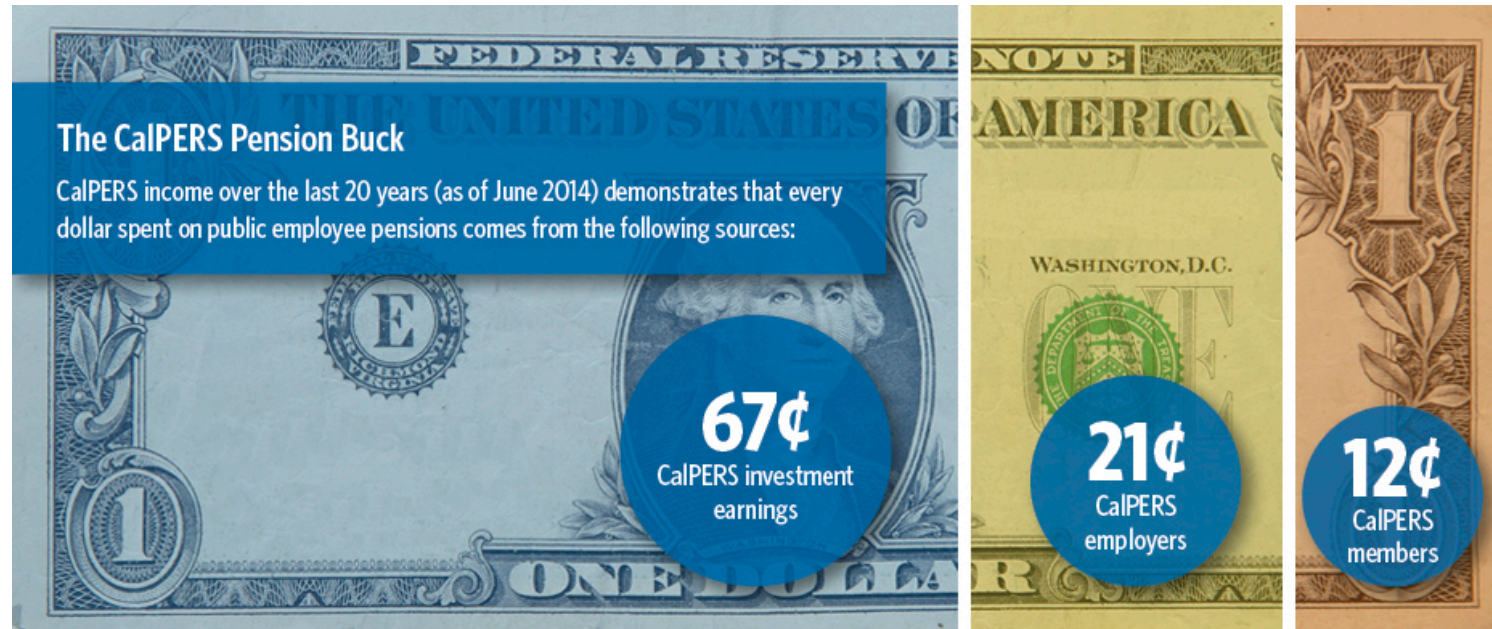


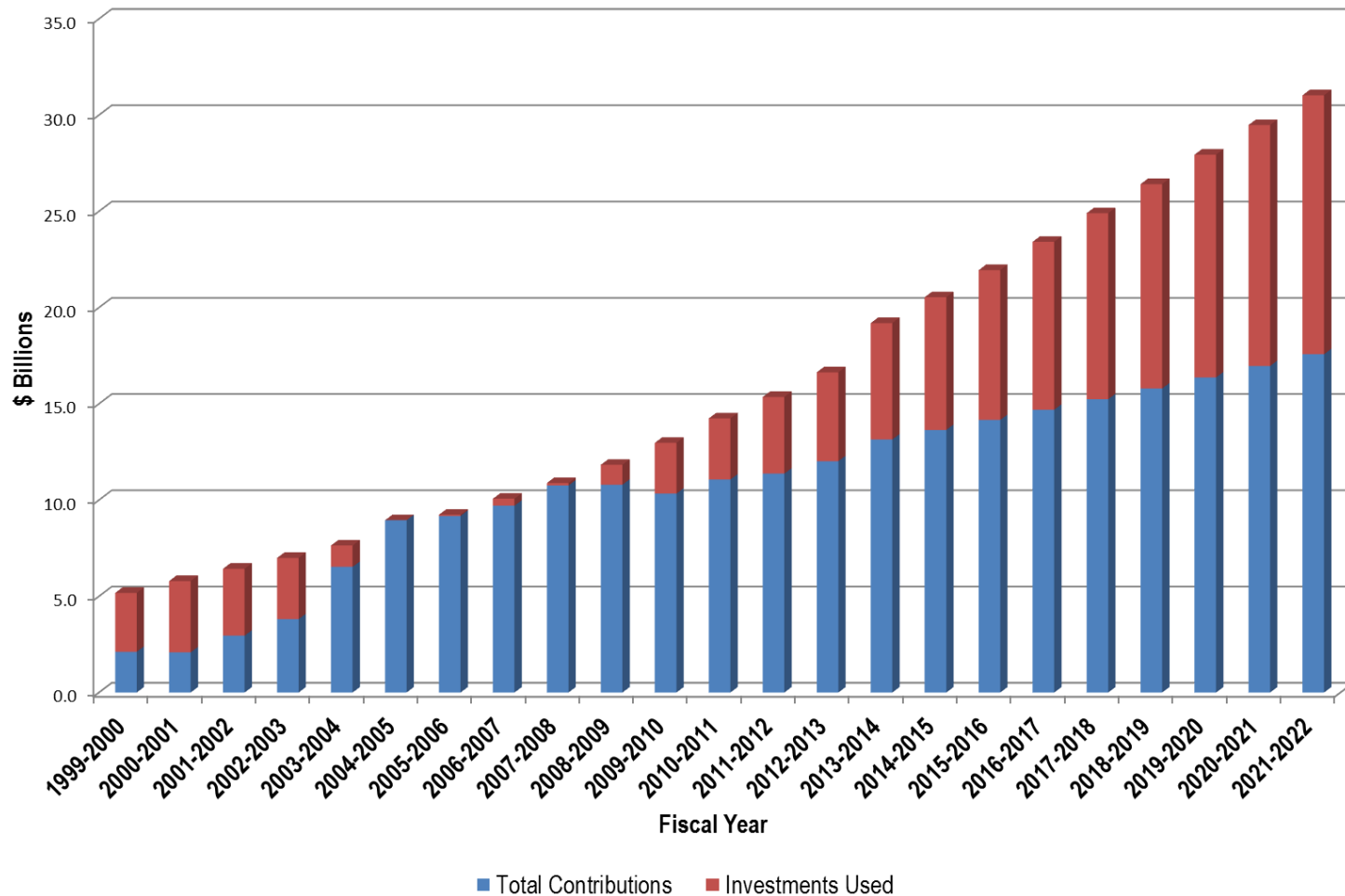
Board of Administration Workshop Treasury Management

