2020 Real Estate & Real Return Asset Class Review

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August 20–21, 2020
Agenda

Annual Review Process Introduction

I. Process Part I: Procedural Oversight
II. Process Part II: Outcome Measurement
III. Process Part III: Implementation

Appendix I: Market Update
Introduction: Annual Review Process

Why do we conduct annual reviews?

Per the TMRS IPS, comprehensive reviews are to be conducted and documented at least annually. The goal is to formally review managers’ performance, current investment strategy or style relative to that which was communicated, and other issues related to the managers’ organization, personnel, or investment philosophy. The annual review process is part of the IPS manager retention framework.

The Annual Review process holds TMRS Staff accountable for its portfolio management process in order to preempt manager specific, strategic, or other potential problems.

-- Slide appears annually in conjunction with Real Estate/Real Return Annual Reviews
Introduction: Process Components

Hierarchy of the Decision Process

Procedural Oversight

*Key Inputs*: IPS, Annual Review

Outcome Measurement

*Key Inputs*: Annual Review, Quarterly Report

Implementation

*Key Inputs*: Day to Day, Future Focus

Decision Frequency / Time
Introduction: Process Components

Procedural Oversight → Outcome Measurement → Implementation

What **action & steps** have we taken? Are they adequate?

- Components of the Annual Review
- Compliance Review
- Due Diligence Review

Are **particular ends** achieved consistent with those desired? How might improvement be achieved?

- Capital Allocation
- Diversification
- Portfolio Performance
- Costs
- Manager Assessments

How might **actions and plans** set in motion today positively position TMRS for continued success?

- Future Focus
- Resource Assessment
- Initiatives
The Initiative
Strategic Capital

Decisions Increasingly Outsourced

Direct Investor
Asset Managers
Highly Sophisticated & Resourced Institutions

Strategic Capital
Sophisticated & Highly Resourced Institutions
Separate Accounts, Co-Invest, etc.

Direct Fund
Sophisticated Institutions
Resourced Institutions
TMRS

Fund of Funds
Resource Constrained Institutions

Decisions Increasingly Insourced
Section I

PROCESS PART I: PROCEDURAL OVERSIGHT

• Annual Review Components
• Compliance Review
• Due Diligence Review
Annual Review Components

The internal annual review is designed to ensure matters of compliance and major sources of managerial concern are looked at in depth, complete, and easily reviewable.

The Real Estate & Real Return annual review package averages roughly 800 pgs. annually.
Real Estate
Annual Compliance Review

Sector — TMRS is within sector limitations established. Core exposure is at 66.4% (greater than the 50% minimum limitation), Value-Add exposure at 21.7% (less than 50% limitation) and Opportunistic exposure at 11.9% (less than 25% limitation).

Investment Size — No manager (20% limitation) nor vehicle (15% limitation) violates size limits.

Geography — TMRS is within Geographic Limitations established. Non-US exposure is currently at 7.7%, under the 20% limitation.

Leverage — Portfolio leverage as of Dec. 31, 2019 was 42.9% (41.3% YE 2018, 43.3% YE 2017, 44.1 YE 2016), under the overall portfolio limitation of 65%.

Vintage Year Concentration — TMRS has not breached the 30% concentration limit in any calendar year.

Public Security Limits — TMRS currently holds no separately managed accounts of public securities.

Commercial Mortgage Limitation — TMRS holds no commercial mortgages in separately managed accounts.

Co-Investment — TMRS currently has no real estate co-investments.

Valuation Policy — TMRS’ managers are in compliance with valuation requirements.
Real Return Annual Compliance Review

**Vehicle Concentration Guideline** – TMRS is within guideline limits that no more than 35% of the total net assets of the real return portfolio may be invested in any one Registered Investment Vehicle.

**Closed or Open-end Vehicle Concentration Limit** – TMRS is within guideline limits that no more than 15% of total net assets may be invested in a single Private investment Vehicle.

