IB4.5

Revised Attachment 2

Investment Plan Considerations

April 5, 2018

Prepared by Aon

Presentation to Toronto Investment Board

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Agenda

Objectives of Meeting

- Gain consensus on a way to move forward
- Confirm strategic asset mix (page 8)
- Conclude on equity (page 17) and fixed income (page 23) portfolio structures
- Agree on transition plan (page 25)

Section 1 – Proposed Asset Mix

- Proposed Asset Mix
- Manager Structure Recommendations

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Introduction

- Following amendments to Ontario regulation 360/15 under the *City of Toronto Act, 2006*, Morneau Shepell conducting a study that lead to a new proposed investment policy
- The following objectives for the new policy were identified:
  - Preservation of capital
    - In the short term as well as long term on a market value basis
  - Adequate liquidity
    - Duration of assets in excess of 5 years for the long term fund and the sinking fund, but the investment policy should not lock in a significant portion of the portfolio in illiquid assets
  - Diversification of assets
    - Broader diversification of assets will reduce overall market volatility
  - Capital appreciation
    - The current economic environment and an expansion of the asset classes lead to the City's desire to generate additional investment income from the assets

Chosen Investment Policy Portfolio

- The following investment policy was chosen as a result of the analysis conducted by Morneau Shepell:

Asset Class	Allocation
Canadian Equity	4%
US Equity	10%
International Equity	3%
