Metropolitan Transportation Authority Defined Benefit Pension Plan

Financial Statements as of and for the
Years Ended December 31, 2018 and 2017,
Supplemental Schedules, and
Independent Auditors' Report

METROPOLITAN TRANSPORTATION AUTHORITY
DEFINED BENEFIT PENSION PLAN

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INDEPENDENT AUDITORS' REPORT

To the Board of Managers of Pensions
Metropolitan Transportation Authority Defined Benefit Pension Plan

Report on the Financial Statements

We have audited the accompanying statements of plan net position of the Metropolitan Transportation Authority Defined Benefit Pension Plan (the "Plan") as of December 31, 2018 and 2017, and the related statements of changes in plan net position for the years then ended, and the related notes to the financial statements, which collectively comprise the Plan's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Plan's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the plan net position as of December 31, 2018 and 2017, and the respective changes in plan net position for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Management's Discussion and Analysis on pages 3 through 9 and the Schedule of Changes in the Employers' Net Pension Liability and Related Ratios-Schedule I on page 51; Schedule of Employer Contributions-Schedule II on page 52-53; and Schedule of Investment Returns-Schedule III on page 54 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Deloitte & Touche LLP

February 24, 2020

This management's discussion and analysis of the Metropolitan Transportation Authority Defined Benefit Pension Plan (the "Plan") financial performance provides an overview of the Plan's financial activities for the years ended December 31, 2018 and 2017. It is meant to assist the reader in understanding the Plan's financial statements by providing an overall review of the financial activities during the two years and the effects of significant changes, as well as a comparison with the prior year's activity and results. This discussion and analysis may contain opinions, assumptions, or conclusions by the MTA's management that should not be considered a replacement for, and is intended to be read in conjunction with the Plan's financial statements which begin on page 10.

Overview of Basic Financial Statements

The following discussion and analysis is intended to serve as an introduction to the Plan's financial statements. The basic financial statements are:

- **The Statements of Plan Net Position —** presents the financial position of the Plan at fiscal year-end. It provides information about the nature and amounts of resources with present service capacity that the Plan presently controls (assets), consumption of net assets by the Plan that is applicable to a future reporting period (deferred outflow of resources), present obligations to sacrifice resources that the Plan has little or no discretion to avoid (liabilities), and acquisition of net assets by the Plan that is applicable to a future reporting period (deferred inflow of resources) with the difference between assets/deferred outflow of resources and liabilities/deferred inflow of resources being reported as net position. Investments are shown at fair value. All other assets and liabilities are determined on an accrual basis.

- **The Statements of Changes in Plan Net Position** - present the results of activities during the year. All changes affecting the assets and liabilities of the Plan are reflected on an accrual basis when the activity occurred regardless of the timing of the related cash flows. In that regard, changes in the fair values of investments are included in the year's activity as net appreciation (depreciation) in fair value of investments.

- **The Notes to Financial Statements** - provides additional information that is essential to a full understanding of the data provided in the financial statements. The notes present information about the Plan's accounting policies, significant account balances and activities, material risks, obligations, contingencies, and subsequent events, if any.

- **Required Supplementary Information** - as required by the Government Accounting Standards Board ("GASB") includes the Schedule of Changes in the Employer's Net Pension Liability and Related Ratios, Schedule of Employer Contributions, and Schedule of Investment returns.

The accompanying financial statements of the Plan are presented in conformity with accounting principles generally accepted in the United States of America as prescribed by the GASB.

CONDENSED FINANCIAL INFORMATION AND ANALYSIS

Plan Net Position
December 31, 2018, 2017 and 2016
(Dollars in thousands)

				Increase / Decrease			
				2018-2017		2017-2016	
	2018	2017	2016	$	%	$	%
Cash and investments	$ 4,028,634	$ 4,056,780	$ 3,433,122	$ (28,146)	(0.7)	$ 623,658	18.2
Receivables and other assets	4,590	3,778	1,753	812	21.5	2,025	115.5
Total assets	**$ 4,033,224**	**$ 4,060,558**	**$ 3,434,875**	**$ (27,334)**	**(0.7)**	**$ 625,683**	**18.2**
Due to broker for securities purchased	2,699	3,575	2,391	(876)	(24.5)	1,184	49.5
Other liabilities	6,045	5,449	12,513	596	10.9	(7,064)	(56.5)
Total liabilities	**8,744**	**9,024**	**14,904**	**(280)**	**(3.1)**	**(5,880)**	**(39.5)**
Plan net position restricted for pensions	**$ 4,024,480**	**$ 4,051,534**	**$ 3,419,971**	**$ (27,054)**	**(0.7)**	**$ 631,563**	**18.5**

December 31, 2018 versus December 31, 2017

Cash and investments at December 31, 2018 were $4,028.6 million representing a decrease of $28.1 million or 0.7% from 2017. This decrease is a result of weak investment activity in the fourth quarter of 2018 and plan contributions net of benefit payments and expenses during 2018.

Receivables and other assets net of liabilities at December 31, 2018 decreased by $1.1 million or 13.8% from 2017. The is due primarily to an increase in interest and dividend receivables in the amount of $0.8 million, offset by a decrease in other liabilities of $0.2.

The plan net position held in trust for pension benefits decreased by $27.0 million or 0.7% in 2018 as a result of the changes noted above.

December 31, 2017 versus December 31, 2016

Cash and investments at December 31, 2017 were $4,056.8 million representing an increase of $623.7 million or 18.2% from 2016. This increase is a result of investment activity and plan contributions net of benefit payments and expenses during 2017.

Receivables and other assets net of liabilities at December 31, 2017 decreased by $7.9 million or 60.1% from 2016. The is due primarily to an increase in interest and dividend receivables in the amount of $2.0 million, offset by a decrease in liabilities of $6.2 in millions related to the reversal of employer contributions due to the Long Island Railroad Additional Pension Plan, and other net liabilities of $0.4 million.

The plan net position held in trust for pension benefits increased by $631.6 million or 18.5% in 2017 as a result of the changes noted above.

Changes in Plan Net Position
For the Years Ended December 31, 2018, 2017 and 2016
(Dollars in thousands)

				Increase / Decrease			
				2018-2017		2017-2016	
	2018	**2017**	**2016**	**$**	**%**	**$**	**%**
Additions:							
Net investment (loss)/income	$ (150,422)	$ 516,153	$ 247,708	$ (666,575)	(129.1)	$ 268,445	108.4
Contributions	368,869	352,855	310,160	16,014	4.5	42,695	13.8
Total net additions	**218,447**	**869,008**	**557,868**	**(650,561)**	**(74.9)**	**311,140**	**55.8**
Deductions:							
Benefit payments	242,149	231,321	209,623	$ 10,828	4.7	$ 21,698	10.4
Tranfer to NYSLERs	200	1,622	-	(1,422)	(87.7)	1,622	100.0
Administrative expenses	3,152	4,502	3,051	(1,350)	(30.0)	1,451	47.6
Total deductions	**245,501**	**237,445**	**212,674**	**8,056**	**3.4**	**24,771**	**11.6**
Net increase in Plan net position	**(27,054)**	**631,563**	**345,194**	**(658,617)**	**(104.3)**	**286,369**	**83.0**
Plan net position restricted for pensions:							
Beginning of year	4,051,534	3,419,971	3,074,777	631,563	18.5	345,194	11.2
End of year	**$ 4,024,480**	**$ 4,051,534**	**$ 3,419,971**	**$ (27,054)**	**(0.7)**	**$ 631,563**	**18.5**

December 31, 2018 versus December 31, 2017

Net investment income decreased by $666.6 million in 2018 due to net investment loss of $150.4 million in 2018 versus net gains of $516.2 million experienced in 2017.

Contributions increased by $16.0 million or 4.5% in 2018 compared to 2017 as required by the Actuarial Determined Contributions (“ADC”) and member contributions from 2017 to 2018.

Benefit payments increased by $10.8 million or 4.7% over the prior year due to a continuing trend of increases in the number of retirees and cost-of-living adjustments provided to retirees and beneficiaries.

Administrative expenses decreased by $1.3 million, or 30.0% over 2017. The decrease is due primarily to non-recurring expenses charged in 2017 for various services provided to the Plan.

In 2017 and 2018, the Plan transferred $1.6 million and $0.2 million to New York State and Local Police and Fire Retirement System as required by New York State law due to transfers of membership.

December 31, 2017 versus December 31, 2016

Net investment income increased by $268.4 million in 2017 due to net investment gains of $516.2 million in 2017 versus net gains of $247.7 million experienced in 2016.

Contributions increased by $42.7 million or 13.8% in 2017 compared to 2016 as required by the Actuarial Determined Contributions (“ADC”) and member contributions from 2016 to 2017.

Benefit payments increased by $21.7 million or 10.4% over the prior year due to a continuing trend of increases in the number of retirees and cost-of-living adjustments provided to retirees and beneficiaries.

Administrative expenses increased by $1.5 million, or 47.6% over 2016. This increase is due primarily to expenses charged in 2017 for various services provided to the Plan.

Economic Factors

Market Overview and Outlook – 2018

Risk aversion and volatility marked the end of 2018, with geopolitical developments and concerns about slowing growth both contributing to the sell-off in global equity markets. U.S. stocks led the decline, contributing to the first calendar year with negative returns since 2008. Amid the equity underperformance, credit spreads widened, developed market yields fell, and the U.S. dollar weakened. In addition, the Federal Reserve ("Fed") hiked interest rates as expected, though trimmed its forecast for hikes in 2019.

Several factors contributed to heightened market volatility throughout 2018—most importantly, investor concerns brought on by rising trade tensions, particularly between the U.S. and China, the apparent shift to a moderately tighter monetary policy by central banks in major developed countries; and the potential for slower growth, especially in China and Europe. Most major indices closed in negative territory at the end fourth quarter. After a difficult start, emerging markets ("EM") held up better than their developed world counterparts in the fourth quarter, but still trailed for 2018 overall. The U.S. market was among the bottom-performing indices in the last quarter but led most major indices for the year, notwithstanding the S&P 500 Index's worst performance since the conclusion of the global financial crisis. As a result, global financial markets proved to be a challenging environment during the fourth quarter of 2018.

From a monetary policy perspective, the Fed raised rates 25bps as expected in December and signaled a slower pace of tightening in 2019 as it continued to unwind its extensive balance sheet. Investors divined a more dovish tone from the Fed's 2019 projections, but markets remained volatile through the end of the year. Globally, most developed-world central banks began moving towards modestly tighter stances, including the European Central Bank ("ECB"), which formally announced the end of its bond-buying program in December, concluding a roughly €2.6 trillion program. Across the channel, the Bank of England raised rates twice since the country's Brexit referendum in June 2016, but recently indicated it was prepared to pivot as necessary once the formal exit takes place in early 2019. The Bank of Japan has long been in its own monetary policy lane, remaining by far the most accommodative of the major global central banks.

Macro Themes

- Major indices post worst year since 2008 as trade, economic outlook and monetary policy weigh on investors
- Global growth modestly decelerates but remains positive
- Trade uncertainty

After reaching a new high in September, the S&P 500 lost nearly 14% during the fourth quarter to end the year, down more than 4.4%. The Dow Jones Industrial Index was off 11% for the quarter, as was Europe's Stoxx Limited Index, which ended the quarter 600 points lower. China's Shanghai Composite also lost 12% over the last quarter and nearly 25% for the year. The year's sharp drawdown seemed unlikely at the outset of 2018, given the relatively robust outlook at the time. The silver lining is that share prices now appear cheap from a forward price/earnings perspective compared to long-run averages and the outlook, although more challenging, is still largely positive for 2019.

Global growth slowed, rather than stalled, in the second half of 2018. The U.S. outperformed its peers in end-of-year data with annualized GDP up 3.4% in the third quarter. In contrast, growth in the Eurozone dropped to

0.2% in the third quarter (and 1.7% year-on-year). The German economy contracted due to disruption to the auto industry from tougher emissions rules, while the Italian economy stalled over its now-resolved budget standoff with the European Union. China's growth fell to 6.5% in the third quarter, although the government expects to beat its 6.5% growth target for the full year.

The extent of global growth deceleration is one unknown for markets; how central banks will react is another. The Fed softened its tone on potential hikes in 2019 but nevertheless, it remained too hawkish for some as it stuck to plans to unwind its balance sheet, contributing to year-end market volatility. In December, the ECB ended its bond-buying program but gave no guidance when negative interest rates might end. Loose monetary conditions also remained in force in the UK and Japan as policymakers balanced the competing needs of fragile growth, inflation and the desire to wean economies off support. Despite fears of heavy-handedness, the global approach remained measured.

The greatest concern for markets continues to be the tariff war. The pause in the dispute following the G20 meeting between the U.S. and China provided hope that a more permanent solution could be reached. However, stocks in China, as well as international companies with exposure to China, were affected by weakening sentiment and actual fallout. Apple became the latest U.S. corporation to point the finger at the trade war when it announced that fourth quarter revenues would be lower than expected. Declining consumer confidence in China and cheaper domestic alternatives were significant contributing factors.

The issue of confidence also hindered business. Uncertainty surrounding trade and political issues, such as further concern about a no-deal Brexit in the UK, held back capital investment, as Chief Executive Officers awaited greater clarity, thus creating a silver lining for equity investors. Supercharged earnings growth in 2018 resulted in record share buybacks as announced, and U.S. stock repurchases broke through the $1 trillion mark in December. Following the market retreat in the fourth quarter, more buybacks can be anticipated in the future. At the very least, the challenges of the fourth quarter present active investors with a more reasonable valuation and a very attractive starting point for 2019.

EM central banks have meanwhile faced their own travails, primarily centered around the security of central bank independence, particularly in Turkey and India. For now, the question in both countries seems to be largely settled in favor of independence—a positive for markets; but as is often the case in EM, that does not preclude the issue resurfacing down the road.

United States

Through mid-2018, U.S. capital markets enjoyed the longest equity bull market in their history. Valuations of stocks reached levels rarely-- and for some valuations measures, never-- seen before. However, in the fourth quarter of 2018, markets in the U.S. weakened tremendously with the S&P 500 ending the year down 13.5% with U.S. equities underperforming in 2018 compared to 2017.

Large Cap stocks were strongly negative, with the S&P 500 and Russell 1000 indices posting returns of (-4.4%) and (-4.84%), respectively. Small Cap and Mid Cap indices underperformed large cap. Small Cap, as measured by the Russell 2500 Index, returned (-10.0%). The Russell Mid Cap Index measured by the Russell 2000 Index lagged the Small Cap and posted a return loss of (-11.0%). Of note, growth oriented investments outperformed the value counterpart with the Russell 1000 Growth (-1.5%) outpacing the Russell 1000 Value (-8.3%).