**Commingled Open-End Concentration Limit** – TMRS is within guideline limits that TMRS can not represent more than 20% of total net assets of a commingled investment vehicle.

**Percentage of Manager AUM Limit** – TMRS does not account for more than 25% of total AUM of any contracted manager’s total AUM.
The Due Diligence Process

2019 Manager Approvals: $850mm (7)
RE – $250mm (3); RA – $600mm (4)

LTM* Manager Approvals: $1,359mm (13)
RE – $1,038mm (10); RA – $321mm (3)

LTM Vehicle Approvals: 19 vehicles
RE – 12 vehicles (1 Secondary); RA – 4 vehicles (1 co-invest)

LTM Successor Funds Approvals: $600mm (6)
RE – $450mm (5); RA – $150mm (1)

LTM Successor Fund “No’s”: 3 Funds

LTM Manager Meetings: 350 Meetings
RE – 195 RA – 155

*Last Twelve Months
Due Diligence
RE/RR Manager Due Diligence File Procedure

Closing File Structure

Fund Investment: Abacus Multi-Family Fund V
(a fund sponsored by Abacus Capital Group)

Approval Summary:
- Search Process Approval: Board of Trustees, Date: December 6, 2018
- Manager Approval: Investment Committee, Date: October 10, 2019
- Board of Trustees, Date: October 31, 2019
- Asset Class: Real Estate
- Vehicle Structure: Limited Partnership, Open-End
- Strategy Classification: Real Estate (Value-Add, Multifamily)
- Approved Investment Amount: $100,000,000
- Additional Information: Present with Madison Realty Debt Fund V.

In-Depth Diligence File Structure

- A - Dataroom & Manager Prepared Materials
- B - Meeting Notes
- C - Comparable Managers
- D - References
- E - Additional Materials

Due Diligence packages take a common form to ensure completeness and organization. However, each due diligence folder typically contains bespoke components based on importance for underwriting that specific strategy and manager.

Countersigned (as applicable) and finalized versions of documents obtained prior to completion of diligence file and transition to permanent filing.
Due Diligence

Initial Contracting & Operational Summary

Contract Negotiation

• Step 1: Business Review
• Step 2: Submission to Legal
• Step 3: External Counsel Review
• Step 4: Business/Lawyer Discussion
• Step 5: Iterative Negotiations
• Step 6: Closing Package Compilation
• Step 7: Closing Letters Submission
• Step 8: Document Execution

Operations

• Step 1: Account Opening
• Step 2: Field Cash Flow Notices
• Step 3: Ensure Contract Signed
• Step 4: Coordinate w/ Custodian
• Step 5: Confirm Wiring Instructions
• Step 6: Initiate Secondary Approvals
• Step 7: Money Wired

Front Office Investment Team interactions with Legal Team and Operational Team are highly structured in order to ensure steps aren’t missed while still enabling timeshare flexibility to focus on more detailed analyses where necessary.
Due Diligence
RE/RR Quarterly Monitoring Procedure

Texas Municipal Retirement System

COMPLETION & REVIEW OF QUARTERLY MONITORING PROCESS

With my signature below, I hereby certify that I have completed the Quarterly Review process pertinent to my department’s area of responsibility. Included in the quarterly review process was as follows:

Quarterly Review Package – 4Q 2019
- TPS Reports
- IPS Compliance Summary
- Consultant Reports:
  - Stepstone
  - ALCourier (Private RE & Liquid RR Reports)

Other Supporting Files Stored
- State Street Final Performance Net All Report
- State Street RE Performance Report
- State Street Private Equity & Private Real Return Performance Report
- RVK Quarterly Performance Report