January 20, 2015

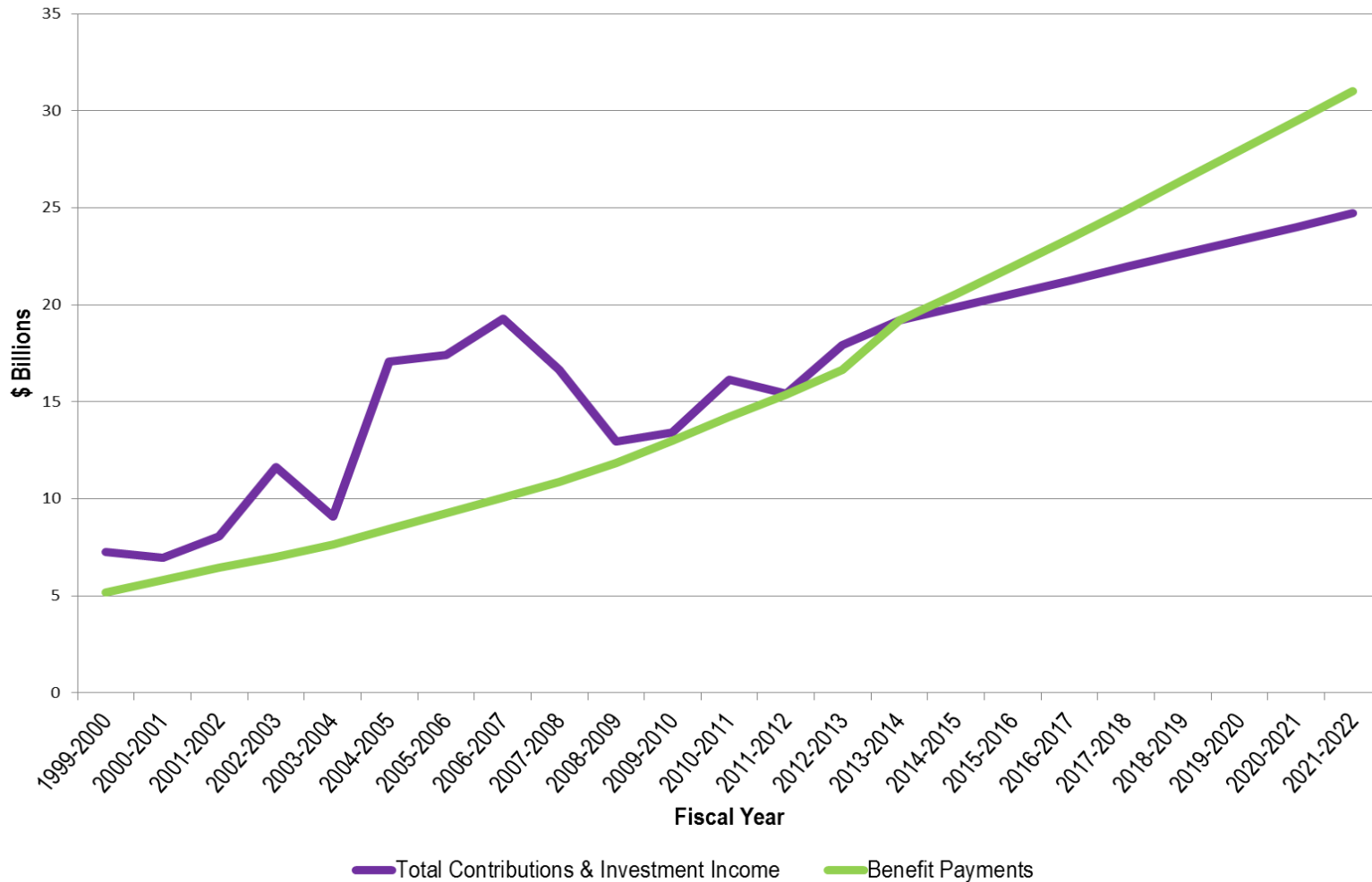
CalPERS Buck



Historic & Projected PERF Contributions & Investments for Benefit Payments

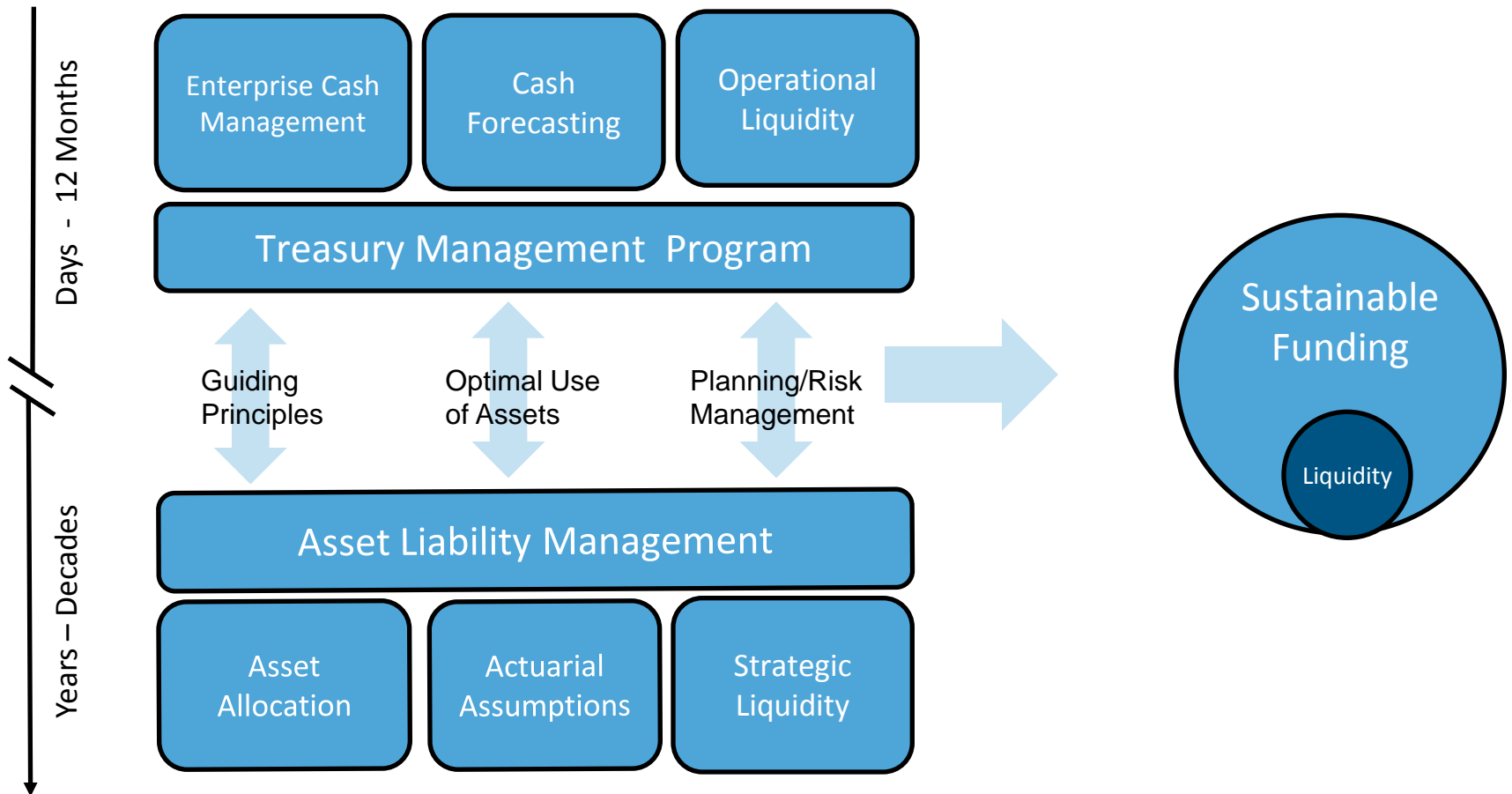


Historic & Projected PERF Cash Flow Analysis



Treasury Management Relative to ALM

The Treasury Management Program aligns with the Asset Liability Management by applying the principles of asset and liability management from a short term perspective.



Workshop Objectives:

- Provide the Board with perspectives and insights related to the treasury management practices of our peers
