	(2,803,040)	(2,803,040)	(2,803,040)	(2,803,040)	(2,803,039)				
2016	(15,023,996)	7				\$ (2,146,285)	(2,146,285)	(2,146,285)	(2,146,285)	(2,146,285)	(2,146,285)	(2,146,286)			
2017	(20,741,099)	7					\$ (2,963,014)	(2,963,014)	(2,963,014)	(2,963,014)	(2,963,014)	(2,963,014)	(2,963,015)		
2018	17,384,864	6						\$ 2,897,477	2,897,477	2,897,477	2,897,477	2,897,477	2,897,479		
2019	(8,527,580)	6							\$ (1,421,263)	(1,421,263)	(1,421,263)	(1,421,263)	(1,421,263)	(1,421,265)	-
Net increase (decrease) in pension expense	\$ -		\$ -	\$ -	\$ (2,803,040)	\$ (4,949,325)	\$ (7,912,339)	\$ (5,014,862)	\$ (6,436,125)	\$ (6,436,125)	\$ (6,436,124)	\$ (3,633,086)	\$ (1,486,799)	\$ (1,421,265)	\$ -

Deferred Outflows of Resources and Deferred Inflows of Resources Arising from Differences between Expected and Actual Experience

Year	Experience Losses (a)	Experience Gains (b)	Amounts Recognized in Pension Expense Through June 30, 2019 (c)	Balances at June 30, 2019	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
Prior	\$ -	\$ -	\$ -	\$ -	\$ -
2014	-	-	-	-	-
2015	-	19,621,279	14,015,200	-	5,606,079
2016	-	15,023,996	8,585,140	-	6,438,856
2017	-	20,741,099	8,889,042	-	11,852,057
2018	17,384,864	-	5,794,954	11,589,910	-
2019	-	8,527,580	1,421,263	-	7,106,317
				\$ 11,589,910	\$ 31,003,309

Maryland Transit Administration Pension Plan

Actuarial Information to Include in the Financial Statements
for the June 30, 2019 Measurement Date

Schedule of Changes of Assumptions

In conformity with paragraph 33a of Statement 68, the effects of changes of assumptions should be recognized in pension expense, beginning in the current reporting period, using a systematic and rational method over a closed period equal to the average of the remaining service lives of all employees that are provided with pensions through the pension plan (active and inactive employees), determined as of the beginning of the measurement period. The following table illustrates the application of this requirement.

Increase (Decrease) in Pension Expense Arising from the Effects of Changes of Assumptions															
Year	Changes of Assumptions	Recognition Period (Years)	Prior	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Thereafter
Prior	\$ -	-	\$ -	-	-	-	-	-	-	-	-	-	-	-	-
2014	-	7	\$ -	-	-	-	-	-	-	-	-	-	-	-	-
2015	53,480,106	7	-	-	\$ 7,640,015	7,640,015	7,640,015	7,640,015	7,640,015	7,640,015	7,640,016	-	-	-	-
2016	338,949,559	7	-	-	-	\$ 48,421,366	48,421,366	48,421,366	48,421,366	48,421,366	48,421,366	48,421,363	-	-	-
2017	(162,605,699)	7	-	-	-	-	\$ (23,229,386)	(23,229,386)	(23,229,386)	(23,229,386)	(23,229,386)	(23,229,386)	(23,229,386)	(23,229,383)	-
2018	(36,902,711)	6	-	-	-	-	-	\$ (6,150,452)	(6,150,452)	(6,150,452)	(6,150,452)	(6,150,452)	(6,150,451)	-	-
2019	(58,175,626)	6	-	-	-	-	-	-	\$ (9,695,938)	(9,695,938)	(9,695,938)	(9,695,938)	(9,695,938)	(9,695,938)	(9,695,936)
Net increase (decrease) in pension expense			\$ -	\$ -	\$ 7,640,015	\$ 56,061,381	\$ 32,831,995	\$ 26,681,543	\$ 16,985,605	\$ 16,985,605	\$ 16,985,606	\$ 9,345,587	\$ (39,075,772)	\$ (9,695,936)	\$ -

Deferred Outflows of Resources and Deferred Inflows of Resources Arising from Changes of Assumptions

Year	Increases in the Total Pension Liability (a)	Decreases in the Total Pension Liability (b)	Amounts Recognized in Pension Expense Through June 30, 2019 (c)	Balances at June 30, 2019	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
Prior	\$ -	\$ -	\$ -	\$ -	\$ -
2014	-	-	-	-	-
2015	53,480,106	-	38,200,075	15,280,031	-
2016	338,949,559	-	193,685,464	145,264,095	-
2017	-	162,605,699	69,688,158	-	92,917,541
2018	-	36,902,711	12,300,904	-	24,601,807
2019	-	58,175,626	9,695,938	-	48,479,688
				\$ 160,544,126	\$ 165,999,036