Quarterly Summary:
- IC Approved Investments: Madison Realty Capital Debt Fund V (2019.10.30)
- Board Approved Investments: All IC Investments approved by Board on 2015.10.31
- Newly Closed Investments: None.
- Terminated Mandates: None.
- Rebalancing Activity: None.
- Outstanding Contracts: Madison V, AMFP V, Berkeley Partner V, Virtus Enhanced Core
- Real Estate Performance: 1.88% vs. BM: 1.31% (QTD); 7.28% vs. BM: 5.59% 1 yr.; 7.28% vs. BM: 5.59% YTD
- Real Return Performance: 1.76% vs. 1.46% (QTD); 15.54% vs. BM: 14.27% 1 yr.; 15.54% vs. BM: 14.27% YTD
- # of Manager Meetings: 34, 68 distinct managers, 43 with non-TMRS contracted managers
- Key Initiatives: Allocation Activity for March; Analyst Training

*Performance noted is representative of RVK reporting. Private fund vehicles are lagged a quarter. More comprehensive performance metrics are prepared and available in the annual review process.

2020.06.29
Investment Director Signature
Date

The quarterly monitoring procedure is designed principally to ensure the investment teams have a structured way to follow what is going on in investment vehicles, to hold team members accountable to the form and function of work product, and to provide a forum for sharing information in a managerial reporting format.
Due Diligence

Search Process & Diligence Progression

Search process, diligence progression and recommendation information culminates in a standardized Investment Committee memo being prepared. This document serves as the centralized basis for recommendation rationale, documentation thereof, and reference for many front, middle and back office functions.

Countersigned (as applicable) and finalized versions of documents obtained prior to completion of diligence file and transition to permanent filing.
Section II

PROCESS PART II: OUTCOME MEASUREMENT

- Capital Allocation
- Diversification
- Portfolio Performance
- Costs
- Manager Assessments
Section II – Process Part II: Outcome Measurement

REAL ESTATE
The TMRS real estate portfolio is nearing a mature state.

Future decisions will center around fee efficiency and portfolio level risk determinations.
TMRS’ portfolio has matured in lock-step with expectations, increasing distributions in every year since the program’s inception.
Real Estate: Diversification Objectives

*Are we as diversified as we want to be? Where is there active risk?*

Manager diversification is within policy limits.

Sector diversification is within policy limits.
Real Estate: Diversification Objectives

Are we as diversified as we want to be? Where is there active risk?

Property type & Geographic Diversification are within policy limits:
Absolute Return

Relative to Benchmark

Relative to Peers

**TMRS:** Was short term positioning good? Was it intentional?

**Manager:** If valid benchmark, good positioning? Intentional?

**TMRS:** Given BM choice, has program been successfully implemented?

**Manager:** If valid benchmark, has strategy been implemented well?

**TMRS:** Has our program design been different from consensus? Have our choices been better or worse?

**Manager:** Do you continue to deserve to be invested with?

N/M – Too many variables, more valid questions pertain to benchmark selection.

N/M – Market Beta Driven

**TMRS:** Is asset class meeting asset allocation objective? Is Benchmark (BM) choice appropriate?

**Manager:** Is manager/strategy meeting a priori expectations?

**Short Term**
# Real Estate: Performance Measurement

<table>
<thead>
<tr>
<th></th>
<th>1 Yr.</th>
<th>Met Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Return</td>
<td>6.6%</td>
<td>✓</td>
</tr>
<tr>
<td>Non-Core Return</td>
<td>7.7%</td>
<td>✓</td>
</tr>
<tr>
<td>Total RE Return</td>
<td>7.0%</td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>3 Yr.</th>
<th>Met Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Return</td>
<td>7.6%</td>
<td>✓</td>
</tr>
<tr>
<td>Non-Core Return</td>
<td>11.7%</td>
<td>✓</td>
</tr>
<tr>
<td>Total RE Return</td>
<td>8.9%</td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>5 Yr.</th>
<th>Met Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Return</td>
<td>9.1%</td>
<td>✓</td>
</tr>
<tr>
<td>Non-Core Return</td>
<td>12.3%</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RE Return</td>
<td>10.1%</td>
<td>✓</td>
</tr>
</tbody>
</table>

After years of favorable returns, the real estate markets have returned to moderate levels.