Fixed income markets took the four rate hikes by the Fed in stride in 2018. Treasuries returned (+0.9%) for the year, with the assets strongest quarter coming in the first quarter of 2018. Municipal credit outperformed Treasuries for the year, with (+4.8%), posting positive returns for four straight quarters. Following strong results in 2017, high yield debt underperformed and ended its upward trend in 2018, returning (-2.1%).

International Developed

International equity markets posted very weak results in 2018 and lagged behind U.S. equity markets, returning (-9.4%) as measured by the Morgan Stanley Capital International ("MSCI") All Country World Index. In U.S. dollars, both Europe and Japan equities posted negative performance in 2018 with MSCI Europe returning (-14.9%) and MSCI Japan returning (-12.9%). Weak returns in Europe were driven by the global negative market performance in the last quarter of 2018. The Small Cap portion of international developed markets posted even weaker returns in 2018, (-17.9%).

Fixed income markets in Europe and Japan are largely centered on government bonds, with corporate and asset-backed issuance making up a fraction of the overall markets. Global Treasuries were negative in 2018, following a positive year in 2017.

Emerging Markets

Emerging markets posted very weak returns in 2018 with performance lower than both U.S. and international developed markets across equity and debt. The broad emerging markets index returned (-14.6%) for the year. Brazil was the best performing country, buoyed by President-elect Jair Bolsonaro's pick for chief economic advisor and his pledge to sell state owned companies. Within the EM group, Asia lagged, pulled down by declines in China, Korea and Taiwan. Healthcare and information technology were among the worst performing EM sectors, losing 15.4% and 15.1%, respectively.

The bond markets of emerging markets underperformed in 2018. Both hard currency and local currency bond posted very weak years in performance. Hard currency bonds, which are predominately issued in U.S. dollars, returned (-4.3%) in 2018. Local currency bonds, which are issued in the local currency, returned (-6.2%) for the year.

Commodities

Commodities posted negative results in 2018, with the broad Bloomberg Commodity Index down (-11.2%). Energy was the worst performing sub-sector, as oil prices were dampened by concerns of oversupply based on high inventories and stronger-than-expected production in Iran. Natural gas posted losses of -2.3% in a volatile quarter marked by low inventory levels and fluctuating weather forecasts. Natural gas consumption is projected to decrease slightly in the residential and commercial sectors, as expected milder weather will require less energy for space heating in the winter and air conditioning in the summer, largely based on temperature projections from the National Oceanic and Atmospheric Administration. On the other hand, precious metals strengthened towards the end of 2018, bolstered by the sell-off in equities and expectations for higher real interest rates.

Market Outlook

Global economic growth is likely to slow modestly in 2019, but the prevalent view is that investors' worst fears are likely exaggerated, as most of the world's economies will continue to expand rather than contract. Therefore, for the time being there is not – expectation of recession on the horizon.

There are many reasons for investors to be to be optimistic. U.S. corporate profit margins should remain high after the boost from 2018 tax cuts, which should result in earnings growth in the high single-digits or better. Furthermore, a more dovish stance from the Fed could signal a cyclical peak for the U.S. dollar, helping U.S. manufacturing and also providing some welcome relief for embattled EM companies facing higher dollar-denominated borrowing costs.

The Eurozone is expected to increase economic activities in the first half of 2019. Disruption to the German auto industry from new emissions standards, potential for increased fiscal stimulus across major economies in the bloc and the positive developments in Italy signaling a stronger unity in the European Union ("EU") can be potential catalysts for improving growth. Nevertheless, the intense uncertainty around Brexit will be a drag on the UK in the first quarter of 2019 and may extend its impact across Europe should Britain leave the EU without a deal on March 29th 2019.

An agreement between Organization Petroleum Exporting Countries ("OPEC") and its oil-producing allies to cut output can lead to greater price stability in 2019. But oil, and the broader commodity sector, remains a leading global growth concern.

Intense uncertainty on global trade remains the big issue gripping investors. The pause in the U.S.-China trade war could pave the way for a more comprehensive agreement. Nonetheless, significant obstacles remain, such as China's real desire to follow through on promises to open up its economy and end forced technology transfers.

Objectively, there can be little doubt there are multiple risks globally in this late-cycle phase. However, the outlook is far from bleak, and there is substantial consensus that 2019 could be a good year for portfolio reallocations, taking advantage of dislocated sectors, oversold opportunities and market outperformance.

Contact Information

This financial report is designed to provide a general overview of the Metropolitan Transportation Authority Defined Benefit Pension Plan's finances. Questions concerning any data provided in this report or requests for additional information should be directed to the Comptroller, Metropolitan Transportation Authority, 2 Broadway, 16th Floor, New York, NY 10004.

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METROPOLITAN TRANSPORTATION AUTHORITY
DEFINED BENEFIT PENSION PLAN

STATEMENTS OF PLAN NET POSITION
AS OF DECEMBER 31, 2018 AND 2017
(In tnousands)

	2018	2017
ASSETS:		
Cash	$ 13,224	$ 11,812
Investments at fair value (Notes 2 and 3):		
Investments measured at readily determined fair value	787,191	675,779
Investments measured at net asset value	3,228,219	3,369,189
Total investments	4,015,410	4,044,968
Receivables:		
Accrued interest and dividends	2,745	1,882
Other receivable	1,845	1,896
Total receivables	4,590	3,778
Total assets	4,033,224	4,060,558
LIABILITIES:		
Due to broker for securities purchased	2,699	3,575
Due to broker for investment fee	2,667	1,909
Due to broker for administrative expenses	267	306
Due to MTA for administrative expenses	2,818	2,515
Other liabilities	293	719
Total liabilities	8,744	9,024
PLAN NET POSITION RESTRICTED FOR PENSIONS	$ 4,024,480	$ 4,051,534

See notes to financial statements.

METROPOLITAN TRANSPORTATION AUTHORITY
DEFINED BENEFIT PENSION PLAN

STATEMENTS OF CHANGES IN PLAN NET POSITION
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017
(In thousands)

	2018	2017
ADDITIONS:		
Investment (loss) / income:		
Net realized and unrealized (losses) / gains	$ (169,255)	$ 527,182
Dividends	56,670	35,211
Interest	9,254	6,522
Total investment (loss) / income	(103,331)	568,915
Less:		
Investment expenses	(47,091)	(52,762)
Net investment income	(150,422)	516,153
Contributions:		
Employer:		
Metro-North Commuter Railroad Company	116,005	120,515
Long Island Rail Road Company	114,854	111,459
Metropolitan Transportation Authority Headquarters	42,967	33,276
MTA Bus Company	57,264	50,479
Staten Island Rapid Transit Operating Authority	7,877	6,132
Employee	29,902	30,994
Total contributions	368,869	352,855
Total additions	218,447	869,008
DEDUCTIONS:		
Benefits paid to participants	242,149	231,321
Transfer of MTA Police Employer & Employee Contributions to NYSLERs	200	1,622
Administrative expenses	3,152	4,502
Total deductions	245,501	237,445
NET (DECREASE) / INCREASE IN PLAN NET POSITION	(27,054)	631,563
PLAN NET POSITION RESTRICTED FOR PENSIONS		
Beginning of year	4,051,534	3,419,971
End of year	$ 4,024,480	$ 4,051,534

See notes to financial statements.

1. PLAN DESCRIPTION

The following brief description of the Metropolitan Transportation Authority (the “Authority”) Defined Benefit Pension Plan (the “Plan”) is provided for general information purposes only. Participants should refer to the Plan document for more complete information.

General — The Plan represents a cost-sharing employer defined benefit pension plan sponsored by the Authority and administered by the Board of Managers of Pensions, covering:

(a) management employees of the Long Island Rail Road Company (“MTA Long Island Rail Road”) hired after January 1, 1988 not governed by collective bargaining agreements;

(b) management employees of the Metro-North Commuter Railroad Company (“MTA Metro-North Railroad”) not governed by collective bargaining agreements;

(c) represented MTA Long Island Rail Road employees hired after January 1, 1988, covered by collective bargaining agreements which provide for participation in the plan effective January 1, 2004;

(d) certain represented MTA Metro-North Railroad employees covered by collective bargaining agreements which provide for participation in the plan effective on or after January 1, 2004;

(e) represented and non-represented MTA Long Island Rail Road employees hired prior to January 1, 1988;

(f) Metropolitan Suburban Bus Authority (“MTA Long Island Bus”) provided public service in Nassau and Queens Counties. The Authority’s Lease and Operating Agreement with Nassau County, dated January 15, 1973, as amended, was terminated effective December 31, 2011. As of January 1, 2012, the MTA Long Island Bus is no longer a member of the MTA Group. Represented and management Metropolitan Suburban Bus Authority (“MTA Long Island Bus”) employees hired prior to January 24, 1983 and any MTA Long Island Bus person employed by the MSBA Employees’ Pension Trust prior to July 29, 1998 under the MSBA Employees’ Pension Plan remained vested employees in the plan;

(g) represented and management employees of the Staten Island Rapid Transit Operating Authority (“MTA Staten Island Railway”) effective January 1st, 2005;

(h) certain represented and management employees of MTA Bus Company (“MTA Bus”), including represented and non-represented employees who were formerly employed by Liberty Lines Express, Inc., New York Bus Tours, Inc., Command Bus Company, Green Bus Lines Inc., Jamaica Buses Inc., Triboro Coach Corporation and represented and most non-represented employees formerly employed by Queens Surface Corporation; and

(i) participants in the MTA Defined Benefit Pension Plan 20 Year Police Retirement program (“MTA Police”).

The Plan contains multiple and distinct benefit structures for MTA Metro-North Railroad and MTA Long Island Rail Road management employees, for MTA Metro-North Railroad and MTA Long Island

Rail Road represented employees, MTA Police, MTA Long Island Bus employees and MTA Staten Island Railway employees. In addition, there are multiple but distinct benefit structures for the employees of MTA Bus which are based on the plans covering those employees prior to their becoming MTA Bus employees. MTA Bus non-represented employees and employees represented by the UTLO are covered by separate programs. Assets and liabilities are pooled and a single cash contribution amount and annual pension cost is determined. The Plan is designed to satisfy the applicable requirements for governmental plans under Section 401(a) and 501(b) of the Internal Revenue Code. Accordingly, the Plan is tax-exempt and is not subject to the provisions of the Employee Retirement Income Security Act ("ERISA") of 1974.

Membership of the Plan consisted of the following as of January 1, 2018 and 2017, respectively, the date of the latest actuarial valuations:

	2018	**2017**
Active Plan Members	18,631	18,048
Retirees and beneficiaries receiving benefits	11,132	10,861
Vested formerly active members not yet receiving benefits	1,472	1,433
Total	31,235	30,342

Funding for the Plan is provided by the Authority, MTA Metro-North Railroad, MTA Long Island Rail Road, MTA Bus and MTA Staten Island Railway which are public benefit corporations that receive a significant portion of their operating and capital financing requirements from New York City, New York State, federal and regional governmental units and from the sale of bonds to the public. Certain funding is made on a discretionary basis. The continuance of funding for the Plan has been, and will continue to be, dependent upon the receipt of adequate funds.

Plan Administration – The Defined Benefit Plan is administered by the Board of Managers of Pensions which comprised of:

(a) the persons holding the following positions:
   (j) the Chairman of the MTA;
   (ii) the MTA Chief Financial Officer;
   (iii) the MTA Director of Labor Relations; and
   (iv) the agency head of each participating Employer.

(b) Designation of Others – Any member of the Board of Managers, serving as such by virtue of holding a position described in (a) of this section, may, by written authorization filed with the Secretary who shall notify the other members of the Board of Managers, designate another individual, not then a member of the Board of Managers, to serve in that member's stead, in accordance with procedures established with the approval of the Executive Director. Any such authorization may be revoked by the designating member at any time in writing filed in the same manner.

(c) The Board of Managers shall be the agent for the service of legal process with respect to the Plan. No bond or other security is required in any jurisdiction of the Board of Managers or any member thereof except as required by law.

Pension Benefits — Retirement benefits are paid from the Plan to covered MTA Metro-North Railroad, MTA Staten Island Railway and post —1987 MTA Long Island Rail Road employees as service retirement allowances or early retirement allowances. A participant is eligible for a service retirement allowance upon termination if the participant satisfied both age and service requirement. A participant is eligible for an early retirement allowance upon termination if the participant has attained age 55 and completed at least 10 years of credited service. Terminated participants with 5 or more years of credited service who are eligible for a deferred vested benefit are not eligible to receive a service retirement allowance or early retirement allowance. Deferred vested benefits are payable on an unreduced basis on the first day of the month following the participant sixty-second birthday. Effective in 2007, members and certain former members who become (or became) employed by another MTA agency which does not participate in the Plan continue to accrue service credit based on such other employment. Upon retirement, the member's vested retirement benefit from the Plan will be calculated on the final average salary of the subsequent MTA agency, if higher. Moreover, the Plan benefit will be reduced by the benefit, if any, payable by the other plan based on such MTA agency employment. Such member's disability and ordinary death benefit will be determined in the same way.

Retirement benefits are paid from the Plan under the MTA 20-Year Police Retirement Program. A participant is eligible for service retirement at the earlier of completing 20 years of credited Police service or attainment of age 62. Terminated participants with five years of credited police service, who are not eligible for retirement, are eligible for a deferred benefit. Deferred vested benefits are payable on the first of the month following the participant's attainment of age 55.

Retirement benefits paid from the Plan to covered represented MTA Bus employees include service retirement allowances or early retirement allowances. Under the programs covering all represented employees at Baisley Park, Eastchester, La Guardia, Spring Creek, and Yonkers Depots and the represented employees at College Point Depot, JFK, Far Rockaway a participant is eligible for a service retirement allowance upon termination if the participant has attained age 65 and completed at least 5 years of credited service or if the participant has attained age 57 and completed at least 20 years of credited service. A participant hired prior to June 2009 from Baisley Park, College Point, and La Guardia Depots is eligible for an early retirement allowance if the participant has attained age 55 and completed 20 years of credited service. Terminated participants with 5 or more years of credited service who are not eligible to receive a service retirement allowance or early retirement allowance are eligible for a deferred vested benefit. Deferred vested benefits are payable on an unreduced basis on or after the participant attains age 65.

The MTA Bus retirement programs covering TWU, ATU and TSO represented employees are fixed dollar plans, i.e., the benefits are a product of credited service and a specific dollar amount.

