ECKLER

# City of Saskatoon

## Asset Allocation Study

## Initial Results

September 18, 2023

# Introduction

- The City of Saskatoon is undertaking an asset allocation study in order to determine the optimal asset allocation for the City of Saskatoon General Fund
- Recommendations will give consideration of the City's investment constraints and risk/return objectives based on those constraints

Possible questions to be answered:

1. Does the current investment strategy achieve the stated objectives?
2. Is the current investment strategy optimal?
3. If not, what is the optimal investment strategy?

# General fund objectives & constraints

- **Primary objective**: Support annual operational funding
  - $504M in assets supporting annual cashflows of $13.8M per year (2.7% of assets per year)
  - Cash flows are estimated to increase by approximately 3% per year
  - A target return of roughly 3.0% should satisfy the primary objective of supporting annual spending

- **Secondary objective**: Long term growth to support major strategic projects, or growth in annual operational cashflows
  - Returns in excess of the 3.0% used to support annual operational funding will contribute to the secondary objective

- **Constraints**:
  - No appetite for a negative return over a 5-year period
  - A negative return over a calendar year should be a less than 1-in-10-year event
  - Portfolio should remain liquid enough to support strategic funding of major projects (up to $100M or 20% of the portfolio), which would be known at least 1 year in advance

# Focus metrics

- Annualized returns over a 10-year horizon
  - Expected returns vs. Downside (5th percentile return)
- Standard deviation of annual returns
- Probability of a negative return over a 1-year period

# Analysis

# Introduction

- Current investments have been modelled as universe short bonds for illustrative purposes

- This section will consider:
  - Wide range of allocations to equities / bonds
  - Allocations of 10%, 20%, and 30% to illiquid alternatives

- The goal of this analysis is to illustrate the broad range of risk and return that is possible

- Further analysis will fine-tune the structure of the portfolio and discuss implementation considerations

# Initial results

## Mixes – Bond/Equity Split

Number indicates % of equity

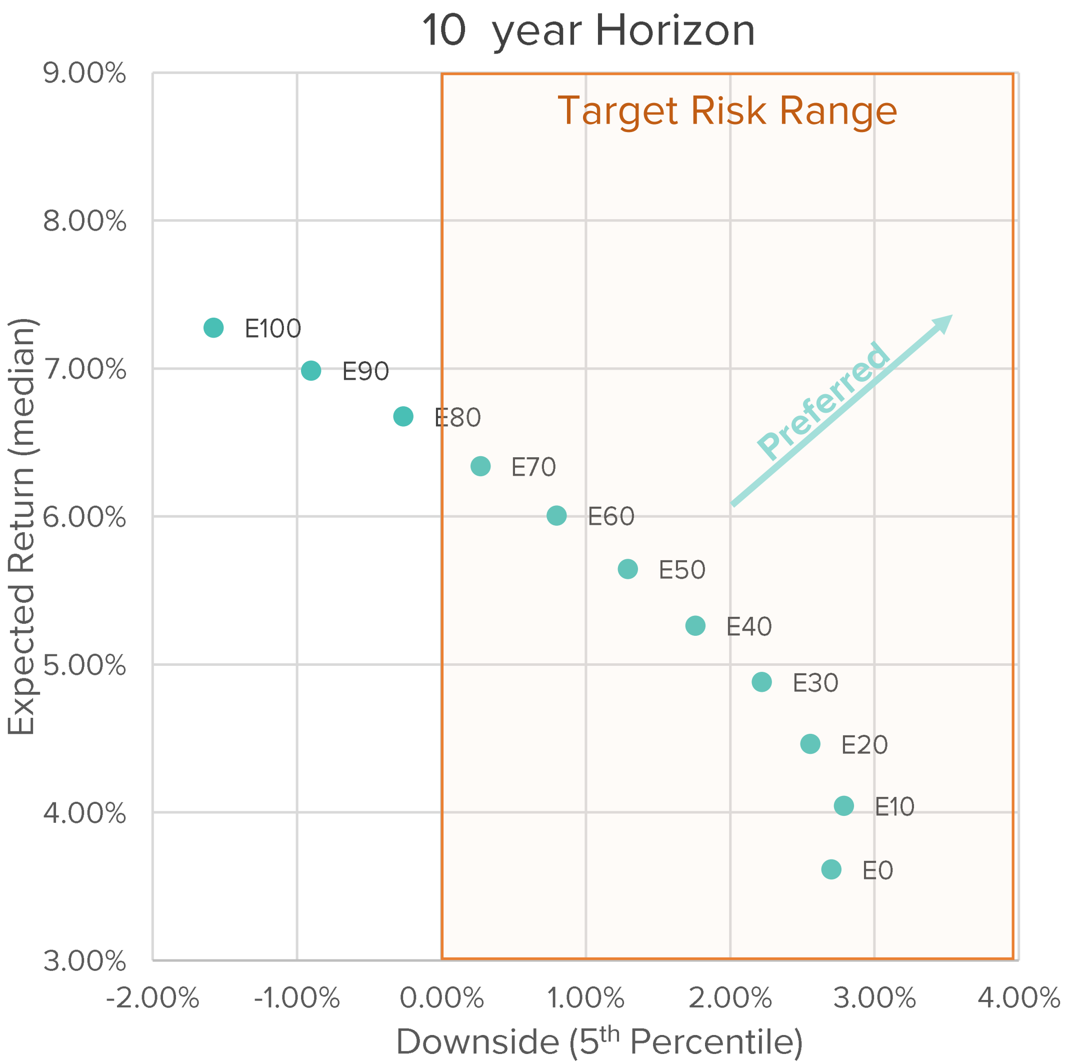
| | Asset Mix | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | E0 | E10 | E20 | E30 | E40 | E50 | E60 | E70 | E80 | E90 | E100 |
| Short Bonds | 100.0% | 90.0% | 80.0% | 70.0% | 60.0% | 50.0% | 40.0% | 30.0% | 20.0% | 10.0% | 0.0% |
| **Total Fixed Income** | **100.0%** | **90.0%** | **80.0%** | **70.0%** | **60.0%** | **50.0%** | **40.0%** | **30.0%** | **20.0%** | **10.0%** | **0.0%** |
| Canadian Equity | 0.0% | 5.0% | 10.0% | 15.0% | 20.0% | 25.0% | 30.0% | 35.0% | 40.0% | 45.0% | 50.0% |
| Global Equity | 0.0% | 5.0% | 10.0% | 15.0% | 20.0% | 25.0% | 30.0% | 35.0% | 40.0% | 45.0% | 50.0% |
| **Total Equities** | **0.0%** | **10.0%** | **20.0%** | **30.0%** | **40.0%** | **50.0%** | **60.0%** | **70.0%** | **80.0%** | **90.0%** | **100.0%** |
| **Total Alternatives** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** |
| **Total** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** |