The TMRS portfolio has continued to outperform the assumed rates of return in the asset allocation model.

Returns have also exceeded CPI + 500 return goal utilized in the IPS.

*Source: Stepstone Q4 2019 Report*
## Real Estate: Performance Measurement

<table>
<thead>
<tr>
<th></th>
<th>1 Yr.</th>
<th>Benchmark</th>
<th>Met Objective</th>
<th>Outperformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Return</td>
<td>6.6%</td>
<td>5.3% - 90 bps fees</td>
<td>✓</td>
<td>216 bps</td>
</tr>
<tr>
<td>Non-Core Return</td>
<td>7.7%</td>
<td>5.3% + Spread</td>
<td>✓</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RE Return</td>
<td>7.0%</td>
<td>5.3% (ODCE Gross)</td>
<td>✓</td>
<td>170 bps</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>Benchmark</th>
<th>Met Objective</th>
<th>Outperformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Return</td>
<td>7.6%</td>
<td>7.1% - 90 bps fees</td>
<td>✓</td>
<td>141 bps p/a</td>
</tr>
<tr>
<td>Non-Core Return</td>
<td>11.7%</td>
<td>7.1% + Spread</td>
<td>✓</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RE Return</td>
<td>8.9%</td>
<td>7.1%</td>
<td>✓</td>
<td>180 bps p/a</td>
</tr>
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</table>

<table>
<thead>
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<th>5 Yr.</th>
<th>Benchmark</th>
<th>Met Objective</th>
<th>Outperformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Return</td>
<td>9.1%</td>
<td>9.0% - 90 bps</td>
<td>✓</td>
<td>103 bps p/a</td>
</tr>
<tr>
<td>Non-Core Return</td>
<td>12.3%</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RE Return</td>
<td>10.1%</td>
<td>9.0%</td>
<td>✓</td>
<td>110 bps p/a</td>
</tr>
</tbody>
</table>

*Source: Stepstone Q4 2019 Report*
Real Estate: Performance Measurement

Real Estate
by AUM & Core Allocation

AUM ($mm)

<table>
<thead>
<tr>
<th>Year</th>
<th>AUM (Avg)</th>
<th>% Core (Avg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TMRS’ Real Estate Portfolio has performed well compared to peers despite our increasing push into lower risk strategies.

*The RVK Public Plan Universe for Real Estate Investors includes approximately 70 plans over the time period measured.
Real Estate: Performance Measurement

*Three Pillars*

### Absolute Return

**N/M**

### Relative to Benchmark

**TMRS:** Was short term positioning good? Was it intentional? **YES, YES**

**Manager:** If valid benchmark, good positioning? Intentional? **YES, YES**

### Relative to Peers

**N/M**

### Short Term

**TMRS:** Has our program design been different from consensus? Have our choices been better or worse?

**Manager:** Do you deserve to be invested with still?

**Questions must always be asked**

### Longer Term

**TMRS:** Is asset class meeting asset allocation objective? Is BM choice appropriate? **YES**

**Manager:** Is manager/strategy meeting a priori expectations? **On Average, YES**

**TMRS:** Given BM choice, has program been successful? **YES**

**Manager:** If valid benchmark, has strategy been implemented well? **On Average, YES**
<table>
<thead>
<tr>
<th></th>
<th>2017 (YE)</th>
<th>2018 (YE)</th>
<th>2019 (YE)</th>
<th>3 Yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Relative Performance ($)</td>
<td>61.7</td>
<td>26.5</td>
<td>45.9</td>
<td>$134.2mm</td>
</tr>
<tr>
<td>Core Relative Performance ($ millions)</td>
<td>27.4</td>
<td>5.1</td>
<td>39.6</td>
<td>$71.2mm</td>
</tr>
<tr>
<td>% of Dollar Relative Value Portfolio Weight</td>
<td>n/m</td>
<td></td>
<td></td>
<td>53.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>68.4%</td>
</tr>
<tr>
<td>Non-Core Relative Performance ($ millions)</td>
<td>34.3</td>
<td>21.4</td>
<td>6.3</td>
<td>$62mm</td>
</tr>
<tr>
<td>% of Dollar Relative Value Portfolio Weights</td>
<td>n/m</td>
<td></td>
<td></td>
<td>46.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31.6%</td>
</tr>
</tbody>
</table>