Emerging Markets Equity	3%
Total Equity	**20%**
Real Estate	10%
Infrastructure	0%
Total Real Assets	**10%**
Total Fixed Income	**70%**
Total	**100%**

Recommended Implementation of Proposed Portfolio

- In order to ease and simplify implementation, we recommend that the asset allocation on the following page be implemented
  - This allocation is based off of the chosen asset mix, but simplifies the regional equity structure and replaces a dedicated allocation to real estate with an allocation to real assets that could include both real estate and/or infrastructure
- We have provided risk and return figures over a 10-year period using Aon Hewitt's Capital Market Assumptions as of December 31, 2017 that are summarized in the appendix

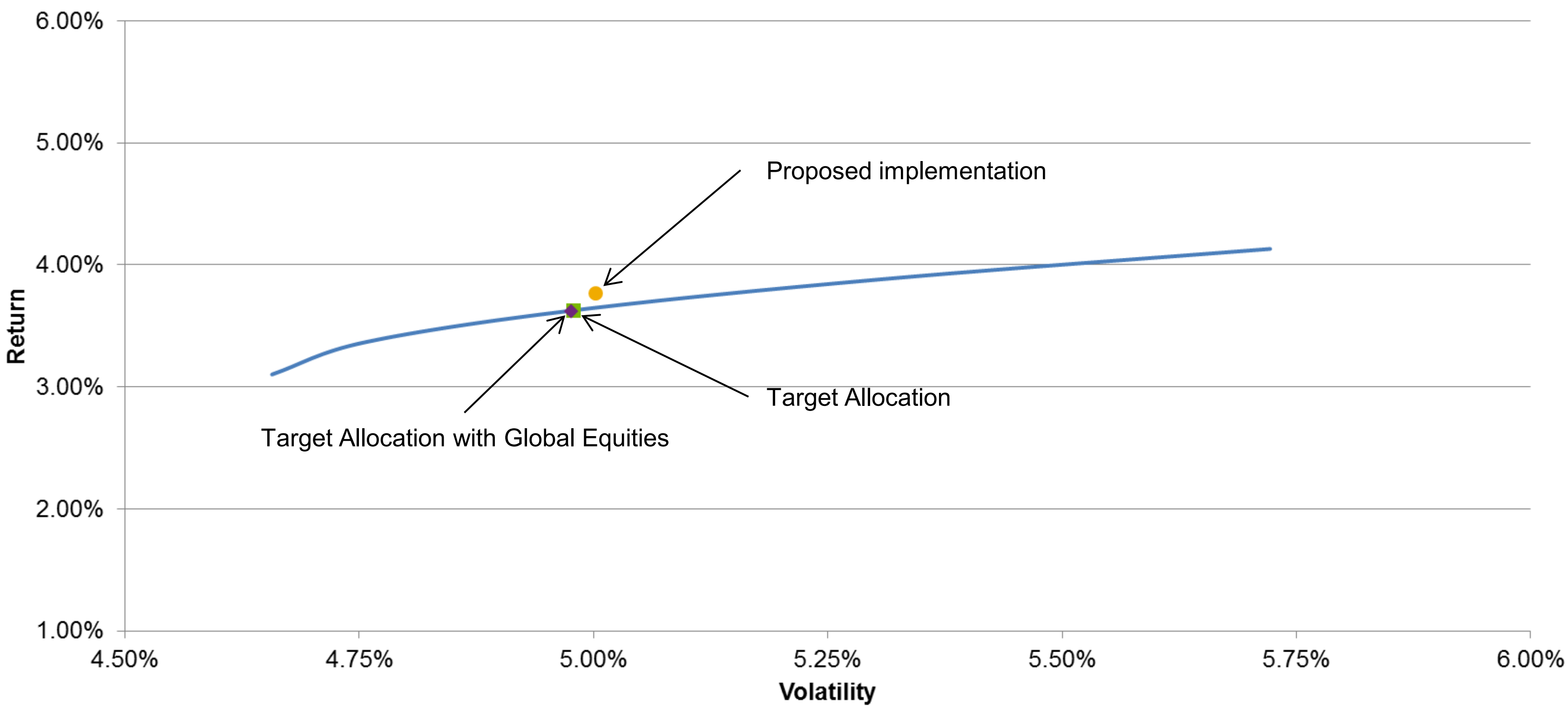
- The following risk measures are provided for each of the portfolios:
  - Average annual standard deviation (s): if returns were normally distributed, annual returns would be between the average minus the standard deviation and the average plus the standard deviation 2/3rds of the time
  - Average annual conditional tail expectation (CTE): The average of the worst 5% of returns, averaged over all 10 years of the projection
    - For example, an average annual CTE of -6% indicates that any given year, in the 5% of cases, you would expect a loss of 6%
  - 10-year annualized nominal CTE: The average of the worst 5% of 10-year annualized nominal returns
    - For example, a 10-year annualized nominal CTE of 1% indicates that the average of the worst 5% of returns that are compounded and annualized over a 10-year period is 1%