- Asset mixes test the broad range of equity and fixed income allocations
  - Fixed income is allocated to short bonds
  - Equities are initially invested in a simple 50-50 split of Canadian and global equities

# Initial results

## Analysis – Median vs. Downside

- The minimum risk portfolio (based on a 10-year downside return) includes up to a 10% allocation to equities
  - A small allocations to equities provides diversification benefits over a fixed income only portfolio
- The target return needed to support operational funding is achieved by all portfolios



# Initial results

## Analysis – Metrics

| Annualized Return Statistics | E0 | E10 | E20 | E30 | E40 | E50 | E60 | E70 | E80 | E90 | E100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Expected Return (10-Year Annualized) | 3.6% | 4.0% | 4.5% | 4.9% | 5.3% | 5.6% | 6.0% | 6.3% | 6.7% | 7.0% | 7.3% |
| Downside Return (10-Year Annualized) | 2.7% | 2.8% | 2.6% | 2.2% | 1.8% | 1.3% | 0.8% | 0.3% | -0.3% | -0.9% | -1.6% |
| Standard Deviation | 2.3% | 2.6% | 3.6% | 4.8% | 6.1% | 7.6% | 9.0% | 10.4% | 11.9% | 13.4% | 14.9% |
| Probability of a Negative Return (Annual) | 4.4% | 3.5% | 9.2% | 15.7% | 20.1% | 22.4% | 24.0% | 26.0% | 27.4% | 28.7% | 29.6% |
| Probability of a Negative Return (10-Year Annualized) | 0.0% | 0.0% | 0.0% | 0.5% | 1.5% | 2.3% | 3.4% | 5.1% | 6.0% | 7.1% | 8.2% |

Focus Range

- Adding allocations to equities can materially increase the expected return of the fund, but can also increase the risk (measured by the probability of a negative annual return)
- A 20% equity allocation would increase the expected return of the fund by approximately 0.9% annually
  - Additionally, a negative return over a 1-year period is expected to occur less than once every 10 years
- The following slides will illustrate the additional impact of adding alternative assets to the investment strategy

# Initial results

## Mixes – Add Alternatives

Number indicates % of equities

Letter indicates % of alternatives (A=10%, B=20%,C=30%)