TMRS Real Estate Portfolio has added about $134.2mm in outperformance over trailing three years, or the equivalent of 6,818 person years of TMRS benefit payments.
Section II – Process Part II: Outcome Measurement

REAL RETURN
Continued real return commitments have moved TMRS toward its targeted asset allocation goals. There is anticipated to be a continued focus on private real return deployment going forward.
TMRS Real Return Portfolio

What we are Invested In

Portfolio Exposure by Manager
Public Markets Detail as of 6/30/2020

- Nuveen: 38%
- Cohen & Steers: 27%
- Public Markets: 35%

Current Private vs. Public Assets
as of 6/30/2020 at target allocation

- Public Assets: 62%
- Private Assets: 38%

Projected Private vs. Public Assets
based on current commitments as of 06/30/2020

- Public Assets: 45%
- Private Assets: 55%

TMRS is well diversified across public markets and private allocations are growing as commitments are drawn.

All charts presented on an adjusted committed basis.
Private investment strategy commitments are drawing down real return public markets exposure.
Portfolio Exposure by Asset Type

as of 3/31/2020

- Global Listed Infrastructure: 16%
- Global Private Infrastructure: 3%
- GILBs: 3%
- Global REITS: 6%
- Private Natural Resources: 21%
- Commodities: 14%
- Listed Natural Resources: 16%
- Short Duration Credits: 5%
- Global Listed Infrastructure: 16%
- Global Private Infrastructure: 3%
- GILBs: 3%
- Global REITS: 6%
- Private Natural Resources: 21%
- Commodities: 14%
- Listed Natural Resources: 16%
- Short Duration Credits: 5%

Portfolio Exposure by Sector

as of 3/31/2020

- Inflation Linked Bonds: 0.25%
- Energy: 14%
- Real Estate: 5%
- Utilities/Renewables: 5%
- Transport/Social Infra: 16%
- Minerals & Mines: 14%
- Agriculture: 15%
- Telecom: 10%
- Other: 14%

TMRS maintains a well diversified portfolio by asset type and sector.

All charts presented on an adjusted committed basis.
TMRS Real Return Portfolio
What we are Invested In

Portfolio Exposure by Geography
as of 03/31/2020

Real Return is a global opportunity set.

TMRS’ real return capital structure is increasingly mirroring the broader portfolio.

Real Return Capital Structure
as of 03/31/2020

All charts presented on an adjusted committed basis.
PERFORMANCE MEASUREMENT

THREE PILLARS

Absolute Return

Relative to Benchmark

Relative to Peers

N/M – Market Beta Driven

**TMRS:** Was short term positioning good? Was it intentional?

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N/M – Too many variables, more valid questions pertain to benchmark selection

**Short Term**

**TMRS:** Has our program design been different from consensus? Have our choices been better or worse?

**Manager:** Do you continue to deserve to be invested with?

**Longer Term**

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**Manager:** Is manager/strategy meeting a priori expectations?
Real Return: Performance Measurement

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<tr>
<th></th>
<th>1 Yr.</th>
<th>Met Objective</th>
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<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>-7.46%</td>
<td>n/a</td>
</tr>
<tr>
<td>Private Mkts. Return</td>
<td>-2.59%</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RR Return</td>
<td>-7.37%</td>
<td>n/a</td>
</tr>
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<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>0.16%</td>
<td>n/a</td>
</tr>
<tr>
<td>Private Mkts. Return</td>
<td>4.9%</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RR Return</td>
<td>0.73%</td>
<td>n/a</td>
</tr>
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<table>
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<th>Met Objective</th>
</tr>
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<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>1.19%</td>
<td>X</td>
</tr>
<tr>
<td>Private Mkts. Return</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RR Return</td>
<td>1.52%</td>
<td>X</td>
</tr>
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An absolute return objective of CPI + 400bps is established as the long term objective of the real return portfolio. Long term being defined as 5 years or greater.