Recommended Implementation of Proposed Portfolio

Asset Class	Target Allocation	Target Allocation with Global Equity	Proposed Implementation of Target Allocation
Canadian Equity	4%	0%	0%
US Equity	10%	0%	0%
International Equity	3%	0%	0%
Emerging Markets Equity	3%	0%	0%
Global Equity (MSCI ACWI)	0%	20%	20%
Total Equity	**20%**	**20%**	**20%**
Real Estate	10%	10%	Included below
Infrastructure	0%	0%	Included below
Total Real Assets	**10%**	**10%**	**10%**
Total Fixed Income[1]	**70%**	**70%**	**70%**
Total	**100%**	**100%**	**100%**
10-Year Annualized Nominal Return	3.6%	3.6%	3.8%
Average Annual Standard Deviation	5.0%	5.0%	5.0%
Average Annual CTE	-6.6%	-6.6%	-6.4%
10-Year Annualized Nominal CTE	1.0%	1.0%	1.0%

[1] Statistics below provided assuming fixed income assets invested according to the FTSE/TMX Universe Bond Index

Comparison of Portfolios



By moving towards a broader portfolio, implementation, flexibility and governance is simplified without compromising risk/return attributes

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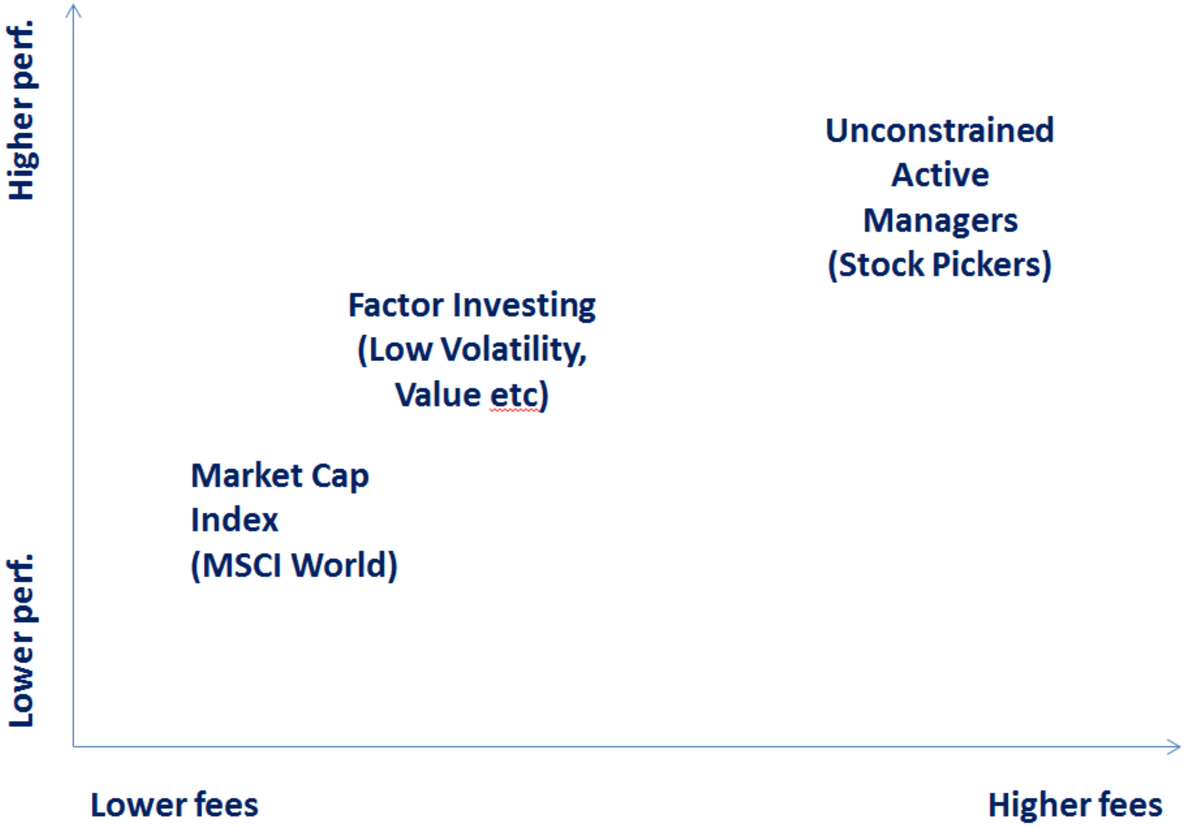
Section 2 – Equity Implementation

Equity Portfolio Options

- What is most important to the Plan?
  - Governance budget, alpha, fees?



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Equity Portfolio Options

Conviction In Equity Investing

- Aon believes using broad mandates and high conviction portfolios provides the best opportunity to add value from active management

- This pertains both to the type of managers, global high conviction managers and the number of managers in client portfolios

- Higher conviction managers generally have higher tracking error but not necessarily higher risk
  - Portfolio construction has an impact on overall portfolio risk characteristics

- To this end, we recommend the inclusion of broader mandates and more streamlined portfolios

Equity Portfolio Options

The Right Number of Managers

- Investors often overestimate the diversification benefits of increasing the number of active investment managers. We believe improvements can be made to many multi-manager equity portfolios
- Country/regional/style boxes may contribute to over-diversification
- Global equity strategies are the most efficient portfolio building block to construct a sensibly diversified portfolio
- Factor investing may be preferable to having too many active managers
- Investors of a sufficient size may reduce fees by reducing the number of managers
- Investing in fewer managers can facilitate directing more assets to managers where the prospects for outperformance are greatest

Equity Portfolio Options

Reasons one should consider an allocation to Factor Investing

- Outperformance potential and diversification benefits vs. a market cap passive index
- Better downside performance vs. market cap passive (beta of ~0.9)
  - Greater exposure to low volatility and quality factors and less to momentum
- Lower the cost of your overall equity portfolio
  - Passive multi factor allocations ~10-12 bps
- Diversification of added value sources for a portfolio invested in unconstrained equity managers
- Expect diversified multi-factor to outperform by 75 bps gross of fees vs. market cap passive index
  - Has traditionally been higher than 75 bps