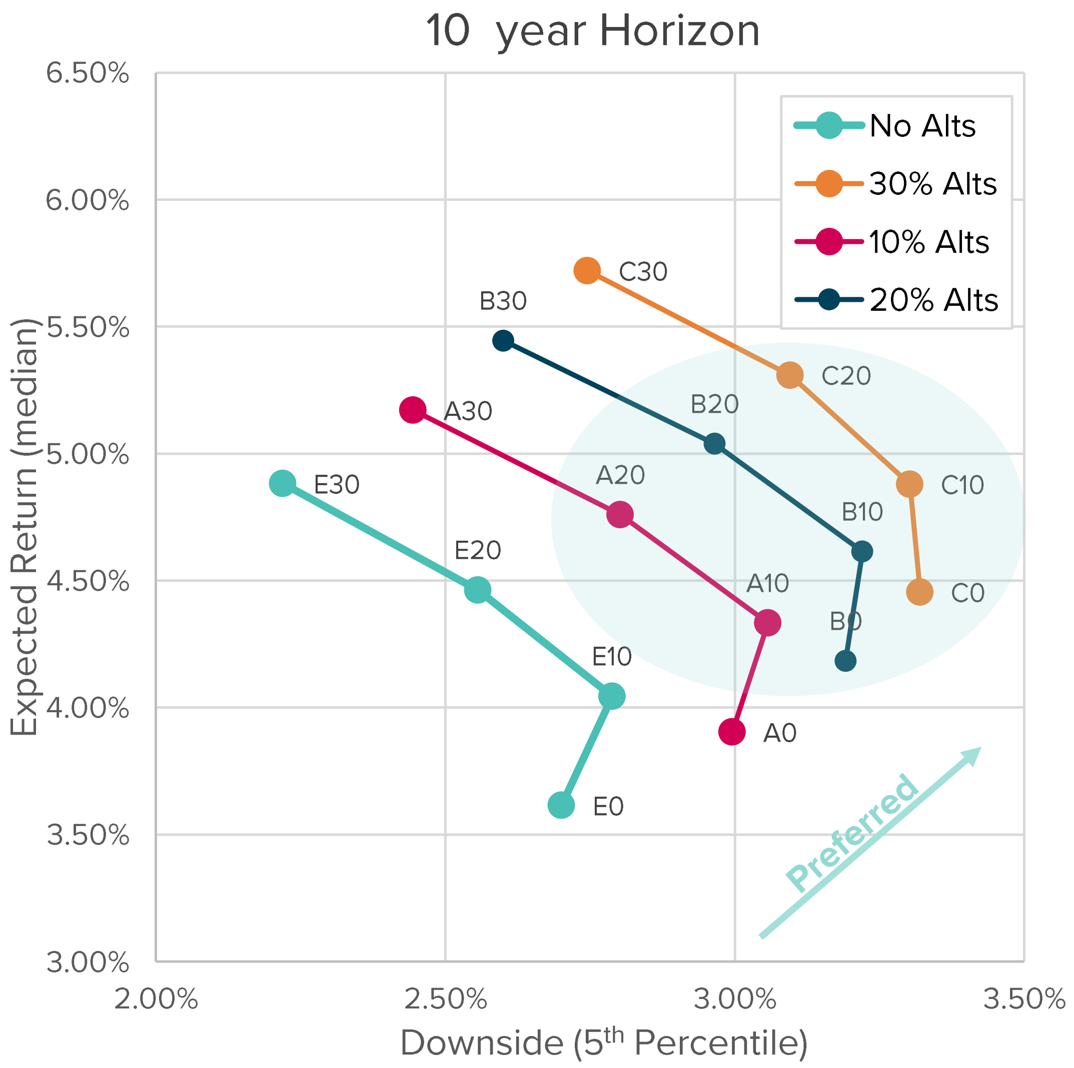
| | Asset Mix | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | E0 | E10 | E20 | E30 | A0 | A10 | A20 | A30 | B0 | B10 | B20 | B30 | C0 | C10 | C20 | C30 |
| Short Bonds | 100.0% | 90.0% | 80.0% | 70.0% | 90.0% | 80.0% | 70.0% | 60.0% | 80.0% | 70.0% | 60.0% | 50.0% | 70.0% | 60.0% | 50.0% | 40.0% |
| **Total Fixed Income** | **100.0%** | **90.0%** | **80.0%** | **70.0%** | **90.0%** | **80.0%** | **70.0%** | **60.0%** | **80.0%** | **70.0%** | **60.0%** | **50.0%** | **70.0%** | **60.0%** | **50.0%** | **40.0%** |
| Canadian Equity | 0.0% | 5.0% | 10.0% | 15.0% | 0.0% | 5.0% | 10.0% | 15.0% | 0.0% | 5.0% | 10.0% | 15.0% | 0.0% | 5.0% | 10.0% | 15.0% |
| Global Equity | 0.0% | 5.0% | 10.0% | 15.0% | 0.0% | 5.0% | 10.0% | 15.0% | 0.0% | 5.0% | 10.0% | 15.0% | 0.0% | 5.0% | 10.0% | 15.0% |
| **Total Equities** | **0.0%** | **10.0%** | **20.0%** | **30.0%** | **0.0%** | **10.0%** | **20.0%** | **30.0%** | **0.0%** | **10.0%** | **20.0%** | **30.0%** | **0.0%** | **10.0%** | **20.0%** | **30.0%** |
| **Total Alternatives** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **10.0%** | **10.0%** | **10.0%** | **10.0%** | **20.0%** | **20.0%** | **20.0%** | **20.0%** | **30.0%** | **30.0%** | **30.0%** | **30.0%** |
| **Total** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** |