The retirement benefits for certain former employees of the Alliance Companies are based on a participant's service and final average salary. A normal retirement benefit is payable when the participant attains age 62 with 5 years of service. An early retirement benefit is payable when the participant attains age 55 with 15 years of service. The retirement benefit is payable as a single life annuity or, for married participants, as an unreduced 75% joint and survivor annuity.

MTA Bus non-represented employees and employees represented by the UTLO as of January 1, 2017 will earn benefits under a new set of programs. For service prior to 2017, a component calculated by a flat monthly dollar rate multiplied by years of credited service will be added to a final average salary (FAS) component, based on the platforms provided to similarly situated MaBSTOA Pension Plan members. For service on or after January 1, 2017, the final average salary component platform will be based on date of hire, years of credited service and whether the participant holds an operating or non-operating title. Certain former Liberty Lines employees assigned to the former Liberty Lines bus routes also are eligible for a supplemental plan benefit of 0.75% of final average salary per year of Plan service. TWU Local 100 has been certified as the collective bargaining representative for certain titles previously not represented at MTA Bus. Affected employees will participate in these programs, as set forth in the relevant collective bargaining agreement.

An MTA Bus non-represented or UTLO operating employee hired prior to April 1, 2012 participates in a Tier 4 25/55 operating retirement platform. A Tier 4 25/55 operating retirement platform participant with 25 years of Allowable Service receives upon retirement at age 55 a flat rate benefit equal to $1,380.00 ($115 x 12) for each year of service prior to January 1, 2017, plus a FAS benefit equal to 2% multiplied by FAS multiplied by service accrued after January 1, 2017, up to 30 years of total service, plus 1.5% multiplied by FAS multiplied by service accrued after January 1, 2017 in excess of 30 years of total service.

An MTA Bus non-represented non-operating employee hired prior to April 1, 2012 participates in a Tier 4 57/5 non-operating retirement platform. A Tier 4 57/5 non-operating retirement platform participant receives upon retirement at age 57 a flat rate benefit equal to $1,380.00 ($115 x 12) for each year of service prior to January 1, 2017, plus a FAS benefit equal to, for those with less than 20 years of total service, 1 2/3% multiplied by FAS multiplied by total service accrued after January 1, 2017, or, for those with 20 or more years of total service, 2% multiplied by FAS multiplied by total service accrued after January 1, 2017, up to 30 years of total service, plus 1.5% multiplied by FAS multiplied by total service accrued after January 1, 2017 in excess of 30 years of total service.

An MTA Bus non-represented or UTLO operating employee hired on or after April 1, 2012 participates in a Tier 6 25/55 operating retirement platform. A Tier 6 25/55 operating retirement platform participant with 25 years of Allowable Service receives upon retirement at age 55 a flat rate benefit equal to $1,380.00 ($115 x 12) for each year of service prior to January 1, 2017, plus a FAS benefit equal to 2% multiplied by FAS multiplied by service accrued after January 1, 2017 up to 30 years of total service, plus 1.5% multiplied by FAS multiplied by service accrued after January 1, 2017 in excess of 30 years of total service. The flat rate benefit is vested after the completion of five years of total service and the FAS benefit is vested after the completion of ten years of total service.

An MTA Bus non-represented non-operating employee hired on or after April 1, 2012 participates in a Tier 6 63/10 non-operating retirement platform. A Tier 6 63/10 non-operating retirement platform participant receives upon retirement at age 63 a flat rate benefit equal to $1,380.00 ($115 x 12) for each year of service prior January 1, 2017, plus a FAS benefit equal to, for those with less than 20 years of total service, 1.67% multiplied by FAS multiplied by total service accrued after January 1, 2017, or, for those with 20 or more years of total service, 1.75% multiplied by FAS multiplied by total service accrued after January 1, 2017, up to 20 years of such service, plus 2% multiplied by FAS multiplied by total service accrued after January 1, 2017 in excess of 20 years of total service. The flat rate benefit is vested after the completion of five years of total service and the FAS benefit is vested after the completion of ten years of total service.

Reduced early retirement benefits are payable under all platforms. The Tier 6 definition of wages includes an overtime ceiling which limits overtime compensation for pension purposes to no more than $16,048 for 2017 and $16,406 for 2018, indexed annually thereafter. Any overtime compensation earned in excess of the overtime ceiling is excluded from the final average salary calculation. The Tier 6 definition of wages also excludes wages in excess of the annual salary paid to the New York State Governor, lump-sum payments for deferred compensation, sick leave, accumulated vacation or other credits for time not worked.

TWU, ATU and TSO members who retire after November 16, 2016, and UTLO members and non-represented employees who retire after January 1, 2017 will have their pension benefit increased by a Cost of Living Adjustment (COLA). The COLA is an annual adjustment to the retirement benefit based on the Consumer Price Index (CPI). The following retirees are eligible to receive a COLA: disability retirees, regardless of age, who have been retired for at least 5 years; retirees who are at least age 62 and have been retired for at least 5 years; and retirees who are at least age 55 and have been retired for at least 10 years. Surviving spouses receiving a joint-and-survivor option benefit are eligible to receive 50% of the monthly COLA that would have been paid to the retiree. For TWU, ATU and TSO members, the COLA calculation is based on the first $18,000 of the retiree's normal retirement benefit. For UTLO members and non-represented employees, the COLA calculation is based on the first $18,000 of the retiree's final average salary benefit component. The COLA amount may not be less than 1% nor more than 3% in any year. Once COLA payments begin, they continue automatically and increase each September.

Certain MTA Bus employees represented by TWU Local 100 were granted pension service credit for periods of employment at Liberty Lines Express, Inc. prior to January 3, 2005, with the increase in the Plan benefit offset by the benefit accrued under the TWU-Westchester Private Bus Lines Pension Plan.

Pre-1988 MTA Long Island Rail Road participants are eligible for a service retirement allowance upon termination if the participants have either: (a) attained age 65 and completed at least 5 years of credited service, or if an employee on January 1, 1988 completed at least 10 years of credited service, or (b) attained age 50 and has completed at least 20 years of credited service. Terminated participants who were not employees on January 1, 1988 with 5 or more years of credited service are eligible for a deferred vested benefit. Pension benefits payable to age 65, where eligible, are calculated as 2% of the employee's applicable final average earnings for each year of qualifying service up to 25 years plus 1.5% of applicable final average earning of each year of qualifying service in excess of 25 years. For pension benefits payable at and after age 65 regardless of whether benefits commenced before or after the employee attained age 65, benefits are calculated in the same manner as pension benefits payable prior to age 65 except that the amount so determined is reduced by a percentage of the employee's annuity (not including supplemental annuity) value at age 65 under the Federal Railroad Retirement Act.

The reduction of pension benefits for amounts payable under the Federal Railroad Retirement Act is 50%.

Death and Disability Benefits — In addition to service retirement benefits, participants of the Plan are eligible to receive disability retirement allowances and death benefits. Participants who become disabled may be eligible to receive disability retirement allowances after 10 years of covered MTA Bus service; 10 years of credited service for covered MTA Metro-North Railroad and MTA Long Island Rail Road management and represented employees, covered MTA Staten Island Railway employees and covered MTA police participants.

The disability retirement allowance for covered MTA Metro-North Railroad and MTA Long Island Rail Road management and represented covered MTA Staten Island Railway employees is calculated based on the participant's credited service and final average salary ("FAS") but not less than ⅓ of FAS. Under the MTA 20 Year Police Retirement Program, a disabled participant may be eligible for one of three forms of disability retirement: (a) ordinary disability which is payable if a participant has 10 years of credited Police service and is calculated based on the participant's credited Police service and FAS but not less than ⅓ of FAS; (b) performance of duty, which is payable if a participant is disabled in the performance of duty and is ½ of FAS, and (c) accidental disability, which is payable if a participant is disabled as the result of an on-the-job accidental injury and is ¾ of FAS subject to an offset of Workers' Compensation benefits. Pursuant to the MTA Bus programs, the disability benefit is the same as the service retirement benefit.

Pre-1988 MTA Long Island Rail Road participants who become disabled after accumulating 10 years of credited service and who meet the requirements as described in the Plan may be eligible to receive a disability benefit. Disability pension benefits are calculated based on the participant's qualified service and a percentage of final average compensation reduced by the full amount of the disability benefit under the Federal Railroad Retirement Act.

Survivorship benefits for pre-1988 MTA Long Island Rail Road participants are paid to the spouse when a survivorship option is elected or when an active participant has not divested their spouse of benefits. The survivorship benefit is payable at the time of death or when the vested participant would have attained an eligible age. The amount payable is in the form of an annuity. A lump sum death benefit no greater than $5,000 is payable upon death on behalf of a non-vested participant or vested participant whose pension rights were waived.

Death benefits are paid to the participant's beneficiary in the event of the death of a covered MTA Metro-North Railroad, post-1987 MTA Long Island Rail Road or MTA Staten Island Railway employee after completion of one year of credited service. The death benefit payable is calculated based on a multiple of a participant's salary based on years of credited service up to three years and is reduced beginning at age sixty-one. There is also a post-retirement death benefit which, in the 1st year of retirement, is equal to 50% of the pre-retirement death benefit amount, 25% the 2nd year and 10% of the death benefit payable at age 60 for the 3rd and later years. For the Police 20 Year Retirement Program, the death benefit is payable after ninety days of credited MTA Police service, and is equal to three times their salary. For non-Police groups, this death benefit is payable in a lump sum distribution while for Police, the member or the beneficiary can elect to have it paid as an annuity. The MTA Police do not have a post retirement benefit.

In the MSBA Employees' Pension Plan, there are special spousal benefits payable upon the death of a participant who is eligible for an early retirement benefit, or a normal service retirement benefit, or who is a vested participant or vested former participant. To be eligible, the spouse and participant must have been married at least one year at the time of death. Where the participant was eligible for an early service retirement benefit or was a vested participant or former participant, the benefit is a pension equal to 40% of the benefit payable to the participant as if the participant retired on the date of death. Where the participant was eligible for a normal service retirement benefit, the eligible spouse can elect either the benefit payable as a pension, as described in the prior sentence, or a lump sum payment based on an actuarially determined pension reserve. If there is no eligible spouse for this pension reserve benefit, a benefit is payable to the participant's beneficiary or estate.

Moreover, an accidental death benefit is payable for the death of a participant who is a covered MTA Metro-North Railroad or post-1987 MTA Long Island Rail Road employee, a covered MTA Staten Island Railway employee or a covered MTA Police member and dies as the result of an on-the-job accidental injury. This death benefit is paid as a pension equal to 50% of the participant's salary and is payable to the spouse for life, or, if none, to children until age 18 (or 23, if a student), or if none, to a dependent parent.

For MTA Bus employees, there is varied death benefit coverage under the Plan. For all represented and non-represented MTA Bus employees at Eastchester and Yonkers Depots and represented MTA Bus employees at Baisley Park, College Point, Far Rockaway, JFK, La Guardia and Spring Creek Depots, if a participant dies prior to being eligible for a retirement benefit, the participant's beneficiary may elect to receive a refund of the participant's contributions plus interest.

Moreover, the spouses of the above employees who are vested are entitled to a presumed retirement survivor annuity which is based on a 50% Joint and Survivor annuity. The date as of which such annuity is determined and on which it commences varies among the different programs depending on whether the participants are eligible for retirement and for payment of retirement benefits.

In addition, the spouse of a non-represented MTA Bus employee at Spring Creek, JFK, La Guardia, Baisley Park and Far Rockaway, if such employee is age 55 and has 15 years of service and is a terminated member with a vested benefit which is not yet payable, may elect the presumed retirement survivor annuity or 1/2 the participant's accrued benefit paid monthly and terminating on the 60th payment or the spouse's death. The spouse of a non-represented MTA Bus employee at Yonkers Depot may also receive a pre-retirement survivor annuity from the supplemental plan. If there is no such spouse, the actuarial equivalent of such annuity is payable.

The dependent children of MTA Bus TWU employees of College Point, Baisley Park, and La Guardia hired prior to June 9, 2009 are also entitled to an annuity based on the spouse's pre-retirement survivor annuity (1/2 of the spouse's annuity is payable to each child, but no more than 100% of the spouse's annuity is payable). In addition, the dependent children of retirees who were MTA Bus employees at these Depots are entitled to an annuity based on the presumed retirement survivor's annuity (25% of the spouse's annuity; but no more than 50% of the spouse's annuity is payable).

Retirement benefits establishment and changes for represented employees are collectively bargained and must be ratified by the respective union and the MTA Board. For non-represented employees, retirement benefit adopted and modifications thereto, are presented to the MTA Board and must be accepted and approved by the MTA Board.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Accounting — The Plan's financial statements are prepared on the accrual basis of accounting under which deductions are recorded when the liability is incurred and additions are recognized in the accounting period in which they are earned. Benefits and refunds are recognized when due and payable in accordance with the terms of the Plan. Contributions from members are recorded when the employer makes payroll deductions from plan members. Employer contributions are recognized when due in accordance with the terms of the Plan. Additions to the Plan consist of contributions (member and employer) and net investment income. Investment purchases and sales are recorded as of trade date.

The accounting and reporting policies of the Plan conform to accounting principles generally accepted in the United States of America (GAAP).

New Accounting Standards Adopted – The Plan adopted GASB Statement No. *85 Omnibus 2017.* This Statement addresses a variety of topics including issues related to blending component units, goodwill, fair value measurement and application, and postemployment benefits (pensions and other postemployment benefits ("OPEB"). There was no material impact on the Plan's financial statements as a result of the implementation of GASB Statement No. 85.

Recent Accounting Pronouncements — Not yet adopted but currently being evaluated

GASB Statement No.	GASB Accounting Standard	MTA Pension Plan Required Year of Adoption
84	*Fiduciary Activities*	2019

Use of Estimates — The preparation of the Plan's financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates. Estimates include fair market value of investments, the annual required contribution and the unfunded actuarial accrued liability.

Benefits — Benefits are recorded when paid.

Contributions - As a condition of participation in the MTA Defined Benefit Pension Plan ("MTADBPP" or the "Plan"), employers and employees are required to contribute to the Plan. The amount of the employer contributions is determined by the Plan actuaries. Employee contribution rates for represented employees are determined by collective bargaining. Employee contribution rates for non-represented employees are set forth in the Plan document as adopted by the MTA Board. If an employee terminates employment with less than 10 (ten) years of credited service in the Plan, the employee may request a refund of his employee contributions with interest. Upon receipt of this refund of contributions, the employee has no claim on any future benefit from the Plan. Employees with more than 10 years of credited service, except for a small group of MTA Bus participants, cannot withdraw their contributions.