Equity Portfolio Options

Potential Model Portfolios

Portfolio 1: Full Active	Portfolio 2: Active w/ Passive Diversified Multi-Factor	Portfolio 3: Passive Diversified Multi-Factor w/ Active
Active	**Active/Factor**	**Active/Factor**
Global Equity 1	Global M-Factor	Global M-Factor
Global Equity 2	Global Equity 1	Global Equity 1
Global Equity 3	Global Equity 2	Global Equity 2
Global Equity 4	Global Equity 3	Global Equity 3
Global Equity 5	Global Equity 4	

Fees	60-70 bps	50-60bps	30-40bps
Alpha	~200bps	~175bps	~125bps

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Equity Portfolio Options

Potential Options

1: Portfolio of 4-5 unconstrained global equity managers
- Higher fees, higher alpha potential, requires greater governance budget

2: Portfolio of unconstrained global equity managers and passive diversified multi-factor
- Slightly lower governance, slightly lower alpha potential, lower fees
- Suggest 35% allocation to passive multi-factor
- Equal weighting to four managers

3: Diversified multi-factor core with unconstrained global equity manager satellite positions
- Similar governance budget compared to option 2, slightly lowered alpha potential, fees lowered even more
- Suggest 50% allocation to passive multi-factor
- Equal weighting to three managers

Recommended Solution: Option 3

Implement an equity portfolio composed of:

- One diversified passive multi-factor manager ‘core’ position (50% or ~$450 million)
- Three unconstrained global equity manager ‘satellite’ positions (16.67% or ~150 million each)

Section 3 – Fixed Income Implementation

Asset Mix Guidelines

Target Asset Mix (%)	Long Term Fund and Sinking Fund		FTSE TMX Universe Bond Index
	Total Fund	Fixed Income Portion	Fixed Income Portion
Federal	30	43	37
Provincial & Municipal	30	43	35
Corporate	10	14	28
Total	70	100	100

Option 1: Custom Passive

- Use the asset mix as a custom benchmark to match the policy allocation to Federal, Provincial & Municipal and Corporate bonds

- Positives
  - Match closely the asset mix
  - Low asset management cost

- Negatives
  - The new portfolio will have a lower yield to maturity (and therefore expected return) as a result of the substantial allocation to Federal bonds
  - Matching the three FTSE sub indices (Federal, Provincial and Corporate) will lead to significant rebalancing costs from the current portfolio
  - Cash flows for Sinking Funds will not align with debt maturities

Option 2: Active + LDI

- Long Term Fund: split the money between 2-3 active managers benchmarked against the Universe Bond Index
- Sinking Funds: hire an LDI manager to match the maturity of debt repayment

- Positives
  - Long Term Fund: Opportunity to add value from active management
  - Sinking Funds: reduce risk of cash flow mismatch and interest rate risk for the planned debt repayment

- Negative
  - Long Term Fund: investment policy is restrictive (minimum rating for corporate bond portfolio is A while the corporate benchmark is A-) and this limits the ability to add value
  - Long Term Fund: transition costs to move to the Universe benchmark will be high on the illiquid portion of the portfolio