- Adding alternatives is expected to materially improve the risk / return profile of the fund by adding additional diversification and taking advantage of the illiquidity premium
- Initial testing has looked at allocations of 10% to 30% to alternatives
- Note: Alternatives are currently modelled based on a typical mix of alternatives - real assets (70%) and private debt (30%)

# Initial results

## Analysis – Median vs. Downside

- Adding alternatives can materially improve the risk / return profile of the fund beyond the results seen when adding only equities
- Over a longer investment horizon, the downside risk can be decreased as alternatives are added into the portfolio



# Initial results
## Analysis – Metrics

| | Annualized Return Statistics | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | E0 | E10 | E20 | E30 | A0 | A10 | A20 | A30 | B0 | B10 | B20 | B30 | C0 | C10 | C20 | C30 |
| Expected Return (10-Year Annualized) | 3.6% | 4.0% | 4.5% | 4.9% | 3.9% | 4.3% | 4.8% | 5.2% | 4.2% | 4.6% | 5.0% | 5.4% | 4.5% | 4.9% | 5.3% | 5.7% |
| Downside Return (10-Year Annualized) | 2.7% | 2.8% | 2.6% | 2.2% | 3.0% | 3.1% | 2.8% | 2.4% | 3.2% | 3.2% | 3.0% | 2.6% | 3.3% | 3.3% | 3.1% | 2.7% |
| Standard Deviation | 2.3% | 2.6% | 3.6% | 4.8% | 2.2% | 2.6% | 3.6% | 4.9% | 2.2% | 2.8% | 3.8% | 5.1% | 2.5% | 3.1% | 4.2% | 5.4% |
| Probability of a Negative Return (Annual) | 4.4% | 3.5% | 9.2% | 15.7% | 1.6% | 2.6% | 8.3% | 15.1% | 1.4% | 3.1% | 8.8% | 14.7% | 1.9% | 4.0% | 10.0% | 15.4% |
| Probability of a Negative Return (10-Year Annualized) | 0.0% | 0.0% | 0.0% | 0.5% | 0.0% | 0.0% | 0.0% | 0.4% | 0.0% | 0.0% | 0.0% | 0.4% | 0.0% | 0.0% | 0.0% | 0.3% |

- Results suggest that the expected return of the aggregate portfolio can be materially increased without increasing the risk relative to the current portfolio
  - For example, the current investment strategy (**E0**) has a similar annual negative return probability as the alternative asset mix **B10** (which includes a 10% allocation to equities and a 10% allocation to alternatives), while mix **B10** is expected to provide a 1.0% higher return annually
- Asset mix **B20** provides materially higher expected returns than the current mix (+1.4% annually), while maintaining a less than 1-in-10 chance of producing a negative return in any single year

# Conclusions

- Adding some allocations to equities and/or alternatives can materially improve the returns generated by the General Fund while still maintaining a lower risk profile

- Ultimately, the asset mix implemented needs to be based on the risk tolerance of the fund

- Further steps will consider:
  1. City constraints on asset classes
  2. Implementation considerations
     - I. Internally managed fixed income portfolio
     - II. Externally managed assets (equities, alternatives)