Over the next 12 months it is anticipated that the private portion of the portfolio will surpass 50% of net asset value. The private portfolio will also reach 5 years since inception at TMRS.

Private Markets Returns should increasingly contribute positively to returns through time.

*Source: SSB Q2 2020 Report*
Performance in real return is more volatile on an annual basis than is the asset class goal.

Portfolio objectives are to increase performance from the default portfolio and move toward and eventually beyond our asset class goal.

*Source: Stepstone*
# Real Return: Performance Measurement

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<tr>
<td>Public Mkts. Return</td>
<td>-7.46%</td>
<td>-7.99%</td>
<td>✓</td>
<td>+53 bps</td>
</tr>
<tr>
<td>Private Mkts. Return</td>
<td>-2.59%</td>
<td>n/m or &gt; Public</td>
<td>n/m or ✓</td>
<td>+543 bps</td>
</tr>
<tr>
<td>Total RR Return</td>
<td>-7.37%</td>
<td>-7.40%</td>
<td>✓</td>
<td>+3 bps</td>
</tr>
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<th>Met Benchmark</th>
<th>Outperformance</th>
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<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>0.16%</td>
<td>0.03%</td>
<td>✓</td>
<td>+13 bps</td>
</tr>
<tr>
<td>Private Mkts. Return</td>
<td>4.9%</td>
<td>n/m or &gt; Public</td>
<td>n/m or ✓</td>
<td>+487 bps</td>
</tr>
<tr>
<td>Total RR Return</td>
<td>0.73%</td>
<td>0.78%</td>
<td>X</td>
<td>(5 bps)</td>
</tr>
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<tr>
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<tbody>
<tr>
<td>Public Mkts. Return</td>
<td>1.19%</td>
<td>1.47%</td>
<td>X</td>
<td>(28 bps)</td>
</tr>
<tr>
<td>Private Mkts. Return</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Total RR Return</td>
<td>1.52%</td>
<td>2.02%</td>
<td>X</td>
<td>(49 bps)</td>
</tr>
</tbody>
</table>

*Source: SS8 Q2 2020 Report*
Relative to Peers Analysis at the Plan Sponsor level would typically compare TMRS performance to other public pension plans. There is insufficient data to perform this analysis currently for multiple reasons:

1) There is no reported peer universe for Real Return
2) The asset class is still institutionally nascent
3) Real Return program design is highly heterogeneous

Relative to peers analysis at the manager level are difficult at this stage of portfolio development because private funds are too early in fund life cycles and public mandates are highly heterogeneous.

Relative to peers analysis will become more relevant with time.
Real Return: Performance Measurement

Three Pillars

Absolute Return

Relative to Benchmark

Relative to Peers

N/M

N/M

TMRS: Was short term positioning good? Was it intentional? **Mixed**

Manager: If valid benchmark, good positioning? Intentional? **Mixed**

TMRS: Has our program design been different from consensus? Have our choices been better or worse?

Manager: Do you deserve to be invested with still?

Questions must always be asked

Longer Term

TMRS: Is asset class meeting asset allocation objective? Is BM choice appropriate? **Mixed**

Manager: Is manager/strategy meeting a priori expectations? **Mixed**

TMRS: Given BM choice, has program been successful? **Mixed**

Manager: If valid benchmark, has strategy been implemented well? **Mixed**
Section II – Process Part II: Outcome Measurement

ADDITIONAL OUTCOME DATA
Costs Analysis
What are we Paying for Investment Management Services?