Option 3: Buy & Hold + Active + LDI

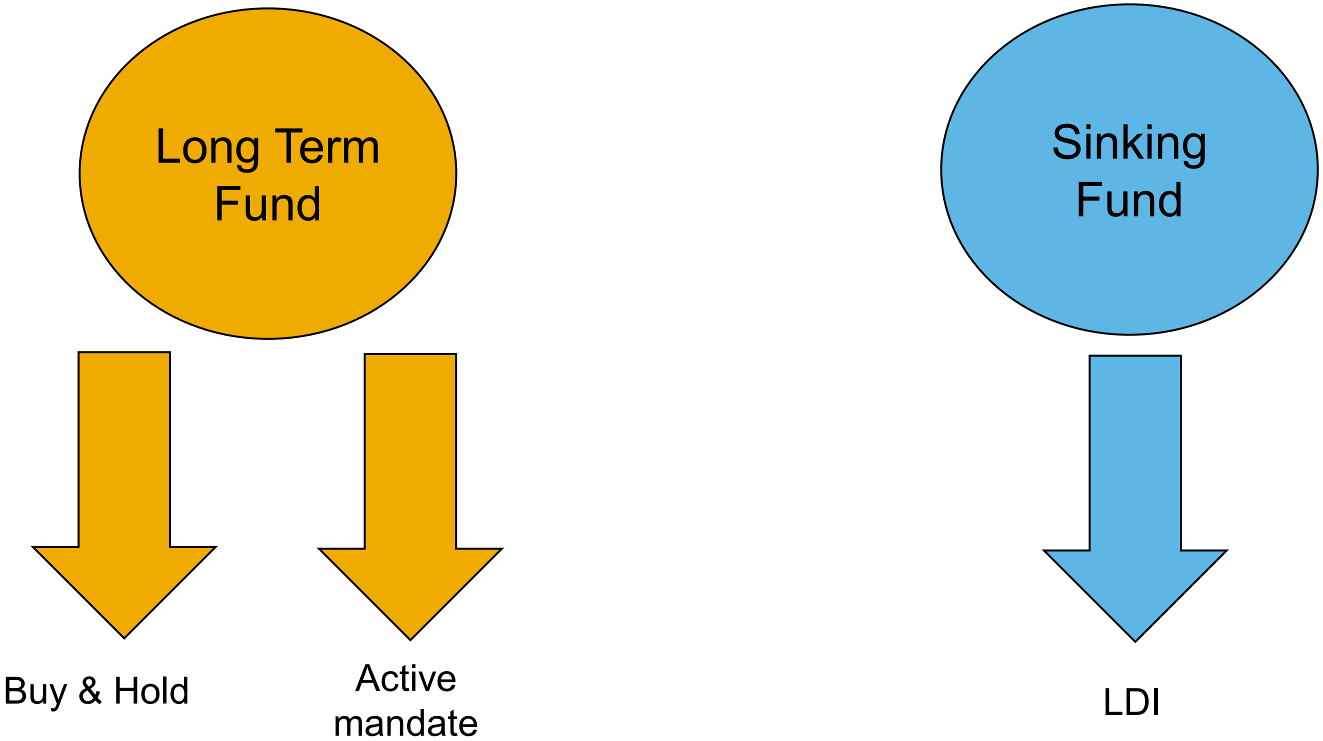
- Long Term Fund: manage the illiquid bonds (e.g. municipal bonds) on a buy & hold basis and the rest as an active mandate
- Sinking Funds: hire an LDI manager to match the maturity of debt repayment

- Positives
  – Long Term Fund: opportunity to add value from active management for part of the portfolio
  – Long Term Fund: approach limits transaction costs
  – Sinking Funds: reduce risk of cash flow mismatch and interest rate risk for the planned debt repayment

- Negative
  – Long Term Fund: investment policy is restrictive (minimum rating for corporate bond portfolio is A while the corporate benchmark is A-) and this limits the ability to add value

Recommended Solution: Option 3

- Long Term Fund: manage the illiquid bonds (e.g. municipal bonds) on a buy & hold basis and the rest as an active mandate
- Consider relaxing the A rating constraint for the corporate bond portfolio to BBB+ (full spectrum of 'investment grade')
- Sinking Funds: hire an LDI manager to match the maturity of debt repayment



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Section 4 – Transition

Transition Plan

Step 1:

- Decide on investment managers to allocate assets (equity, fixed income and real assets)

Step 2:

- Liquidate 10% (~$467 million) of fixed income assets to begin funding equity and real assets

Step 3:

- In six months, allocate a further 10% (~$467 million) to equity and real assets

Step 4:

- Fund remaining 10% (~$467 million) of allocation to equity and real assets using cash flows from fixed income portfolio