Maryland Transit Administration Pension Plan

Actuarial Information to Include in the Financial Statements for the June 30, 2019 Measurement Date

Projection of Contributions (Dollar amounts in thousands)

Year	Projected Covered Payroll			Projected Contributions			
	Payroll for Current Employees (a)	Payroll for Future Employees (b)	Total Employee Payroll ¹ (c) = (a) + (b)	Contributions from Current Employees (d)	Projected Total Employer Contribution ² (e)	Service Cost for Future Employees (f)	Total Contributions (g) = (d) + (e) - (f)
1	\$ 149,768	\$ -	\$ 149,768	\$ 2,995	\$ 51,997	\$ -	\$ 54,992
2	146,964	7,596	154,561	2,939	52,275	441	54,774
3	143,886	15,620	159,506	2,878	52,562	906	54,533
4	140,793	23,818	164,611	2,816	52,858	1,382	54,292
5	137,478	32,401	169,878	2,750	53,164	1,880	54,033
6	133,669	41,645	175,314	2,673	53,480	2,417	53,736
7	129,250	51,675	180,924	2,585	53,805	2,999	53,391
8	124,712	62,002	186,714	2,494	54,141	3,598	53,037
9	119,996	72,693	192,689	2,400	52,892	4,218	51,074
10	115,156	83,699	198,855	2,303	41,390	4,857	38,836

Note: Years subsequent to year 10 have been omitted from this table.

¹ Total covered payroll increases 3.20% per year.

² The employer is assumed to contribute the ADC annually to the trust

Maryland Transit Administration Pension Plan

Actuarial Information to Include in the Financial Statements for the June 30, 2019 Measurement Date

Projection of Pension Plan's Fiduciary Net Position (Dollar amounts in thousands)

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions ¹ (b)	Projected Benefit Payments (c)	Projected Administrative Expense ² (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Net Position (f) = (a) + (b) - (c) - (d) + (e)
1	\$ 322,304	\$ 54,992	\$ 44,589	\$ 2,095	\$ 26,606	\$ 357,219
2	357,219	54,774	47,412	2,322	29,319	391,577
3	391,577	54,533	50,239	2,545	31,985	425,311
4	425,311	54,292	53,058	2,765	34,600	458,381
5	458,381	54,033	56,092	2,979	37,153	490,495
6	490,495	53,736	59,241	3,188	39,621	521,423
7	521,423	53,391	62,451	3,389	41,989	550,963
8	550,963	53,037	65,764	3,581	44,239	578,894
9	578,894	51,074	69,072	3,763	46,293	603,426
10	603,426	38,836	72,498	3,922	47,648	613,490

Note: Years subsequent to year 10 have been omitted from this table.

¹ From Projection of Contributions table; Column (g)

² Pension plan administrative expense equal to 0.65% of Projected Beginning Fiduciary Net Position

Maryland Transit Administration Pension Plan

Actuarial Information to Include in the Financial Statements
for the June 30, 2019 Measurement Date

Actuarial Present Value of Projected Benefit Payments (Dollar amounts in thousands)

Year (a)	Projected Beginning Fiduciary Net Position ¹ (b)	Projected Benefit Payments (c)	"Funded" Portion of Benefit Payments (d)	"Unfunded" Portion of Benefit Payments (e)	Present Value of "Funded" Benefit Payments (f) = (d) / (1 + 8.15%) ^(a)	Present Value of "Unfunded" Benefit Payments (g) = (e) / (1 + 3.13%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) / (1 + 4.53%) ^(a)
1	\$ 322,304	\$ 44,589	\$ 44,589	\$ -	\$ 41,229	\$ -	\$ 42,658
2	357,219	47,412	47,412	-	40,536	-	43,393
3	391,577	50,239	50,239	-	39,716	-	43,989
4	425,311	53,058	53,058	-	38,783	-	44,444
5	458,381	56,092	56,092	-	37,912	-	44,950
6	490,495	59,241	59,241	-	37,022	-	45,417
7	521,423	62,451	62,451	-	36,087	-	45,804
8	550,963	65,764	65,764	-	35,138	-	46,144
9	578,894	69,072	69,072	-	34,124	-	46,365
10	603,426	72,498	72,498	-	33,118	-	46,557
25	114,774	107,434	107,434	-	15,152	-	35,504
26	15,310	108,436	-	108,436	-	48,659	34,283
27	-	109,373	-	109,373	-	47,590	33,081
98	-	-	-	-	-	-	-
99	-	-	-	-	-	-	-
Total					\$ 725,004	+ \$ 902,139	= \$ 1,627,143

Note: Years 11-24 and 28-97 have been omitted from this table

¹ From Projection of Pension Plan's Fiduciary Net Position table; Column (a)