Real Estate:
Total 2019 Management Fees Paid: $29.9mm ($32.1mm in 2018)
2019 Fee % of Wtd. Avg. AUM: 0.93% (1.23%)

Real Return:
Total 2019 Management Fees Paid: $30.8mm ($25.5mm in 2018)
2019 Fee % of Wtd. Avg. AUM: 1.14% (0.86%)

Stable and predictable paths of investment cost have been achieved in the real estate portfolio.

As the private real return portfolio grows, fee burdens and net returns are both expected to rise.
TMRS in the last twelve months is estimated to have negotiated fee discounts of approximately $73.5 million dollars, the equivalent of 3,705 TMRS person years of retirement benefits.

## Costs Analysis

*Are we effective negotiators and executors?*

### Schedule of Investment Cost Savings ($ thousands)

<table>
<thead>
<tr>
<th>Investment Vehicle</th>
<th>Mgt Fee Savings</th>
<th>Incentive Fee Savings</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle A (RE)</td>
<td>281</td>
<td>0</td>
<td>281</td>
</tr>
<tr>
<td>Vehicle B (RE)</td>
<td>375</td>
<td>0</td>
<td>375</td>
</tr>
<tr>
<td>Vehicle C (RE)</td>
<td>1,688</td>
<td>0</td>
<td>1,688</td>
</tr>
<tr>
<td>Vehicle D (RE)</td>
<td>1,375</td>
<td>1,000</td>
<td>2,375</td>
</tr>
<tr>
<td>Vehicle E (RE)</td>
<td>13,954</td>
<td>550</td>
<td>14,504</td>
</tr>
<tr>
<td>Vehicle F (RE)</td>
<td>516</td>
<td>375</td>
<td>891</td>
</tr>
<tr>
<td>Vehicle G (RE)</td>
<td>1,444</td>
<td>0</td>
<td>1,444</td>
</tr>
<tr>
<td>Vehicle H (RE)</td>
<td>2,475</td>
<td>0</td>
<td>2,475</td>
</tr>
<tr>
<td>Vehicle I (RE)</td>
<td>8,373</td>
<td>15,908</td>
<td>24,280</td>
</tr>
<tr>
<td><strong>Total Est. RE Savings</strong></td>
<td><strong>30,480</strong></td>
<td><strong>17,833</strong></td>
<td><strong>48,313</strong></td>
</tr>
<tr>
<td>Vehicle J (RR)</td>
<td>2,750</td>
<td>0</td>
<td>2,750</td>
</tr>
<tr>
<td>Vehicle K (RR)</td>
<td>4,813</td>
<td>7,000</td>
<td>11,813</td>
</tr>
<tr>
<td>Vehicle L (RR)</td>
<td>1,444</td>
<td>0</td>
<td>1,444</td>
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<tr>
<td>Vehicle M (RR)</td>
<td>4,456</td>
<td>3,000</td>
<td>7,456</td>
</tr>
<tr>
<td>Vehicle N (RR)</td>
<td>1,706</td>
<td>0</td>
<td>1,706</td>
</tr>
<tr>
<td><strong>Total Est. RR Savings</strong></td>
<td><strong>15,169</strong></td>
<td><strong>10,000</strong></td>
<td><strong>25,169</strong></td>
</tr>
<tr>
<td><strong>Total Estimated Savings</strong></td>
<td><strong>45,649</strong></td>
<td><strong>27,833</strong></td>
<td><strong>73,481</strong></td>
</tr>
</tbody>
</table>
**Costs Analysis**

How have we had success as negotiators?

---

### Negotiated Cost Discounts by Type

($ thousands)