Section 5 – Roles and Responsibilities

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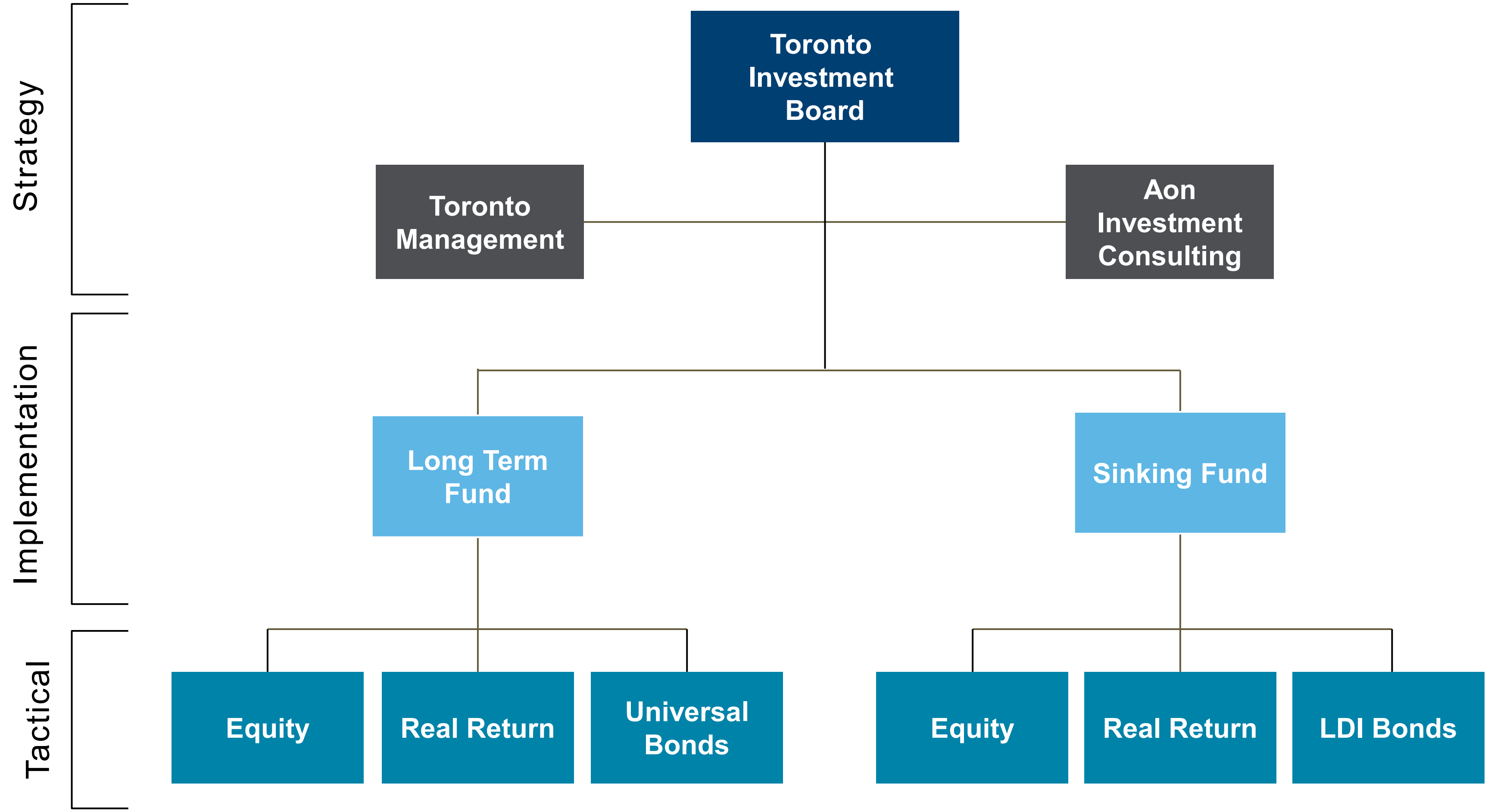
Roles and Responsibilities



Section 6 – Terms of Reference

Terms of Reference

- **Strategic Asset Allocation:** portfolio strategy that involves setting target allocations for various asset classes and rebalancing periodically
- **Tactical Asset Allocation:** a dynamic investment strategy that actively adjusts a portfolio's asset allocation
- **Return Objective:** match the performance of the composite benchmark. Active management will require an additional value added component to be outlined in the Investment Plan
- **LTF & SF Risk:** permanent loss of capital, absolute volatility
- **LTF Asset Mix:** long-term, strategic, defined by SIPP
- **Investment Plan**: document to guide implementation, management and governance of City assets

Appendix A – Additional Portfolios

Additional Portfolios

- On the following slide we show the statistics for portfolios that include a higher or lower allocation to fixed income than the 70% adopted