Members of the MTA Police Program who have transferred pursuant to Retirement and Social Security Law Section 343 and have not been employed in the MTA Police Program for 15 years may, upon termination of employment, withdraw member contributions. The withdrawal of such transferred police service member contributions shall not terminate membership and rights in the MTA Police Program attributable to Credited Police Service.

Income - Dividend and interest income are recorded when earned.

Securities - Purchases and sales of securities are recorded on a trade-date basis.

Asset Transfers — No assets were transferred to the MTA Defined Benefit Pension Plan for the years 2018 and 2017 respectively.

Administrative Expenses — Administrative expenses of the Plan are paid for by the Plan.

3. CASH AND INVESTMENTS

Investment Policy – The Plan's policy statement is issued for the guidance of fiduciaries, including the members of the Board and investment managers, in the course of investing the assets of the Trust. The investments of the Trust will be made for the exclusive benefit of the Plan participants and their beneficiaries. Policy guidelines may be amended by the Board upon consideration of the advice and recommendations of investment professionals.

In order to have a reasonable probability of achieving the target return at an acceptable risk level, the Board has adopted the asset allocation policy outlined below. The actual asset allocation will be reviewed on, at least, a quarterly basis and will be readjusted when an asset class weighting is outside its target range. The following was the MTA Defined Benefit Pension Plan Board adopted asset allocation policy as at December 31, 2018.

Asset Class	Target Allocation (%)	Target Range (%)	Policy Benchark
Equities	**29.0**	**24-34**	
Domestic Large Cap	10.0	5-15	S&P 500
Domestic Small Cap	5.5	2-10	Russell 2000
International Developed Markets Equities	10.0	5-15	MSCI EAFE
Emerging Markets Equities	3.5	2-6	MSCI Emerging Markets
Fixed Income	**15.0**	**9-21**	Manager Specific
Global Asset Allocation*	**20.0**	**15-33**	50% World Equity/ 50% Citigroup WGBI unhedged
Opportunistic Investments	**6.0**	**0-15**	Manager Specific
Absolute Return	**15.0**	**10-22**	Manager Specific
Real Assets	**5.0**	**0-10**	Manager Specific
Real Estate	**3.0**	**0-10**	Manager Specific
Private Equity	**7.0**	**0-10**	Venture Economics
Total	**100.0**		

* The Global Asset Allocation managers will invest across numerous liquid asset classes including: stocks, bonds, commodities, TIPS and REITs.

Investment Objective — The investment objective of the Plan is to achieve the actuarial return target with an appropriate risk position.

Investment Guidelines — The Board of Pension Managers executes investment management agreements with professional investment management firms to manage the assets of the Plan. The fund managers must adhere to guidelines that have been established to limit exposure to risk.

The overall capital structure targets and permissible ranges for eligible asset classes of the Trust are detailed within the Investment Policy Statement. Full discretion, within the parameters of the guidelines described herein and in any individual investment policy associated with that allocation, is granted to the investment managers regarding the asset allocation, the selection of securities, and the timing of transactions. It is anticipated that the majority of investment managers will be funded through commingled funds, however, in some cases (likely equity and fixed income mandates) separate account vehicles may be utilized. For separate accounts, individual manager guidelines and/or exemptions are specified in each approved investment management agreement ("IMA"). Should there be conflicts, the individual manager guidelines set forth in the IMA supersede the general guidelines in the Investment Policy Statement. For commingled funds, investment guidelines and/or exemptions are specified in such vehicle's offering documents. Should there be conflicts, the individual vehicle's investment guidelines supersede the general guidelines in the Investment Policy Statement.

Individual investment manager benchmarks and performance requirements are specified within the Investment Policy Statement. Performance of the Trust will be evaluated on a regular basis. Evaluation will include the degree to which performance results meet the goals and objectives as herewith set forth. Toward that end, the following standards will be used in evaluating investment performance:

1. The compliance of each investment manager with the guidelines as expressed herein, and
2. The extent to which the total rate of return performance of the Trust achieves or exceeds the targeted goals.

Fixed Income Investment Managers

- Domestic fixed income investments are permitted, subject to the guidelines reflected in Investment Policy Statement. Yankee bonds, which are dollar denominated foreign securities, may be held by each domestic manager in proportions which each manager shall deem appropriate.

- International fixed income securities are permitted, subject to the guidelines reflected in Investment Policy Statement. Generally defined, the Citigroup World Government Bond Index represents the opportunity set for international developed markets. The J.P. Morgan Emerging Markets Bond Index-Global represents the opportunity set for international emerging markets denominated in USD. The J.P. Morgan GBI-EM Global Diversified Index represents the opportunity set for international emerging markets denominated in local currency. These index references are guidelines and do not prohibit investment in securities outside those indexes.

- Investment managers are responsible for making an independent analysis of the credit worthiness of securities and their suitability as investments regardless of the classifications provided by rating agencies.

- The average duration (interest rate sensitivity) of an actively managed fixed income portfolio shall range within two years of the benchmark's duration.

- For domestic fixed income portfolios, individual manager account for the securities of an individual issuer, excepting the U.S. government and U.S. government agencies, shall not constitute more than 5% at market at any time.

- For international bond portfolios, individual manager account for the securities of any non-governmental issuer shall not constitute more than 5% at market at any time.

Equity Investment Managers

- Domestic equity investments are permitted, subject to the guidelines. American Depository Receipts (ADRs), which are dollar denominated foreign securities traded on the domestic U.S. stock exchanges (e.g., Reuters, Nestle, Sony) may be held by each domestic stock manager in proportions which each manager shall deem appropriate.

- International equities are permitted, subject to the guidelines. Generally defined, the Morgan Stanley EAFE (Europe, Australasia and the Far East) Index represents the opportunity set for international developed markets. The Morgan Stanley Emerging Markets Free Index represents the opportunity set for international emerging markets. These index references are guidelines and do not prohibit investment in securities outside those indexes.

- The equity specialists may vary equity commitment from 90% to 100% of assets under management.

- Individual manager account may hold no more than 8% at market or 1.5x the manager's benchmark weight (whichever is greater) of any single company's stock.

Overlay Manager(s).

- For a variety of reasons, the investment program may carry large amounts of cash throughout the year. In order to achieve the actuarial assumed returns on the total investment program, the Board may retain a futures overlay manager. The overlay manager shall use exchange traded futures contracts to expose the cash to the long-term target asset allocation.

- In addition, the overlay manager may be utilized for the following:
  a) Expose un-invested assets of domestic and international equity investment managers to their respective equity benchmarks through the use of futures contracts,
  b) Assist the Board in rebalancing, transitions, and/or gaining exposure to approved asset classes,
  c) Provide the market (or "beta") exposures in a portable alpha program,
  d) The overlay manager shall ensure that all futures positions are fully collateralized and the manager is prohibited from leveraging any portion of the portfolio.

Alternative Investments Managers

Alternative investments are broadly categorized into the following categories:

- Opportunistic
- Real assets
- Real estate
- Absolute return
- Private equity

Common features of alternative investments are limited liquidity, the use of derivatives, leverage and shorting, lower regulatory oversight, limited transparency, and high fees. Compensating for these risks, these investments offer the potential of diversification and/or higher rates of return over time

Derivatives Policy

Where appropriate, investment managers may use derivative securities for the following reasons:

- Hedging. To the extent that the portfolio is exposed to clearly defined risks and there are derivative contracts that can be used to reduce those risks, the investment managers are permitted to use such derivatives for hedging purposes, including cross-hedging of currency exposures.

- Creation of Market Exposures. Investment managers are permitted to use derivatives to replicate the risk/return profile of an asset or asset class provided that the guidelines for the investment manager allow for such exposures to be created with the underlying assets themselves.

- Management of Country and Asset Allocation Exposure. Investment managers charged with tactically changing the exposure of their portfolio to different countries and/or asset classes are permitted to use derivative contracts for these purposes.

- Additional uses of derivatives shall be approved by the Board or set forth in the individual investment guidelines or the offering documents prior to implementation and shall be restricted to those specific investment managers.

Ineligible Investments (Separately Managed Accounts)

Unless specifically approved by the Board or set forth in the individual investment guidelines, certain securities, strategies and investments are ineligible for inclusion within separately managed accounts. Among these are:

- Privately-placed or other non-marketable debt, except securities issued under Rule 144a,
- Lettered, legend or other so-called restricted stock,
- Commodities
- Short sales, and,
- Direct investments in private placements, real estate, oil and gas and venture capital, or funds comprised thereof.

Exceptions:

The Board of Managers, in recognition of the benefits of commingled funds as investment vehicles (i.e., the ability to diversify more extensively than in a small, direct investment account and the lower costs which can be associated with these funds) may, from time to time, allow investment in such funds. The Board recognizes that it cannot give specific policy directives to a fund; therefore, the Board, with the assistance of the investment advisor, will assess and monitor the investments of any funds used by the Plan to ascertain whether they are appropriate.

Investment Valuation and Income Recognition — Investments are presented at fair value based on information provided by JP Morgan Chase (the “trustee”), NEPC, and the investment managers. The fair value of investments is based on published market prices and quotations from major investment brokers at current exchange rates, as available, or net asset value, which is determined to be a practical expedient for measuring fair value. Many factors are considered in arriving at that value. All investments are registered, with securities held by the Plan’s trustee, in the name of the Plan. Gains and losses on investments that were sold during the year are included in in the statement of plan net position.

Risks and Uncertainties — The Plan’s investments are exposed to various risks, such as interest rate, market, and credit risk. Due to the level of risk associated with certain investment securities and level of uncertainty related to changes in the value of investment securities, it is possible that changes in risks in the near term would materially affect the amounts reported in the Plan’s financial statements.

The financial markets, both domestically and internationally, have demonstrated significant volatility on a daily basis, which affects the valuation of investments. The Plan utilizes asset allocation strategies that are intended to optimize investment returns over time in accordance with investment objectives and with acceptable levels of risk.

Investments measured at readily determined fair value (FV)
(In Thousands)

	December 31, 2018	Quoted Price in Active Markets for Identical Assets Level 1	Significant Other Observable Inputs Level 2	Significant Unobservable Inputs Level 3
Equity Securities:				
Separate account large-cap equity funds	$ 261,396	261,396	$ -	$ -
Separate account small-cap equity funds	197,302	197,302	-	-
Separate account small-Real Estate Investments Trusts	40,313	40,313	-	-
Total equity investments	499,011	499,011	-	-
Debt Securities				
Separate account debt funds	288,180	-	288,180	-
Total debt investments	288,180	-	288,180	-
Total investments by fair value	$ 787,191	499,011	288,180	$ -

Investments measured at the net asset value (NAV)
(In Thousands)

	December 31, 2018	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Equity Securities:				
Commingled large cap equity funds	$ 121,990	$ -	Daily	None
Commingled international equity funds	475,092	-	Daily	None
Commingled emerging market equity funds	113,333	-	Daily, monthly	None
Total equity investments measured at the NAV	710,415	-		
Debt Securities				
Commingled debt funds	244,072	-	Daily, monthly, quarterly	None
Mutual fund	74,270	-	Daily	None
Total debt investments measured at the NAV	318,342	-		
Absolute return:				
Directional	111,125	-	Monthly	3-60 days
Direct lending	180,185	52,294	Bi-annually	60 plus days
Distressed securities	61,410	-	Not eligible	N/A
Credit long	51,543	-	Quarterly	3-30 days
Credit long/short	80,745	-	Quarterly	3-60 days
Equity long/short	55,452	-	Quarterly	3-60 days
Event driven	86,900	1,909	Quarterly, Bi-annually	60-120 days
Global macro	94,438	-	Monthly	3-30 days
Global tactical asset allocation	243,938	-	Daily, monthly	3-30 days
Multistrategy	109,236	-	Monthly	3-30 days
Risk parity	337,396	-	Not eligible	N/A
Structured credit	7,404	-	Not eligible	N/A
Total absolute return measured at the NAV	1,419,772	54,203	Not eligible	N/A
Private equity - private equity partnerships	294,568	154,206		
Real assets				
Commingled real estate funds	209,041	14,118	Not eligible	N/A
Energy	89,905	63,140	Not eligible	N/A
Infrastructure	28,306	7,449	Not eligible	N/A
Total real assets measured at the NAV	327,252	84,707		
Short term investments measured at the NAV	157,870			
Total investments measured at the NAV	3,228,219	$ 293,116		
Total investments at fair value	$ 4,015,410			

Investments measured at readily determined fair value (FV)
(In Thousands)

	December 31, 2017	Quoted Price in Active Markets for Identical Assets Level 1	Significant Other Observable Inputs Level 2	Significant Unobservable Inputs Level 3
Equity Securities:				
Separate account large-cap equity funds	$ 261,754	261,754	$ -	$ -
Separate account small-cap equity funds	180,105	180,105	-	-
Separate account small-Real Estate Investments Trusts	41,206	41,206	-	-
Total equity investments	483,065	483,065	-	-
Debt Securities				
Separate account debt funds	192,714	-	192,714	-
Total debt investments	192,714	-	192,714	-
Total investments by fair value	$ 675,779	483,065	192,714	$ -

Investments measured at the net asset value (NAV)
(In Thousands)

	December 31, 2017	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Equity Securities:				
Commingled large cap equity funds	$ 128,693	$ -	Daily	None
Commingled international equity funds	539,445	-	Daily	None
Commingled emerging market equity funds	138,634	-	Daily, monthly	None
Total equity investments measured at the NAV	806,772	-		
Debt Securities				
Commingled debt funds	347,412	-	Daily, monthly, quarterly	None
Mutual fund	63,601	-	Daily	None
Total debt investments measured at the NAV	411,013	-		
Absolute return:				
Directional	111,615	-	Monthly	3-60 days
Direct lending	158,246	11,201	Bi-annually	60 plus days
Distressed securities	41,882	-	Not eligible	N/A
Credit long	63,562	-	Quarterly	3-30 days
Credit long/short	73,602	-	Quarterly	3-60 days
Equity long/short	59,718	-	Quarterly	3-60 days
Event driven	89,310	1,872	Quarterly, Bi-annually	60-120 days
Global macro	84,451	-	Monthly	3-30 days
Global tactical asset allocation	271,887	-	Daily, monthly	3-30 days
Multistrategy	117,063	-	Monthly	3-30 days
Risk parity	365,708	-	Not eligible	N/A
Structured credit	16,029	-	Not eligible	N/A
Total absolute return measured at the NAV	1,453,073	13,073	Not eligible	N/A
Private equity - private equity partnerships	276,850	189,147		
Real assets				
Commingled real estate funds	215,313	-	Not eligible	N/A
Energy	56,951	17,863	Not eligible	N/A
Infrastructure	23,995	7,879	Not eligible	N/A
Total real assets measured at the NAV	296,259	25,742		
Short term investments measured at the NAV	125,222			
Total investments measured at the NAV	3,369,189	$ 227,962		
Total investments at fair value	$ 4,044,968			

Concentration of Credit Risk – Individual investments held by the Plan that represents 5.0% or more of the Plan's net assets available for benefits at December 31, 2018 and 2017 are as follows:

(In Thousands)	2018	2017
Investments at fair value as determined by quoted market prices:		
Robert W. Baird and Company	$ 239,340	*

* Amount did not meet the 5.0% threshold requirement in 2017 and thus is not shown.