# Appendix A

## Capital Market Assumptions

# Eckler 2023 Capital Market Assumptions

## Asset class assumptions

### Asset class assumptions

| | Asset Class | Geometric Return 10 Yr | Standard Deviation 10 Yr |
|---|---|---|---|
| | Inflation | 2.3% | 1.5% |
| Fixed Income | Cash/Short Term | 2.8% | 1.5% |
| | Universe Bonds | 3.7% | 4.1% |
| | Short Bonds | 3.6% | 2.3% |
| | Long Bonds | 3.8% | 6.8% |
| | Corporate Bonds | 4.2% | 3.7% |
| | Real Return Bonds | 2.4% | 8.8% |
| | High Yield Bonds | 5.7% | 10.3% |
| | Core Plus Bonds | 4.4% | 3.8% |
| Equities | Canadian Equity | 7.1% | 17.0% |
| | Global Equity | 7.1% | 15.3% |
| | Small Cap Equity | 7.4% | 20.2% |
| | EM Equity | 8.1% | 21.7% |
| Alternatives | Real Estate | 5.5% | 8.1% |
| | Infrastructure | 6.0% | 10.3% |
| | Private Equity | 8.9% | 20.0% |
| | High Yield Private Debt | 6.8% | 10.3% |

# Eckler 2023 Capital Market Assumptions

## Correlations

### 10 year correlations

| | | | 1 | Fixed Income | | | | | | | | Equities | | | | Alternatives | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| | 1 | Inflation | 1.00 | | | | | | | | | | | | | | | | |
| Fixed Income | 2 | Cash/Short Term | 0.40 | 1.00 | | | | | | | | | | | | | | | |
| | 3 | Universe Bonds | 0.01 | 0.19 | 1.00 | | | | | | | | | | | | | | |
| | 4 | Short Bonds | 0.12 | 0.45 | 0.94 | 1.00 | | | | | | | | | | | | | |
| | 5 | Long Bonds | -0.03 | 0.08 | 0.98 | 0.86 | 1.00 | | | | | | | | | | | | |
| | 6 | Corporate Bonds | 0.04 | 0.24 | 0.99 | 0.95 | 0.97 | 1.00 | | | | | | | | | | | |
| | 7 | Real Return Bonds | 0.24 | 0.04 | 0.64 | 0.55 | 0.66 | 0.62 | 1.00 | | | | | | | | | | |
| | 8 | High Yield Bonds | 0.01 | 0.08 | 0.29 | 0.27 | 0.28 | 0.29 | 0.19 | 1.00 | | | | | | | | | |
| | 9 | Core Plus Bonds | 0.04 | 0.24 | 0.93 | 0.89 | 0.90 | 0.93 | 0.59 | 0.59 | 1.00 | | | | | | | | |
| Equities | 10 | Canadian Equity | 0.03 | 0.09 | 0.02 | 0.03 | 0.01 | 0.03 | 0.00 | 0.02 | 0.08 | 1.00 | | | | | | | |
| | 11 | Global Equity | 0.03 | 0.08 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.37 | 0.20 | 0.70 | 1.00 | | | | | | |
| | 12 | Small Cap Equity | 0.03 | 0.06 | 0.01 | 0.02 | 0.00 | 0.01 | 0.00 | 0.38 | 0.20 | 0.74 | 0.88 | 1.00 | | | | | |
| | 13 | EM Equity | 0.05 | 0.12 | -0.11 | -0.08 | -0.12 | -0.10 | -0.08 | 0.24 | 0.05 | 0.59 | 0.76 | 0.76 | 1.00 | | | | |
| Alternatives | 14 | Real Estate | 0.05 | 0.07 | -0.07 | -0.05 | -0.07 | -0.07 | -0.02 | -0.02 | -0.05 | 0.11 | 0.08 | 0.08 | 0.09 | 1.00 | | | |
| | 15 | Infrastructure | 0.02 | 0.05 | -0.15 | -0.13 | -0.15 | -0.15 | -0.09 | 0.70 | 0.14 | 0.07 | 0.43 | 0.45 | 0.38 | 0.05 | 1.00 | | |
| | 16 | Private Equity | 0.03 | 0.08 | 0.01 | 0.02 | 0.00 | 0.02 | 0.00 | 0.33 | 0.19 | 0.83 | 0.94 | 0.90 | 0.78 | 0.09 | 0.39 | 1.00 | |
| | 17 | High Yield Private Debt | 0.01 | 0.05 | 0.06 | 0.06 | 0.07 | 0.06 | 0.05 | 0.93 | 0.40 | 0.01 | 0.37 | 0.38 | 0.27 | 0.00 | 0.74 | 0.33 | 1.00 |

High Correlation
Medium Correlation
Low Correlation

# Disclosures

Outcomes from projections are dependent on the assumptions used.

Differences between projections in the study and actual amounts depend upon the extent to which future experience conforms to the assumptions used.

Actual experience will not conform exactly to the assumptions; projections may be run under alternative assumptions, if desired.

Simulated investment performance results do not reflect actual trading and active management and have certain other inherent limitations.

Actual financial results in future years may not be included among the outcomes presented.

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