Asset Class	Target Allocation	Proposed with 70% FI	Proposed with 60% FI	Proposed with 80% FI
Canadian Equity	4%	0%	0%	0%
US Equity	10%	0%	0%	0%
International Equity	3%	0%	0%	0%
Emerging Markets Equity	3%	0%	0%	0%
Global Equity (MSCI ACWI)	0%	20%	30%	10%
Total Equity	**20%**	**20%**	**30%**	**10%**
Real Estate	10%	Included below	Included below	Included below
Infrastructure	0%	Included below	Included below	Included below
Total Real Assets	**10%**	**10%**	**10%**	**10%**
Total Fixed Income[1]	**70%**	**70%**	**60%**	**80%**
Total	**100%**	**100%**	**100%**	**100%**
10-Year Annualized Nominal Return	3.6%	3.8%	4.2%	3.3%
Average Annual Standard Deviation	5.0%	5.0%	5.4%	4.7%
Average Annual CTE	-6.6%	-6.4%	-7.1%	-6.0%
10-Year Annualized Nominal CTE	1.0%	1.0%	0.8%	1.2%

Appendix B – Capital Market Assumptions

Capital Market Assumptions

Asset Class	10-yr Compound Return	Average Annual Standard Deviation	Average Annual CTE 95%
Universe Bonds	2.2%	5.0%	-7.5%
Canadian Equities	6.5%	16.3%	-25.8%
U.S. Equities	6.0%	15.4%	-23.1%
Int'l Equities	6.6%	16.7%	-27.1%
All Country World Index (ACWI)	6.6%	14.8%	-22.9%
Emerging Markets	7.2%	24.2%	-34.2%
Canadian Real Estate (Direct)	4.8%	12.5%	-23.9%
U.S. Real Estate, hedged	5.5%	12.5%	-23.8%
Infrastructure (Direct), hedged	7.0%	19.0%	-29.9%

Appendix C – Target Asset Allocation ($)

Current Policy Asset Allocation ($) – December 31, 2017

Toronto Investment Board - Target Asset Allocation ($)					
Asset Class	**Index**	**Weight (%)**	**Sinking Fund Allocation ($)**	**Long Term Fund Allocation ($)**	**Total Assets**
Canadian Equity	S&P/TSX Composite	4	67,408,000	109,288,000	176,696,000
US Equity	S&P 500 (CAD)	10	168,520,000	273,220,000	441,740,000
Int'l Equity	MSCI EAFE (CAD)	3	50,556,000	81,966,000	132,522,000
Emerging Equity	MSCI EM (CAD)	3	50,556,000	81,966,000	132,522,000
Global Equity			0	0	0
Total Equity		**20**	**337,040,000**	**546,440,000**	**883,480,000**
Real Estate		10	168,520,000	273,220,000	441,740,000
Infrastructure		0	0	0	0
Real Assets	**CPI + 5%**	**10**	**168,520,000**	**273,220,000**	**441,740,000**
Federal Bonds		30	505,560,000	819,660,000	1,325,220,000
Provincial Bonds		30	505,560,000	819,660,000	1,325,220,000
Corporate Bonds		10	168,520,000	273,220,000	441,740,000
Total Bonds	**FTSE TMX Universe**	**70**	**1,179,640,000**	**1,912,540,000**	**3,092,180,000**
Toronto Hydro Shares*				250,000,000	250,000,000
Total			**1,685,200,000**	**2,982,200,000**	**4,667,400,000**

*Assets held outside custodian

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Recommended Policy Asset Allocation ($) – December 31, 2017

Toronto Investment Board - Recommended Asset Allocation ($)						
Asset Class	**Index**	**Policy Weight (%)**	**Recommended Weight**	**Sinking Fund Allocation ($)**	**Long Term Fund Allocation ($)**	**Total Assets**
Canadian Equity	S&P/TSX Composite	4	0	0	0	0
US Equity	S&P 500 (CAD)	10	0	0	0	0
Int'l Equity	MSCI EAFE (CAD)	3	0	0	0	0
Emerging Equity	MSCI EM (CAD)	3	0	0	0	0
Global Equity	MSCI ACWI (CAD)	0	20	337,040,000	546,440,000	883,480,000
Total Equity	**MSCI ACWI (CAD)**	**20**	**20**	**337,040,000**	**546,440,000**	**883,480,000**
Real Estate		10	5	84,260,000	136,610,000	220,870,000
Infrastructure		0	5	84,260,000	136,610,000	220,870,000
Real Assets	**CPI + 5%**	**10**	**10**	**168,520,000**	**273,220,000**	**441,740,000**
Federal Bonds		30	0	0	0	0
Provincial Bonds		30	0	0	0	0
Corporate Bonds		10	0	0	0	0
Total Bonds	**FTSE TMX Universe**	**70**	**70**	**1,179,640,000**	**1,912,540,000**	**3,092,180,000**
Toronto Hydro Shares*					250,000,000	250,000,000
Total				**1,685,200,000**	**2,982,200,000**	**4,667,400,000**