Credit Risk — At December 31, 2018 and 2017, the following credit quality rating has been assigned by a nationally recognized rating organization:

(In Thousands) Quality Rating	2018 Fair Value	Percentage of Fixed Income Portfolio	2017 Fair Value	Percentage of Fixed Income Portfolio
AAA	$ 123,123	9.29 %	$ 158,310	19.05 %
AA	180,474	13.61	28,001	3.37
A	66,304	5.00	85,769	10.32
BBB	102,332	7.72	119,714	14.41
BB	99,366	7.49	93,143	11.21
B	82,629	6.23	60,596	7.29
CCC	18,733	1.41	7,443	0.90
CC	143	0.01	956	0.11
C	1,376	0.10	84	0.01
D	6,375	0.48	17	-
Not Rated	368,472	27.79	138,278	16.64
Credit risk debt securities	1,049,327	79.13	692,311	83.31
U.S. Government bonds	276,776	20.87	138,715	16.69
Total fixed income securities	1,326,103	100.00 %	831,026	100.00 %
Other securities not rated — equity, international funds and foreign corporate bonds	2,689,307		3,213,942	
Total investments	$ 4,015,410		$ 4,044,968	

Interest Rate Risk Exceptions — Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. Duration is a measure of sensitivity to interest rate risk. The greater the duration of a bond or portfolio of bonds, the greater its price volatility will be in response to a change in interest rate risk and vice versa. Modified duration is an indicator of bond price's sensitivity to a parallel 100 basis point change in interest rates.

Investment Fund (In Thousands)	2018 Fair Value	2018 Duration	2017 Fair Value	2017 Duration
Chase	$ 288,180	12.90	$ 192,071	11.44
Allianz Structured Alpha Fund	111,125	0.13	111,615	0.13
Wellington Blended Emerging Market Debt Fund	68,370	5.44	78,753	5.70
Bridgewater All Weather Fund	95,896	8.30	86,942	7.70
Wellington Opportunistic Fund	54,070	1.52	34,515	1.70
Bridgewater Pure Alpha Fund	142,098	(0.90)	(121,986)	(7.90)
Bridgewater Pure Alpha Markets Fund	(16,455)	(7.10)	(13,934)	(6.80)
GAM Unconstrained Bond Fund	34,810	0.10	168,253	(0.17)
Northern Trust William Capital Fund	8,651	-	8,341	-
Park Square Capital Credit Opportunities Fund II	32,238	-	33,041	-
Park Square Capital Credit Opportunities Fund III	14,156	-	-	-
Libremax Partners Fund	80,745	2.63	15,677	3.87
Gramercy Distressed Opportunistic Fund	22,474	0.26	12,765	(0.05)
Makuria Credit Fund	17,666	5.38	31,449	5.50
Crescent Capital High Income Fund	51,516	2.56	30,205	2.43
Orchard Landmark Fund	95,495	1.44	-	-
Fir Tree Realization Fund	-	-	6	-
PIMCO Distressed Credit Opportunities Fund	51,543	2.18	-	-
Wellington Global Managed Risk Fund	73,571	6.20	103,617	10.60
State Stree Real Asset Fund	24,062	5.84	25,237	5.84
State Stree Long US Treasury Index Fund	28,183	17.35	-	-
EIG Energy Fund XV	3,487	-	4,109	-
EIG Energy Fund XVI	4,878	-	5,638	-
Riverstone Credit Partners Fund	17,408	4.00	-	-
NEPC Syndication Partners Fund	1,723	4.00	-	-
Canyon Value Realization Fund	20,213	3.26	24,712	2.50
Total fixed income securities	1,326,103		831,026	
Portfolio modified duration		5.20		7.06
Investments with no duration reported	$ 2,689,307		$ 3,213,942	
Total investments	$ 4,015,410		$ 4,044,968	

Foreign Currency Risk — Foreign currency risk is the risk that changes in exchange rates will adversely affect the fair value of an investment. Some of the Plan's investment managers will have foreign currency exposure through holdings of foreign securities, currency derivatives or private investments whose revenue will be non-USD based. The Plan also holds investments in American Depository Receipts ("ADRs") which are not included in the below schedule since they are denominated in U.S. dollars and accounted for at fair market value.

The Plan's foreign currency exposures as of December 31, 2018 and 2017 are as follows (amounts in U.S. dollars, in thousands):

Foreign Currency Holdings in US $ (In Thousands)	December 31, 2018	December 31, 2017
Argentina Peso	$ 16,926	$ 3,930
Dollar (Australian)	22,656	28,143
Bahraini Dinar	400	432
Bangladesh (Taka)	384	425
Bermuda Dollar	2,943	837
Botswana Pula	170	160
Brazil Cruzeiro Real	31,211	15,263
Bulgarian Lev	15	17
Dollar (Canadian)	34,720	19,021
Cayman Island dollar	829	-
Chilean Peso	7,423	5,975
China (Yuan Renminbi)	17,250	17,595
Colombian Peso	4,274	4,206
Croatia Kuna	516	536
Czech Koruna	1,286	(1,015)
Krone (Danish)	6,926	2,495
Dominican Peso	10	-
Egyptian Pound	1,195	2,801
Euro	99,097	76,248
Ghanaian Cedi	187	302
Geogian Lari	962	2,114
Dollar (Hong Kong)	13,112	15,402
Hungary (Forint)	4,141	1,344
Icelandic Krona	2,907	4,254
Indian Rupee	23,127	26,221
Indonesia Rupiah	7,496	15,783
Israeli (Shekel)	1,427	1,299
Yen (Japan)	11,952	9,483
Jordanian Dinar	382	458
Kazakhstani Tenge	432	638
Kenyan Shilling	400	419
Kuwait Dinar	808	862
Lebanese Pound	50	120
Laos Kip	466	-
Malaysian (Ringgit)	4,438	7,775
Mauritius (Rupee)	946	926
Mexican New Peso	3,744	6,784
Morocco Dirham	370	431
Dollar (New Zealand)	(518)	5,465
Nigerian Naira	414	423
Krone (Norwegian)	2,265	5,452
Omanian Rial	332	434
Pakistani Rupee	1,030	2,142
Panama Balboa	159	163
Peru Sol	1,888	2,655
Philippines Peso	3,278	2,215
Polish (New Zloty)	(91)	2,944
Pound (Sterling)	45,323	73,238
Qatar Riyal	1,002	1,164
Romanian Leu	1,728	590
Russian Federation Rouble	132	5,393
Saudi Riyal	818	430
Singapore Dollar	(4,147)	5,758
South African Rand	11,592	9,652
South Korean Won	21,130	30,450
Sri Lankan Rupee	334	421
Krona (Swedish)	6,416	22,321
Franc (Swiss)	15,406	10,449
Thai (Bhat)	5,550	4,937
Dollar (Taiwan, New)	10,695	24,812
Tunisian Dinar	150	175
Turkish Lira	50	4,774
Ukraine Hryvnia	69	-
UAE Dirham	1,252	2,175
Uruguayan Pesos	20	513
Vietnam Dong	739	689
Other	9,934	(14,625)
Total	$ 462,528	$ 476,893

Additional Information — The Plan holdings are part of the MTA Master Trust of which the MTA Defined Benefit Plan participates on a percentage basis. The percentage of the Plan ownership for the year ended December 31, 2018 and December 31, 2017 was 84.19% and 82.54% respectively.

	Master Trust Total Plan	MTA Defined Benefit Plan	Master Trust Total Plan	MTA Defined Benefit Plan
	December 31, 2018		December 31, 2017	
	(In thousands)			
Total Investments:				
Investments measured at readily determined fair value	$ 935,046	$ 787,191	$ 818,745	$ 675,779
Investments measured at the NAV	3,834,562	3,228,219	4,074,473	3,369,189
Total investments measured at fair value	$ 4,769,608	$ 4,015,410	$ 4,893,218	$ 4,044,968

4. NET PENSION LIABILITY

The components of the net pension liability of the Plan at December 31, 2018 and 2017 were as follows (in thousands):

	December 31, 2018	December 31, 2017
Total pension liability	$ 5,488,490	$ 5,072,814
Fiduciary net position	4,024,480	4,051,534
Net pension liability	1,464,010	1,021,280
Fiduciary net position as a percentage of the total pension liability	73.33%	79.87%

Actuarial Methods and Assumptions

The total pension liability as of December 31, 2018 was determined by an actuarial valuation date of January 1, 2018, that was updated to roll forward the total pension liability to the respective year-end. Actuarial valuations are performed annually as of January 1.

Discount Rate

The discount rate used to measure the total liability as of December 31, 2018 and 2017 was 7.0%. The projection of cash flows used to determine the discount rate assumed that plan contributions will be made in accordance with the Employer funding policy as projected by the Plan's actuary. Based on those assumptions, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments of current and inactive plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all projected benefit payments to determine the total pension liability.

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability of the Plan, calculated using the discount rate of 7.00 percent; as well as what the Plan's net pension would be if it were calculated using a discount rate that is 1-percentage point lower (6.00 percent) or 1-percentage point higher (8.00 percent) than the current rate:

2018
(in thousands)

	1% Decrease 6.00%	Current Discount Rate 7.00%	1% Increase 8.00%
Net pension liability	$2,146,497	$1,464,010	$888,282

2017
(in thousands)

	1% Decrease 6.00%	Current Discount Rate 7.00%	1% Increase 8.00%
Net pension liability	$1,648,216	$1,021,280	$492,284

Additional Important Actuarial Valuation Information

Valuation date	January 1, 2018
Valuation timing	Actuarially determined contributions calculated as of December 31, for the fiscal year and discounted to July 1 to reflect monthly payments throughout the year.
Actuarial cost method	Frozen Initial Liability cost method
Amortization method	For FIL bases, period specified in current valuation report. Future gains/ losses are amortized through the calculation of the normal cost in accordance with FIL cost method amortized based on expected working lifetime, weighted by salary, of the projected population for each group.
Actuarial asset valuation method	Actuarial value equals market value less unrecognized gains/losses over a 5-year period. Gains/losses are based on market value of assets
Mortality	Based on experience of all MTA members reflecting mortality improvement ona generational basis using Scale AA
Actuarial assumptions:	
Investment rate of return	7.0%, net of investment expenses
Projected salary increases	Varies by years of employment, and employee group; 3.0% GWI increases for TWU Local 100 MTA Bus hourly employees
COLAs	55% of inflation assumption or 1.375%, if applicable
Inflation/Railroad Retirement wage base	2.5%; 3.5%

Valuation date	January 1, 2017
Valuation timing	Actuarially determined contributions calculated as of December 31, for the fiscal year and discounted to expected payment dates (July 1 for these projections).
Actuarial cost method	Frozen Initial Liability
Amortization method	For FIL bases, period specified in current valuation report. Future gains/ losses are amortized through the calculation of the normal cost in accordance with FIL cost method amortized based on expected working lifetime, weighted by salary, of the projected population for each group.
Actuarial asset valuation method	Actuarial value equals market value less unrecognized gains/losses over a 5-year period. Gains/losses are based on market value of assets
Mortality	Based on experience of all MTA members reflecting mortality improvement ona generational basis using Scale AA
Actuarial assumptions:	
Investment rate of return	7.0%
Projected salary increases	Varies by years of employment, and employee group; 3.0% GWI increases for TWU Local 100 MTA Bus hourly employees
COLAs	55% of inflation assumption or 1.375%, if applicable
Inflation/Railroad Retirement wage base	2.5%; 3.5%

Calculation on Money-Weighted Rate of Return

The money-weighted rate of return considers the changing amounts actually invested during a period and weights the amount of pension plan investments by the proportion of time they are available to earn a return during that period. External cash flows are determined on a monthly basis and are assumed to occur at the beginning of each month. External cash inflows are netted with external cash outflows, resulting in a net external cash flow in each month.

2018 Schedule of Calculations of Money-Weighted Rate of Return

(In thousands)

	Net External Cash Flows	Periods Invested	Period Weight	Net External Cash Flows With Interest
Beginning Value - January 1, 2018	$4,051,534	12.00	1.00	$3,902,670
Monthly net external cash flows:				
January	(8,342)	12.00	1.00	(8,035)
February	8,976	11.00	0.92	8,672
March	8,976	10.00	0.83	8,701
April	8,976	9.00	0.75	8,727
May	8,976	8.00	0.67	8,753
June	9,189	7.00	0.58	8,992
July	9,189	6.00	0.50	9,019
August	9,356	5.00	0.42	9,210
September	9,831	4.00	0.33	9,710
October	9,557	3.00	0.25	9,468
November	9,917	2.00	0.17	9,854
December	38,768	0.26	0.02	38,739
Ending Value - December 31, 2018				$4,024,480
Money-Weighted Rate of Return	-3.67%			

2017 Schedule of Calculations of Money-Weighted Rate of Return

(In thousands)

	Net External Cash Flows	Periods Invested	Period Weight	Net External Cash Flows With Interest
Beginning Value - January 1, 2017	$3,419,971	12.00	1.00	$3,931,053
Monthly net external cash flows:				
January	(8,619)	12.00	1.00	(9,907)
February	6,311	11.00	0.92	7,174
March	6,275	10.00	0.83	7,044
April	7,808	9.00	0.75	8,667
May	6,830	8.00	0.67	7,498
June	9,802	7.00	0.58	10,626
July	9,802	6.00	0.50	10,509
August	9,802	5.00	0.42	10,392
September	8,180	4.00	0.33	8,564
October	9,802	3.00	0.25	10,149
November	9,802	2.00	0.17	10,037
December	39,617	0.25	0.02	39,728
Ending Value - December 31, 2017				$4,051,534
Money-Weighted Rate of Return	14.94%			

Calculation on Long-Term Expected Rate of Return

The best-estimate range for the long-term expected rate of return is determined by adding expected inflation to expected long-term real returns and reflecting expected volatility and correlation. The capital market assumptions are per Milliman's investment consulting practice as of December 31, 2018 and 2017.