<table>
<thead>
<tr>
<th>Discount Type</th>
<th>Total Capital Deployed</th>
<th>Fee Discounts</th>
<th>Est. Profits</th>
<th>Discount Rate</th>
<th>% of Total Discounts</th>
<th>% of Capital Deployed</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMRS Directed Structures</td>
<td>87,500</td>
<td>19,269</td>
<td>43,333</td>
<td>44.5%</td>
<td>26%</td>
<td>6%</td>
</tr>
<tr>
<td>Other Strategic Capital</td>
<td>400,000</td>
<td>18,282</td>
<td>148,333</td>
<td>12.3%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Execution/Timing</td>
<td>887,500</td>
<td>31,530</td>
<td>226,667</td>
<td>13.9%</td>
<td>49%</td>
<td>56%</td>
</tr>
<tr>
<td>Scale</td>
<td>887,500</td>
<td>3,547</td>
<td>148,333</td>
<td>2.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consultant</td>
<td>853</td>
<td>853</td>
<td>40,000</td>
<td>2.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Discounted Structures</td>
<td>208,000</td>
<td>0</td>
<td>80,933</td>
<td>0.0%</td>
<td>0%</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,583,000</strong></td>
<td><strong>73,481</strong></td>
<td><strong>687,600</strong></td>
<td><strong>10.7%</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Inclusive of July 1, 2019 - June 30, 2020 Real Estate & Real Return Commitments; estimated over shorter of life of vehicle or 10 yrs.

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TMRS Directed Capital, those structures designed to be most flexible but requiring the most time resources, have disproportionate cost savings benefits to TMRS.
Manager Assessments

Scorecards & Analysis

Summary Data

47 Managers Reviewed

41 ‘In Good Standing’
24 RE; 17 RR; ~96% of RE/RA AUM

2 ‘Fair’
2 RE, 0 RR; ~1% of RE/RA AUM

3 ‘Unsatisfactory’
1 RE; 2 RR; ~3% of RE/RA AUM

1 ‘Comprehensive Review’
1RR; 0% of RE/RA AUM
Manager Redeemed February 2020

<table>
<thead>
<tr>
<th>Assessment Area</th>
<th>Grade</th>
<th>Update &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philosophy/Strategy/Process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portfolio(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
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<td></td>
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<tr>
<td>Compliance</td>
<td></td>
<td></td>
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<tr>
<td>Guideline Changes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section III

PROCESS PART III: IMPLEMENTATION

- Future Focus
- Resources Assessment
- Initiatives
Resource Assessment

Growing Roles of Private Assets & TMRS Directed Investments

Continued deployment into private assets will need to be made to achieve longer term allocation goals.

Real Estate Pacing Model

Cash Flow Model Quarterly Projections
Continued high levels of deployment into private assets will need to be made to achieve longer term allocation goals.

Private Real Return Pacing Model

Source: TMRS Risk Management Department
Based on current as-invested strategy allocations and Investment Department long-term assumptions regarding each strategy.

1. The risk range implied by the IPS Rebalancing Policy includes the ability to allocate 0–10% to Cash.
2. RVK assumptions were updated in June 2020.
Resource Assessment
Growing Roles of Private Assets & TMRS Directed Investments

Private Assets & TMRS Directed Investment strategies are resource intensive.

While addition of new relationships may have already peaked, growth in management line items are expected to continue to grow.

The TMRS RE/RR team currently sits on 54 limited partnership advisory committees and in the last 12 months did 57 person days of travel.
The team is increasingly looking for efficiencies to maintain throughput.
Appendix I

MARKET UPDATE: REAL ESTATE
Leading into the COVID crisis of 2020 real estate returns had already begun compressing.

Source: NCREIF 12/31/2019
Transaction volumes seemed to have reached peak levels globally.

Source: Real Capital Analytics 12/31/2019
Investors spent 2019 investing in larger, riskier funds than in 2018.

Source: Preqin 12/31/2019
Valuations were at cyclical highs at the end of 2019.

Source: NCREIF 12/31/2019
Appendix II

MARKET UPDATE: REAL RETURN
The COVID–Crisis has led to drastic downward swings in inflation globally.

*Data source: Bloomberg
Breakevens provide a snapshot of what the fixed income market is currently predicting for inflation.

*Data source: Bloomberg

Note: Breakevens are the difference in the yield between a nominal and inflation.
The inverse relationship between the USD and commodities continued while gold and oil disconnected from historical correlations.

*Data source: Bloomberg*
DISCLOSURES

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