Appendix D – Roles and Responsibilities

Roles and Responsibilities – Toronto City Council and the CFO

City Council

- City Council has overall responsibility for the investment of the portfolios as described in Section 3 of the SIPP
- Pursuant to the Regulation, the City has delegated investment powers, duties and responsibilities over funds not immediately required by the City to the Investment Board

CFO

- Develop and review investment policies for recommendation and approval by Council
- Be a member of the Investment Board
- Provide a statement, at least annually, that all investments are consistent with the Investment Policy and Investment Plan (O. Reg. 610/06, Section 49(2)(b))
- Report to Council any issues of non-compliance with any of the investment portfolios within 30 days of becoming aware of it (O. Reg. 610/06, Section 50)
- Invest the Short Term Fund (STF) in order to meet daily operational and liquidity needs
- Invest the Trust Group of Funds and other Externally Mandated and Restricted Funds as outlined in Section 6.3
- Prepare a Semi-Annual Investment Report to Council

Roles and Responsibilities – Toronto Investment Board

- **The primary responsibility of the Investment Board will be to manage and oversee the investments of the LTF as well as those assets in the SF**

- The Regulation provides detailed information on the Investment Board (O. Reg. 610/06, Sections 46, 48, 49, and 51). A summary of these requirements include:
  - The Investment Board shall adopt and maintain an Investment Plan (O. Reg. 610/06, Section 48)
  - The Investment Board shall prepare and provide to Council, a semi-annual investment report (O. Reg. 610/06, Section 49)
  - The Investment Board may authorize agents to exercise any of the Investment Board's functions (O. Reg. 610/06, Section 51). These agents may include, but not be limited to, any of the following:
    - Consultants to provide assistance with the Investment Plan, manager search and performance evaluation
    - Investment Managers
    - Custodians
    - External legal counsel

Roles and Responsibilities – Toronto Investment Board

Other requirements of the Investment Board include the following: The Investment Board shall:

- Ensure compliance with the Council approved Investment Policy
- Develop an investment philosophy that provides the framework for creating an Investment Plan to implement the Investment Policy
- Allocate assets among Investment Managers
- Monitor, on at least a quarterly basis, the portfolio Asset Mix and investment performance
- Evaluate, on at least an annual basis, Investment Manager performance
- Appoint/discharge Investment Managers and other agents
- Supply Investment Managers with approved changes in Policy
- Establish a set of guidelines within which each Investment Manager is expected to operate, including discretion limits, diversification and quality standards, and performance expectation
- Establish written procedures and policies for the operation of the City's LTF and SF consistent with the SIPP and which include explicit delegation of authority to agents responsible for investment transactions

Roles and Responsibilities – Toronto City Staff

Corporate Finance Staff

- Assist the Investment Board with the execution of any part of the Investment Plan for the LTF and SF as requested
- Provide various administrative support to the CFO in relation to the requests and resolutions of the Investment Board
- Provide Compliance Monitoring and Exception reporting
- Support the CFO in preparing an Semi-Annual Investment Report to Council
- Determine the expected rate of return for new Sinking Fund debentures and inform the Investment Board of which sub-fund will be used and the timing of transfers into the SF

Clerk's Office

- Provide administrative support to the Investment Board for scheduled meetings. These duties will include preparing the Agenda and meeting package, booking meeting rooms, and taking minutes of the meeting

Legal Services

- Provide support to the Investment Board at scheduled meetings with regard to City policies, procedures and the City of Toronto Act, 2006
- Assist the Investment Board to obtain outside legal counsel with regards to matters requiring more specialized expertise

Accounting Services

- Make payments for various services required by the Investment Board and staff