SCHEDULE OF LONG TERM EXPECTED RATE OF RETURN FOR 2018

Asset Class	Index	Target Allocation*	Real Rate of Return
US Core Fixed Income	Barclays Aggregate	9.00%	2.03%
US Long Bonds	Barclays Long Term Government/Credit	1.00%	2.44%
US Bank/Leveraged Loans	Credit Suisse Leveraged Loan	7.00%	3.08%
US Inflation-Indexed Bonds	Barclays US TIPS	2.00%	1.16%
US High Yield Bonds	BAML High Yield	4.00%	3.93%
Emerging Market Bonds	JPM EMBI Plus	2.00%	3.76%
US Large Caps	S&P 500	12.00%	4.71%
US Small Caps	Russell 2000	6.00%	5.93%
Foreigh Developed Equity	MSCI EAFE NR	12.00%	6.15%
Emerging Market Equity	MSCI EM NR	5.00%	8.22%
Global REITS	FTSE EPRA/NAREIT Developed	1.00%	5.80%
Private Real Estate Property	NCREIF Property	4.00%	3.69%
Private Equity	Cambridge Private Equity	9.00%	9.50%
Commodities	Commodity	1.00%	2.85%
Hedge Funds - MultiStrategy	HFRI: Fund Wtd Composite	16.00%	3.28%
Hedge Funds - Event Driven	HFRI Event Driven	6.00%	3.38%
Hedge Funds - Equity Hedge	HFRI Equity Driven	3.00%	3.85%
Assumed Inflation - Mean			2.50%
Assumed Inflation - Standard Deviation			1.65%
Portfolio Nominal Mean Return			7.19%
Portfolio Standard Deviation			10.87%

SCHEDULE OF LONG TERM EXPECTED RATE OF RETURN FOR 2017

Asset Class	Index	Target Allocation*	Real Rate of Return
US Core Fixed Income	Barclays Aggregate	10.00%	1.96%
US High Yield Bonds	BAML High Yield	8.00%	4.62%
Global Bonds	Citi WGBI	10.00%	0.34%
Emerging Market Bonds	JPM EMBI Plus	3.00%	3.30%
US Large Caps	S&P 500	10.00%	4.31%
US Small Caps	Russell 2000	5.50%	5.57%
Global Equity	MSCI ACWI NR	10.00%	4.99%
Foreigh Developed Equity	MSCI EAFE NR	10.00%	5.57%
Emerging Market Equity	MSCI EM NR	3.50%	7.91%
Global REITS	FTSE EPRA/NAREIT Developed	5.00%	5.62%
Private Real Estate Property	NCREIF Property	3.00%	3.64%
Private Equity	Cambridge Private Equity	7.00%	8.99%
Hedge Funds - MultiStrategy	HFRI: Fund Wtd Composite	15.00%	3.35%
Assumed Inflation - Mean			2.50%
Assumed Inflation - Standard Deviation			1.85%
Portfolio Nominal Mean Return			6.80%
Portfolio Standard Deviation			11.54%
Long-Term Expected Rate of Return selected by MTA			7.00%

* Based on March 2014 Investment Policy

5. CONTRIBUTIONS

Employer contributions are actuarially determined on an annual basis. Amounts recognized as receivables for contributions include only those due pursuant to legal requirements. Employee contributions to the Plan are recognized in the period in which the contributions are due. There are no contributions required under the Metropolitan Suburban Bus Authority Employee's Pension Plan.

The following summarizes the types of employee contributions made to the Plan.

Effective January 1, 1994, covered MTA Metro-North Railroad and MTA Long Island Rail Road non-represented employees are required to contribute to the Plan to the extent that their Railroad Retirement Tier II employee contribution is less than the pre-tax cost of the 3% employee contributions. Effective October 1, 2000, non-represented employee contributions, if any, were eliminated after 10 years of making contributions to the Plan. MTA Metro-North Railroad employees may purchase prior service from January 1, 1983 through December 31, 1993 and MTA Long Island Rail Road employees may purchase prior service from January 1, 1988 through December 31, 1993 by paying the contributions that would have been required of that employee for the years in question, calculated as described in the first sentence, had the Plan been in effect for those years.

Police Officers who became participants of the MTA Police Program prior to January 9, 2010 contribute to that program at various rates. Police Officers who became participants on or after January 9, 2010 but before April 1, 2012 contribute 3% up to the completion of 30 years of service, the maximum amount of service credit allowed. Police Officers who become participants on or after April 1, 2012 contribute 3%, with additional new rates starting April 2013, ranging from 3.5%, 4.5%, 5.75%, to 6%, depending on salary level, for their remaining years of service.

MTA Bus represented participants make contributions in accordance with their respective collective bargaining agreements and arbitration awards. MTA Bus non-represented employees are accessed contributions for their flat rate benefit of $10.33 for each week for the period from January 1, 2012 through December 31, 2016. Effective January 1, 2017, MTA Bus non-represented operating employee hired prior to April 1, 2012 contribute 2% of gross wages. MTA Bus non-represented non-operating employee hired prior to April 1, 2012 contribute 4.85% of gross wages for ten years of service after January 1, 2017, and then 1.85% gross salary thereafter until retirement. Contributions levels for MTA Bus non-represented employees hired on or after April 1, 2012, which are required until retirement, are determined every year at the beginning of the calendar year, and are based on annual wages during the prior year and the following schedule:

Annual Wages Earned During the Prior Year	Contribution Rate
Up to $45,000	3.00%
$45,001 to $55,000	3.50%
$55,001 to $75,000	4.50%
$75,001 to $100,000	5.75%
Greater than $100,000	6.00%

In 2017, a reserve was established for fifteen former MTA employees in accordance with Chapter 533 of the Laws of 2015. The transfer of this reserve in the amount of $1.6 million, to the New York State and Local Police and Fire Retirement System allowed former MTA Police employees to transfer membership and contributions to the New York State and Local Police and Fire Retirement System from the MTA Defined Benefit Plan.

Covered MTA Metro-North Railroad represented employees and MTA Long Island Rail Road represented employees who first became eligible to be Plan participants prior to January 30, 2008 contribute 3% of salary. MTA Staten Island Railway employees contribute 3% of salary except for represented employees hired on or after June 1, 2010 who contribute 4%. MTA Long Island Rail Road represented employees who became participants after January 30, 2008 contribute 4% of salary. For the MTA Staten Island Railway employees, contributions are not required after the completion of 10 years of credited service. MTA Long Island Rail Road represented employees are required to make the employee contributions for 10 years, or 10 years if hired after certain dates in 2014 as per collective bargaining agreements. Certain Metro-North represented employees, depending on their collective bargaining agreements, are required to make the employee contributions until January 1, 2014, January 1, 2017, June 30, 2017, or the completion of required years of credited service as per the relevant collective bargaining agreements.

Covered MTA Bus represented employees and certain non-represented employees are required to contribute a fixed dollar amount, which varies, by Depot. Currently, non-represented employees at certain Depots, contribute $21.50 per week. Non-represented employees at Eastchester hired prior to 2007 contribute $25 per week. Represented employees at Baisley Park, College Point, Eastchester, Far Rockaway, JFK, LaGuardia and Yonkers Depots contribute $29.06 per week; Spring Creek represented employees contribute $32.00 per week. Certain limited number of represented employees promoted prior to the resolution of a bargaining impasse continue to participate in the plan that was in effect before their promotion. Certain MTA Bus non-represented employees who are formerly employed by the private bus companies (Jamaica, Green, Triboro and Command) at Baisley Park, Far Rockaway, JFK, LaGuardia and Spring Creek Depots who are in the pension program covering only such employees make no contributions to the program.

MTA Bus is required to make significant annual contributions to the MTA Plan on a current basis. Pursuant to the January 1, 2018 and January 1, 2017 actuarial valuations for the MTA Plan, which included amounts for actuarial assets and liabilities relating to both active and retired members for most portions of the former private plans (excepting, for example, members of the Transport Workers Union — New York City Private Bus Lines Pension Trust who were working on school bus routes which did not become part of MTA Bus service), MTA Bus recorded pension expense equal to the valuation annual required contribution of $56.7 and $50.5 for the calendar years ended December 31, 2018 and

2017, respectively. Both of these employer contributions were paid to the MTA Plan in their respective years.

6. ACTUARIAL METHODS AND ASSUMPTIONS

A. Actuarial Valuation Method

The Frozen Initial Liability method was used for determining the actuarial determined contribution comprising the normal cost-plus amortization payments of the frozen unfunded actuarial accrued liability. The Normal Cost equals the present value of future employer normal contributions divided by the average future working lifetime factor. This factor equals the present value of future compensation or service divided by current compensation or the member count (less certain retirements), depending if benefits are pay-related, and weighted by the present value of benefits. Service is used for MTA Bus members with hourly benefits and benefits indexed to general wage increases.

The Entry Age Normal (EAN) method is used for determining changes in the frozen unfunded actuarial accrued liability due to plan provisions and assumption changes. For MTA Bus members with benefits indexed to general wage increases, the entry age normal cost uses assumed general wage increases rather than payroll, which conforms to a method compliant for GASB 67 purposes. For MTA Bus members with hourly benefits that are not indexed, the entry age normal cost is based on a level dollar method. If the benefit style changed from one type to another, the plan change base is based on the EAN method in effect prior to the change in benefit. For MTA Bus non-represented members where benefits are bifurcated into a past service level dollar component and a future service MaBSTOA benefit component, the EAN normal cost assumes that the MaBSTOA style benefits were in effect for the member's entire career.

For groups where service was reported as of the valuation date, Entry Age is based on an effective date of hire equal to the valuation date less provided service plus any purchased service, but not reflecting any military service purchased.

B. Asset Valuation Method

The Asset Valuation method smooths gains and losses over a 5-year period. The formula for the asset valuation method is as follows:

Actuarial Value of Assets = MV_t - $.8UR_1$ - $.6UR_2$ - $.4UR_3$ - $.2UR_4$

Where

MV_t = Market Value of assets as of the valuation date.

UR_n = Unexpected return during the n^{th} year preceding the valuation date. The unexpected return for a year equals the total investment return minus the total expected return. The total expected return equals the market value of assets at the beginning of the year plus the weighted net cash flow during the year multiplied by the expected rate of return.

The resulting value cannot be less than 80% or greater than 120% of the market value of assets.

The market value of assets is adjusted for any contributions made in the current year attributable to a prior year less any contributions made in a prior year and attributable to a future year, determined for each Agency independently.

C. Actuarial Assumptions Universal to all Groups

The assumptions described below were primarily determined based on an experience analysis covering the period from January 1, 2006 to December 31, 2011, with certain assumptions modified subsequently.

The postretirement mortality assumption is based on an experience analysis covering the period from January 1, 2011 to December 31, 2015.

Interest — 7.00% per annum, compounded annually.

Railroad Retirement Wage Base — 3.50% per year.

Consumer Price Index — 2.50% per year.

Cost of Living Increases - 55% of inflation assumption or 1.375% per annum, compounded annually for Police and MTA Bus members eligible for a cost of living adjustment.

Provision for Expenses — Estimated administrative expenses are added to the normal cost. Administrative expenses are based on the average of the prior three year's reported administrative expenses and are assumed payable in the middle of the plan year.

Valuation Compensation: The valuation compensation is equal to the annualized base salary as of December 31, 2017 adjusted for wage increases granted after the valuation date but retroactive to earlier periods, multiplied by the overtime assumption and assumed salary increases for the year. Salary increases are assumed to occur on average at mid-year. Retroactive wage adjustments are as follows:

- MTA Metro-North represented employees: 2.5% for IBEW, ACRE, TWU and IBT
- MTA Long Island Rail Road represented employees: 2.5% for NCFO, IAM, and IRSA and 6.0% for BRS
- MTA Staten Island Railway represented employees: 2.5% for TCU, UTU, and ATDA
- MTA Police officers: $1,000 for all officers

Mortality — Preretirement and postretirement healthy annuitant rates are projected on a generational basis using Scale AA. As a generational table, it reflects mortality improvements both before and after the measurement date.

Preretirement — RP-2000 Employee Mortality Table for Males and Females with Blue collar adjustments.

Postretirement Healthy Lives — 95% of RP-2000 Healthy Annuitant mortality table for males with Blue Collar adjustments and 116% of the rates from the RP-2000 Healthy Annuitant mortality table for females.

Postretirement Disabled Lives — RP-2014 Disabled Annuitant mortality table for males and females.

Post-termination Death Benefits - For current inactive participants eligible for post-retirement death benefits, an amount of $25,000 ($10,000 for certain M.S.B.A. inactive participants) is assumed to be payable at death. For current terminated vested members, $100,000 is assumed to be payable at death prior to retirement, except for Police officers. A load of 8.75% is applied to the liability for Police officers.

Participant Data — Service for MTA Police, MTA Metro-North Railroad and MTA Long Island Rail Road represented and management members is based on the sum of credited service, purchased service and military service provided by MTA. Retirement status and benefits based on information provided in JP Morgan file as of the valuation date, except if reported as disability retirement previously, the member continued to be treated as a disability retirement.

For inactive MTA Police, MTA Metro-North and MTA Long Island Rail Road represented and management participants, future offsets for Railroad Retirement benefits are estimated and assumed to occur at age 62 unless disabled or it appears the offset has occurred. For inactive MTA Long Island Rail Road Pension participants, offsets for Railroad Retirement benefits are estimated and assumed to occur at the member's age 65. Benefits, net of any Railroad Retirement benefits, are estimated for vested members who terminated during the past year if not provided by the Authority.

For inactive MTA Bus participants eligible for a COLA, including retroactive benefit increases that had not been reflected in the JP Morgan data, the increased benefits and basis for the COLA were estimated based on the terms of the Award.

D. Changes in Actuarial Assumptions Universal to all Groups

There are no changes in actuarial assumptions since the prior valuation.

E. Actuarial Assumptions — MTA Defined Benefit Pension Plan — Management

Salary Scale — Salaries are assumed to increase in accordance with the following schedule:

Years of Service	Rate of Increase
0	6.00 %
1	5.00
2	4.25
3	4.00
4+	3.50

Termination — Withdrawal rates vary by years of service and sex. Illustrative rates are shown below:

Years of Service	Male	Female
0 - 1	5.00 %	7.50 %
2 - 3	3.25	4.00
4	2.50	4.00
5 - 9	2.25	3.50
10 - 19	1.50	3.00
20+	1.00	1.50

Retirement — Rates vary by age and type of retirement. Illustrative rates are shown below:

A. For Management employees hired prior to January 31, 2008.

Age	Reduced Early Retirement	Unreduced Early Retirement
55	5.00 %	10.00 %
56	5.00	7.50
57	5.00	5.00
58	5.00	5.00
59	5.00	5.00

B. For Management employees hired on or after January 31, 2008.

Age	Reduced Early Retirement	Unreduced Early Retirement
55	3.00 %	10.00 %
56	3.00	7.50
57	3.00	5.00
58	3.00	5.00
59	3.00	5.00
60	3.00	30.00
61	3.00	30.00

C. For all management employees.

Normal Retirement:

- 5% per year if members have fewer than 10 years of service
- 15% per year if members have 10 but fewer than 20 years of service
- 30% per year if member have 20 or more years of service
- Certain retirement age is age 80

Disability — Rates vary by age, sex and type of disability beginning at benefit eligibility. Illustrative rates are shown below:

	Ordinary		Accidental			Ordinary		Accidental	
Age	M	F	M	F	Age	M	F	M	F
20	0.015 %	0.020 %	0.010 %	0.005 %	45	0.176 %	0.147 %	0.039 %	0.010 %
25	0.020	0.020	0.010	0.005	50	0.240	0.221	0.044	0.010
30	0.024	0.024	0.015	0.005	55	0.245	0.245	0.049	0.010
35	0.039	0.029	0.024	0.005	60	0.245	0.245	0.049	0.010
40	0.103	0.069	0.034	0.010	64	0.245	0.245	0.049	0.010

Marriage — 85% of members are assumed to be married with wives 3 years younger than their husbands.

Employee Contributions — No employee contributions have been anticipated for future years.

Changes in Actuarial Assumptions — None.

F. Actuarial Assumptions — MTA Defined Benefit Pension Plan — MTA Metro-North Represented Employees

Salary Scale — Salaries are assumed to increase in accordance with the following schedule:

Years of Service	Rate of Increase
0	3.25 %
1	10.50
2	10.00
3	9.75
4	9.25
5	14.75
6+	3.25

Overtime - Members hired on or prior to New Participant Date are assumed to earn overtime equal to 25% of their rate of pay for years when they are retirement eligible and for members on after New Participant Date are assumed to earn overtime equal to 20% of their rate of pay for years when they are retirement eligible. Otherwise, members are assumed to earn overtime equal to 18% of their rate of pay.

Termination — Withdrawal rates vary by years of service. Illustrative rates are shown below:

Years of Service	Termination Rate
0	3.50 %
1	3.25
2 - 3	2.50
4 - 9	2.25
10 - 19	1.50
20+	1.00

Retirement — Rates vary by age and type of retirement. Illustrative rates are shown below:

A. For represented employees hired prior on or prior to New Participant Date:

Age	Reduced Early Retirement	Unreduced Early Retirement
55	4.50 %	10.00 %
56	4.00	7.50
57	3.00	5.00
58	3.00	5.00
59	3.50	5.00

B. For represented employees hired after New Participant Date:

Age	Reduced Early Retirement	Unreduced Early Retirement
55	3.00 %	10.00 %
56	3.00	7.50
57	3.00	5.00
58	3.00	5.00
59	3.00	5.00
60	3.00	30.00
61	3.00	30.00

Unreduced early retirement is not available to non-ACRE represented employees hired after New Participant Date.

C. For all represented employees.

Normal Retirement:

- 5% per year if members have fewer than 10 years of service
- 15% per year if members have 10 but fewer than 20 years of service
- 30% per year if member have 20 or more years of service
- Certain retirement age is age 80

Disability — Rates vary by age, sex and type of disability beginning at benefit eligibility. Illustrative rates are shown below:

	Ordinary		Accidental			Ordinary		Accidental	
Age	**M**	**F**	**M**	**F**	**Age**	**M**	**F**	**M**	**F**
20	0.17 %	0.25 %	0.01 %	0.01 %	45	0.27 %	0.41 %	0.06 %	0.01 %
25	0.17	0.25	0.01	0.01	50	0.50	0.75	0.06	0.01
30	0.17	0.25	0.02	0.01	55	0.95	1.43	0.07	0.01
35	0.18	0.27	0.03	0.01	60	1.93	2.90	0.07	0.01
40	0.20	0.31	0.05	0.01	64	1.93	2.90	0.07	0.01

Marriage — 80% of members are assumed to be married with wives 3 years younger than their husbands.

Changes in Actuarial Assumptions — None.

G. Actuarial Assumptions — MTA Defined Benefit Pension Plan — MTA Long Island Rail Road Represented Employees

Salary Scale — Salaries are assumed to increase in accordance with the following schedule:

Years of Service	Rate of Increase
0	3.25 %
1	10.50
2	10.00
3	9.75
4	9.25
5	14.75
6+	3.25

Overtime - Members hired prior to January 31, 2008 are assumed to earn overtime equal to 30% of their pay for years when they are retirement eligible. Otherwise, members are assumed to earn overtime equal to 20% of their rate of pay.

Termination — Withdrawal rates vary by years of service. Illustrative rates are shown below:

Years of Service	Termination Rate
0	4.25 %
1 - 4	2.75
5 - 9	2.25
10+	1.25

Retirement — Rates vary by age and type of retirement. Illustrative rates are shown below:

A. For represented employees hired prior to January 31, 2018:

Age	Reduced Early Retirement	Unreduced Early Retirement
55	4.50 %	10.00 %
56	4.00	7.50
57	3.00	5.00
58	3.00	5.00
59	3.50	5.00

B. For represented employees hired on or after January 31, 2008:

Age	Reduced Early Retirement	Unreduced Early Retirement
55	3.00 %	10.00 %
56	3.00	7.50
57	3.00	5.00
58	3.00	5.00
59	3.00	5.00
60	3.00	30.00
61	3.00	30.00

C. For all represented employees.

Normal Retirement:

- 5% per year if members have fewer than 10 years of service
- 15% per year if members have 10 but fewer than 20 years of service
- 30% per year if member have 20 or more years of service
- Certain retirement age is age 80

Disability — Rates vary by age, sex and type of disability beginning at benefit eligibility. Illustrative rates are shown below:

	Ordinary		Accidental			Ordinary		Accidental	
Age	M	F	M	F	Age	M	F	M	F
20	0.17 %	0.25 %	0.01 %	0.01 %	45	0.27 %	0.41 %	0.06 %	0.01 %
25	0.17	0.25	0.01	0.01	50	0.50	0.75	0.06	0.01
30	0.17	0.25	0.02	0.01	55	0.95	1.43	0.07	0.01
35	0.18	0.27	0.03	0.01	60	1.93	2.90	0.07	0.01
40	0.20	0.31	0.05	0.01	64	1.93	2.90	0.07	0.01

Marriage — 80% of members are assumed to be married with wives 3 years younger than their husbands.

Changes in Actuarial Assumptions - None.

H. Actuarial Assumptions — MTA 20-Year Police Retirement Program

Salary Scale — Salary increases vary by years of Police Service. Illustrative rates are shown below.

Years of Service	Rate of Increase
1	12.5 %
2	14.5
3 – 4	15.5
5	39.5
6 – 9	3.5
10	4.5
11 – 14	3.5
15	5.5
16 – 19	3.5
20	4.5
21 – 24	3.5
25	4.5
26+	3.5

Overtime - Members are assumed to earn overtime equal to 30% of their rate of pay. Overtime for those hired on and after January 9, 2010 is limited to 15% of their rate of pay.

Termination — Withdrawal rates vary by length of service. Illustrative rates are shown below:

Years of Service	Termination Rate
0	6.50 %
1	2.50
2 – 4	2.00
5	0.50
6 – 9	0.35
10+	0.30

Retirement — Rates vary by year of eligibility. Illustrative rates are shown below:

For represented employees hired prior to January 31, 2018:

Years of Eligibility	Retirement Rate
1	17.00 %
2	12.00
3 – 9	10.00
10+	50.00

Certain retirement age is 62.

Disability — Rates vary by age and type of disability beginning at benefit eligibility. Illustrative rates are shown below:

Age	Ordinary	Accidental	Age	Ordinary	Accidental
20	0.043 %	0.095 %	45	0.256 %	0.500 %
25	0.043	0.095	50	0.559	0.527
30	0.062	0.095	55	0.819	0.539
35	0.096	0.115	60	0.896	0.544
40	0.138	0.316			

Cost of Living Expenses — assumed to be 1.375% per annum, compounded annually.

Marriage — 85% of members are assumed to be married with wives 3 years younger than their husbands.

Benefits Not Valued – Railroad benefit offset.

Changes in Actuarial Assumptions — None

I. Actuarial Assumptions — MSBA Employees Pension Plan

Benefit Estimates — Due to the insignificant number of active employees, benefits are estimated based on plan provisions and actuarial assumptions used for management benefits, except for the overtime assumption. No railroad offset is assumed.

Overtime – Members are assumed to earn overtime equal to the following percentage of their rates of pay:

Years of Service	Rate
Under 25 years of service	17.00 %
25 to 29 years of service	20.00
30 or more years of service	23.00

Changes in Actuarial Assumptions - None.

J. Actuarial Assumptions — MTA Defined Benefit Plan — MTA Staten Island Railway

Salary Scale — Salary increases vary by years of service. Illustrative rates are shown below.

Years of Service	Rate
0	10.00 %
1	9.50
2	9.25
3	9.00
4	8.75
5	6.00
6+	3.25

Overtime — Hourly employees are assumed to earn overtime equal to 7.50% of their rate of pay.

Termination — Withdrawal rates vary by years of service. Illustrative rates are shown below:

Year of Service	Termination Rate
0	9.00 %
1 - 3	5.50
4 - 9	3.50
10 - 19	1.40
20+	0.50

Retirement — Rates vary by age and type of retirement. Illustrative rates are shown below:

		Normal Retirement	
Age	Reduced Early Retirement	First Year Eligible	After First Eligibility
55	3.00 %	30.00 %	20.00 %
56	3.00	30.00	20.00
57	3.00	30.00	20.00
58	3.00	30.00	20.00
59	3.00	30.00	20.00
60	3.00	30.00	20.00
61	3.00	30.00	20.00

For all employees at Normal Retirement (age 60 or age 62 and later):

- 5% per year if members have fewer than 10 years of service
- 15% per year if members have 10 but fewer than 20 years of service
- 30% per year if member have 20 or more years of service
- Certain retirement age is age 80

Disability — Rates vary by age and type of disability beginning at benefit eligibility. Illustrative rates are shown below:

Age	Ordinary	Accidental	Age	Ordinary	Accidental
20	0.15 %	0.03 %	45	0.44 %	0.05 %
25	0.17	0.03	50	0.54	0.06
30	0.19	0.03	55	0.61	0.07
35	0.24	0.03	60	0.81	0.08
40	0.33	0.04			

Marriage — 80% of members are assumed to be married with wives 3 years younger than their husbands.

Benefits Not Valued — Accidental death benefits.

Changes in Actuarial Assumptions — None.

K. Actuarial Assumptions — MTA Long Island Rail Road Pension Plan – Base Benefits

Salary Scale — Rates of pay are assumed to increase at a rate of 3.0% per annum.

Overtime/Unused Vacation Pay — Earnings in each year increased by 65% for represented employees to account for overtime and by 20% in the year prior to assumed retirement and by 10% in the year prior to termination (other than retirement) for non-represented employees to account for unused vacation pay.

Termination — Withdrawal rates vary by age. Illustrative rates are shown below:

Age	Rate	Age	Rate
20	2.12 %	45	0.96 %
25	1.64	50	0.80
30	1.44	55	0.60
35	1.36	60	0.00
40	1.16	65	0.00

Retirement — Assumed retirement rate varies by year of eligibility.

Eligibility Period	Rate of Retirement
First Year	40 %
Years 2–4	33
Years 5	37
Years 6–7	35
Years 8–9	33
Years 10–15	55
Years 16 and above	100

Terminated vested participants are assumed to retire upon first eligibility, or attained age if later.

Marriage — 80% of members are assumed to be married with wives 3 years younger than their husbands.

Interest on Employee Contributions — Assumed to be 3.5% per year for future years.

Tier 1 Railroad Offset — The Tier 1 Railroad offset, which is designed similar to a Social Security Benefit, was estimated by assuming that an individual would continue to earn compensation at the level in effect at his date of termination until his eligibility for Railroad Benefits and further increased by 2% per year from the date of termination to age 65.

Benefits Not Valued — Disability benefits since the majority of active plan participants are at or near retirement eligibility.

Changes in Actuarial Assumptions — None.

L. Actuarial Assumptions — MTA Bus

Salary Scale for Non-represented Employees - Salaries are assumed to increase in accordance with the following schedule for:

Years of Service	Rate
0	6.00 %
1	5.00
2	4.25
3	4.00
4+	3.50

General Wage Increase (GWI) - The benefit level and contribution rate is assumed to increase 3% each year based on the anniversary of the last scheduled increase for TWU Local 100, ATU 1179, and ATU 1181 represented employees.

Termination — Withdrawal rates vary by years of service. Illustrative rates are shown below:

Year of Service	Termination Rate
0	17.50 %
1	4.75
2 - 9	2.75
10+	2.75

Retirement — Rates vary by age, service, employee type, Tier, Operating/Non-operating distinction, and retirement eligibility. All members are assumed to retire by age 80. Terminated vested members are assumed to retire at first eligibility for an unreduced benefit. Illustrative rates are shown below:

For represented members:

	Years of Service at Retirement		
Age	<5	5-10	10+
57-64	N/A	N/A	30 %
65-79	0 %	5 %	30
80 +	100	100	100

For certain former non-represented employees of Alliance Companies (Article 18):

Age	Retirement Rate
55–56	6 %
57–58	8
59	9
60–61	13
62	25
63–64	15
65	100

For all other non-represented employees:

Tier	Operating/Non-operating	Age	<10	10-20	20-24	25+
4	Operating	55–61	N/A	N/A	N/A	30 %
4	Operating	62–64	5 %	20 %	40 %	40
4	Operating	65–79	5	20	25	25
4	Non-operating	57–79	5	15	30	30
6	Operating	55–62	N/A	N/A	N/A	30
6	Operating	63–64	N/A	20	20	40
6	Operating	65–79	N/A	20	20	25
6	Non-operating	55–59	N/A	0.5	1	1
6	Non-operating	60–61	N/A	1	2	2
6	Non-operating	62	N/A	3	6	6
6	Non-operating	63	N/A	25	50	50
6	Non-operating	64–79	N/A	15	30	30

- For employees hired prior to January 1, 2017, retirement conditions are modified to reflect a single commencement date at the earliest eligible retirement date among former MTA Bus Article 14, 15, 16, 17, and 19 provisions and MaBSTOA-style provisions. The retirement rates above are modified as follows: Former Article 14 Tier 4 operating members with between 10 and 20 years of service and between ages 62 and 64 were assumed to retire at 15% per year phasing into 20% per year over the next 10 calendar years

- Former Article 14 Tier 4 non-operating members with between 10 and 20 years of service and between ages 57 and 64 were assumed to retire at rates ranging from 2% to 10% per year phasing into 15% per year over the next 10 calendar years

- Former Article 14 Tier 4 operating members with between 20 and 25 years of service and between ages 57 and 61 were assumed to retire at rates ranging from 4% to 10% per year

- Former Article 14 Tier 4 operating members with 25 or more years of service and between ages 55 and 61 were assumed to retire at rates ranging from 1% to 10% per year phasing into 30% per year over the next 15 calendar years

- Former Article 14 Tier 4 non-operating members with 20 or more years of service and between ages 57 and 61 were assumed to retire at rates ranging from 4% to 10% per year phasing into 30% per year over the next 15 calendar years

- Former Article 14 Tier 4 and Tier 6 non-operating members with 20 or more years at age 62 were assumed to retire at 40% and 10% per year, respectively

- Former Article 14 Tier 6 operating with between 20 and 24 years of service and between ages 57 and 61 were assumed to retire at rates ranging from 1% to 2% per year and at age 62 at 10% per year

- Former Article 15 Tier 4 operating members with between 10 and 20 years of service and between ages 62 and 64 were assumed to retire at 15% per year phasing into 20% per year over the next 10 calendar years

- Former Article 15 Tier 4 operating members with 20 or more years of service and between ages 57 and 61 were assumed to retire at 10% per year; slightly lower rates used at ages 55 and 56

- Former Article 15 Tier 4 operating members with 25 or more years of service and between ages 55 and 56 were assumed to retire at rates of 10% per year phasing into 30% per year over the next 15 calendar years

- Former Article 16 Tier 4 operating members with 25 or more years of service and between ages 57 and 61 were assumed to retire at rates of 10% per year; rates of 1% and 2% were used at ages 55 and 56, respectively

- Former Article 16 Tier 4 non-operating members with between 10 and 20 years of service and between ages 57 and 62 were assumed to retire at rates ranging from 2% to 5% per year phasing into 15% per year over the next 10 calendar years

- Former Article 16 Tier 4 non-operating members with 20 or more years of service and between ages 57 and 61 were assumed to retire at rates ranging from 4% to 10% per year phasing into 30% per year over the next 15 calendar years

- For members eligible to retire with less than 10 years of service, rates were reduced slightly

- Assumptions for former Article 17 members are consistent with former Article 15 members

- Assumptions for former Article 19 members are consistent with former Article 16 members

Disability — Rates vary by age. Illustrative rates are shown below:

Age	Rate	Age	Rate
20	0.03 %	45	0.27 %
25	0.04	50	0.48
30	0.08	55	0.87
35	0.11	60	1.30
40	0.16		

Disability rates cease upon attainment of unreduced retirement eligibility.

Marriage — 80% of members are assumed to be married with wives 3 years younger than their husbands.

Interest on Employee Contributions — Future years assumed to be 3.5% per year for represented employees and for the accumulated balances as of December 31, 2016 for non-represented employees.

Benefits Not Valued — The $2,500 post-retirement death benefit for represented members is not valued since premiums are paid outside of the plan trust.

The $10,000 post-retirement death benefit for former Queens Surface, Jamaica and Triboro Bus Service non-represented Employees (former Article 15) is not valued since premiums are paid outside of the plan trust.

The accidental death and dismemberment benefit for former Queens Surface, Jamaica and Triboro Bus Service non-represented Employees (former Article 15) is not valued as the costs are paid outside of the plan trust.

Form of payment - Normal Form, except that all former Liberty Lines Bus non-represented employees (former Article 13) members are assumed to elect the lump sum payment option. Lump sums valued using the current (2018) lump sum mortality table published by the IRS and a 4.5% assumed interest rate.

Changes in Actuarial Assumptions — Retirement rates and Salary Scale were updated for MTA Bus members receiving benefit modifications similar to the MaBSTOA Pension Plan.

7. CUSTODIAL AND OTHER PROFESSIONAL SERVICES

JP Morgan Chase Bank is the custodian and trustee of plan assets with the exception of Mellon asset management investments in which Mellon Bank N.A. is the custodian. JP Morgan Chase also provides cash receipt and cash disbursement services to the Plan. NEPC reviews the Plan's portfolio, the investment policies as stipulated by the Investment Committee and the performance of the Investment Managers. NEPC also provides audit services for the Plan's equity portfolios. Actuarial services were provided to the Plan by Milliman Inc.

8. SUBSEQUENT EVENTS

As of July 23, 2019, the Plan redeemed its entire investment in the GAM Unconstrained Bond Fund, amid allegations of misconduct by a portfolio manager. The Plan suffered no loss on its investment.

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METROPOLITAN TRANSPORTATION AUTHORITY
DEFINED BENEFIT PENSION PLAN

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)
SCHEDULE OF CHANGES IN THE EMPLOYERS' NET PENSION LIABILITY AND RELATED RATIOS
(in thousands)

		2018	2017	2016	2015	2014
Total pension liability:						
Service cost	$	162,273	148,051	138,215	124,354	121,079
Interest		358,118	335,679	308,009	288,820	274,411
Changes of benefit terms		61,890	76,511	73,521	6,230	-
Differences between expected and actual experience		75,744	(27,059)	86,809	121,556	2,322
Changes of assumptions		-	10,731	-	(76,180)	-
Benefit payments and withdrawals		(242,349)	(232,976)	(209,623)	(199,572)	(191,057)
Net change in total pension liability		415,676	310,937	396,931	265,208	206,755
Total pension liability – beginning		5,072,814	4,761,877	4,364,946	4,099,738	3,892,983
Total pension liability – ending (a)		5,488,490	5,072,814	4,761,877	4,364,946	4,099,738
Plan fiduciary net position:						
Employer contributions		338,967	321,861	280,768	221,694	331,259
Member contributions		29,902	31,027	29,392	34,519	26,006
Net investment income		(150,422)	516,153	247,708	(45,122)	102,245
Benefit payments and withdrawals		(242,349)	(232,976)	(209,623)	(199,572)	(191,057)
Administrative expenses & Transfer to investments		(3,152)	(4,502)	(3,051)	(1,962)	(9,600)
Net change in plan fiduciary net position		(27,054)	631,563	345,194	9,557	258,853
Plan fiduciary net position – beginning		4,051,534	3,419,971	3,074,777	3,065,220	2,806,367
Plan fiduciary net position – ending (b)		4,024,480	4,051,534	3,419,971	3,074,777	3,065,220
Employer’s net pension liability – ending (a)-(b)	$	1,464,010	1,021,280	1,341,906	1,290,169	1,034,518
Plan fiduciary net position as a percentage of the total pension liability		73.33%	79.87%	71.82%	70.44%	74.77%
Covered payroll	$	1,984,629	1,805,156	1,724,219	1,603,924	1,544,050
Employer’s net pension liability as a percentage of covered payroll		73.77%	56.58%	77.83%	80.44%	67.00%

In accordance with GASB No. 67, paragraph 50, such information was not readily available for periods prior to 2014.

Required Supplementary Information (Unaudited)
Schedule of Employer Contributions
(in thousands)

Fiscal Year Ending December 31	Actuarially Determined Contribution	Actual Employer Contribution	Contribution Deficiency (Excess)	Covered Payroll	Contribution as a % of covered Payroll
2009	$ 146,171	$ 146,171	$ -	$ -	N/A
2010	155,318	155,318	-	-	N/A
2011	166,188	166,188	-	-	N/A
2012	212,397	212,397	-	-	N/A
2013	242,980	242,980	-	-	N/A
2014	271,523	331,259	(59,736) *	1,544,050	21.45%
2015	273,730	221,694	52,036	1,603,924	13.82%
2016	290,415	280,768	9,647	1,724,219	16.28%
2017	316,916	321,861	(4,945)	1,805,156	17.83%
2018	331,566	338,967	(7,401)	1,984,629	17.08%

* Excess for 2014 reflects a prepaid contribution toward the 2015 Actuarially Determined Contribution.

In accordance with GASB No. 67, paragraph 50, such information was not readily available for periods prior to 2014.

METROPOLITAN TRANSPORTATION AUTHORITY
DEFINED BENEFIT PENSION PLAN

REQUIRED SUPPLEMENTARY INFORMATION (UNAUDITED)
SCHEDULE OF EMPLOYER CONTRIBUTIONS

Note to Schedule II:
The more significant actuarial assumptions and methods used in the calculation of employer contributions to the Plan for are as follows:

Valuation Dates	January 1, 2018	January 1, 2017	January 1, 2016	January 1, 2015	January 1, 2014
Actuarial cost method	Frozen initial liability (FIL) (1)	Frozen initial liability (FIL) (1)	Frozen initial liability (FIL) (1)	Frozen initial liability (FIL) (1)	Frozen initial liability (FIL) (1)
Amortization method	For FIL bases, period specified in current valuation report. Future gains/losses are amortized through the calculation of the normal cost in accordance with the FIL cost method amortized based on expected working lifetime, weighted by salary, of the projected population for each group	For FIL bases, period specified in current valuation report. Future gains/losses are amortized through the calculation of the normal cost in accordance with the FIL cost method amortized based on expected working lifetime, weighted by salary, of the projected population for each group	For FIL bases, period specified in current valuation report. Future gains/losses are amortized through the calculation of the normal cost in accordance with the FIL cost method amortized based on expected working lifetime, weighted by salary, of the projected population for each group	For FIL bases, period specified in current valuation report. Future gains/losses are amortized through the calculation of the normal cost in accordance with the FIL cost method amortized based on expected working lifetime, weighted by salary, of the projected population for each group	For FIL bases, period specified in current valuation report. Future gains/losses are amortized through the calculation of the normal cost in accordance with the FIL cost method amortized based on expected working lifetime, weighted by salary, of the projected population for each group
Actuarial asset valuation method	Actuarial value equals market value less unrecognized gains/losses over a 5-year period. Gains/losses are based on market value of assets.	Actuarial value equals market value less unrecognized gains/losses over a 5-year period. Gains/losses are based on market value of assets.	Actuarial value equals market value less unrecognized gains/losses over a 5-year period. Gains/losses are based on market value of assets.	Actuarial value equals market value less unrecognized gains/losses over a 5-year period. Gains/losses are based on market value of assets.	Actuarial value equals market value less unrecognized gains/losses over a 5-year period. Gains/losses are based on market value of assets.
Interest rate	Net rate of 7.0% for 2018, per annum, net of investment expenses	Net rate of 7.0% for 2017, per annum, net of investment expenses	Net rate of 7.0% for 2016, per annum, net of investment expenses	Net rate of 7.0% for 2015, per annum, net of investment expenses	Net rate of 7.0% for 2015, per annum, net of investment expenses
Inflation	2.5% per annum	2.5% per annum	2.5% per annum	2.5% per annum	2.5% per annum
Railroad retirenment wage base	3.5% per year	3.5% per year	3.5% per year	3.0% per year	3.0% per year
Mortality	Based on experience of all MTA members reflecting mortality improvement ona generational basis using Scale AA	Based on experience of all MTA members reflecting mortality improvement ona generational basis using Scale AA	Based on experience of all MTA members reflecting mortality improvement ona generational basis using Scale AA	Based on experience of all MTA members reflecting mortality improvement ona generational basis using Scale AA	Based on experience of all MTA members reflecting mortality improvement ona generational basis using Scale AA
Separations other than for normal retirement	Tables based on recent experience	Tables based on recent experience	Tables based on recent experience	Tables based on recent experience	Tables based on recent experience
Rates of normal retirement	Tables based on recent experience. Rates vary by age, years of service at retirement and Tier/Plan.	Tables based on recent experience. Rates vary by age, years of service at retirement and Tier/Plan.	Tables based on recent experience. Rates vary by age, years of service at retirement and Tier/Plan.	Tables based on recent experience. Rates vary by age, years of service at retirement and Tier/Plan.	Tables based on recent experience. Rates vary by age, years of service at retirement and Tier/Plan.
Salary increases	Varies by years of employment, and employee group; 3.0% General Wage Increases ("GWI") for TWU MTA Bus hourly employees	Varies by years of employment, and employee group; 3.0% General Wage Increases ("GWI") for TWU MTA Bus hourly employees	Varies by years of employment, and employee group; 3.0% General Wage Increases ("GWI") for TWU MTA Bus hourly employees	Varies by years of employment, and employee group; 3.5% for MTA Bus hourly employees	Varies by years of employment, and employee group; 3.5% for MTA Bus hourly employees
Overtime	Tables based on recent experience	Tables based on recent experience	Tables based on recent experience	Tables based on recent experience	Tables based on recent experience
Cost-of-living adjustments	1.375% per annum (2)	1.375% per annum (2)	1.375% per annum (2)	1.375% per annum (2)	1.375% per annum (2)
Provision for expenses	An average of the prior three years' administrative charges added to the normal cost	An average of the prior three years' administrative charges added to the normal cost	An average of the prior three years' administrative charges added to the normal cost	An average of the prior three years' administrative charges added to the normal cost	An average of the prior three years' administrative charges added to the normal cost

(1) Under this actuarial method, the initial liability has been established by the Entry Age Actuarial Cost Method for determining changes in the Unfunded Actuarial Accrued Liability (UAAL) due to plan provision and assumption changes.
(2) Assumes a long-term consumer price inflation assumption of 2.5% per annum, compounded annually.

Required Supplementary Information (Unaudited)
Schedule of Investment Returns

The following table displays annual money-weighted rate of return, net of investment expense.

Fiscal Year Ending December 31	Net Money-Weighted Rate of Return
2009	N/A
2010	N/A
2011	N/A
2012	N/A
2013	N/A
2014	3.58%
2015	(1.47%)
2016	7.97%
2017	14.94%
2018	(3.67%)

In accordance with GASB No. 67, paragraph 50, such information was not readily available for periods prior to 2014.

Calculation on Long-Term Expected Rate of Return

The best-estimate range for the long-term expected rate of return is determined by adding expected inflation to expected long-term real returns and reflecting expected volatility and correlation. The capital market assumptions are per Milliman's investment consulting practice as of December 31, 2018.