- Present CalPERS' Treasury Management and provide the Board the opportunity to comment on the core components of the new program
- Present scenarios which highlight the interplay between various liquidity levels and options for funding and provide the Board the opportunity to comment on the strategic direction

Agenda

- Opening Comments
- Peer Perspective on Treasury Management
- Treasury Management Program
 - Principles of Treasury Management
 - Operational Practices
 - Scenarios: Principles and Practices in Motion

Peer Perspective on Treasury Management

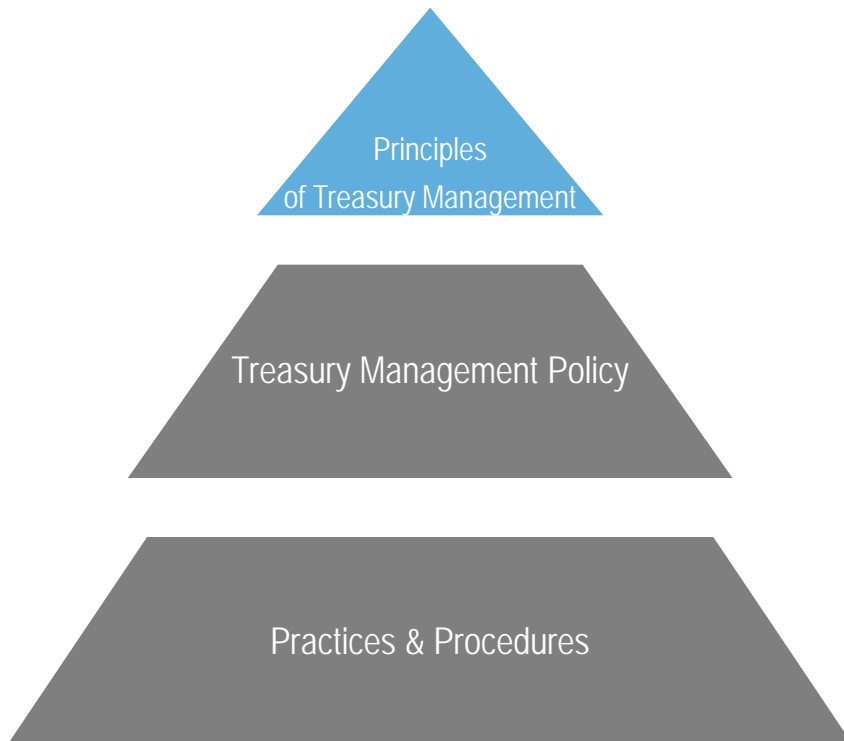
Key Findings:

- ✓ Multiple factors influence cash allocation target selection
- ✓ Use of committees is prevalent, especially with larger pension plans
- ✓ Cash flow forecasting accuracy is challenging, particularly private investments
- ✓ Automation drives confidence in information
- ✓ Many peers are comfortable selling assets to meet obligations

Peer TMP Maturity Level	Limited (25%)	Developing (31%)	Refining (19%)	Maturing (25%)
Attributes of Each Level				
Policy / Contingency Plan	<ul style="list-style-type: none"> Informal practices 	<ul style="list-style-type: none"> Established practices No contingency plan 	<ul style="list-style-type: none"> Some policies Contingency plan 	<ul style="list-style-type: none"> Comprehensive formal policies Formal contingency plan
Structure	<ul style="list-style-type: none"> No dedicated team 	<ul style="list-style-type: none"> Dedicated function 	<ul style="list-style-type: none"> Centralized function Committee 	<ul style="list-style-type: none"> Dedicated treasurer Committee
Liquidity Options	<ul style="list-style-type: none"> Asset sales 	<ul style="list-style-type: none"> Liquidity allocation Asset liquidation hierarchy 	<ul style="list-style-type: none"> Derivatives/Synthetics Limited use LOC 	<ul style="list-style-type: none"> LOC/CP/Repo program "Internal banker" Leverages balance sheet
Level of Automaton	<ul style="list-style-type: none"> Manual 	<ul style="list-style-type: none"> Mostly manual 	<ul style="list-style-type: none"> Semi-automated 	<ul style="list-style-type: none"> Mostly automated
Metrics/KPIs	<ul style="list-style-type: none"> Little to none 	<ul style="list-style-type: none"> Basic metrics <ul style="list-style-type: none"> \$ amount % AUM No stress tests 	<ul style="list-style-type: none"> Expanded metrics <ul style="list-style-type: none"> Coverage ratios VAR Risk reporting Stress tests 	<ul style="list-style-type: none"> Advanced analytics Multiple risk and liquidity metrics Cost of capital analysis Stress testing/scenario analysis

 = CalPERS Current State Treasury Management Functions 10

Treasury Management Program



Principles

- Enterprise scope
- Foundational concepts
- Guide policy, practices and procedures

Policy

- Introduce to Finance and Administration Committee in February
- Strategic objectives
- Roles and responsibilities
- Approach and parameters
- Governance

Practices/Procedures

- Standards and requirements for monitoring and reporting
- Operational workflow for Treasury Office and related activity
- Will vary by group and program

Principles of Treasury Management

Principle #1: Policy and Governance

The CalPERS Board of Administration shall annually review for the approval of the significant policies and strategies related to treasury management.

Principle #2: Management

CalPERS shall have a management structure in place to effectively execute liquidity strategies that ensure Funding to respond to dynamic market and operational environments appropriately and effectively.

Principle #3: Optimization of Assets

CalPERS shall follow a risk based approach to the optimization of fund assets in the payment of CalPERS' obligations to ensure the most cost effective method of Funding is achieved during normal, stressed, and crisis environments.

Principle #4: Measurement and Reporting

CalPERS will utilize a structured approach in the measurement and reporting of the current and future enterprise liquidity based on a detailed understanding of current liquid assets, projected enterprise cash flows, the accuracy of those projections and a consideration of both market-related liquidity risks and external environment events.

Principle #5: Cash Flow Forecasting

Cash flow forecasting represents a fundamental cash management activity that is managed by the Treasury but whose execution may be delegated to line-of-business managers who are responsible for activities that underlie the cash flow information.

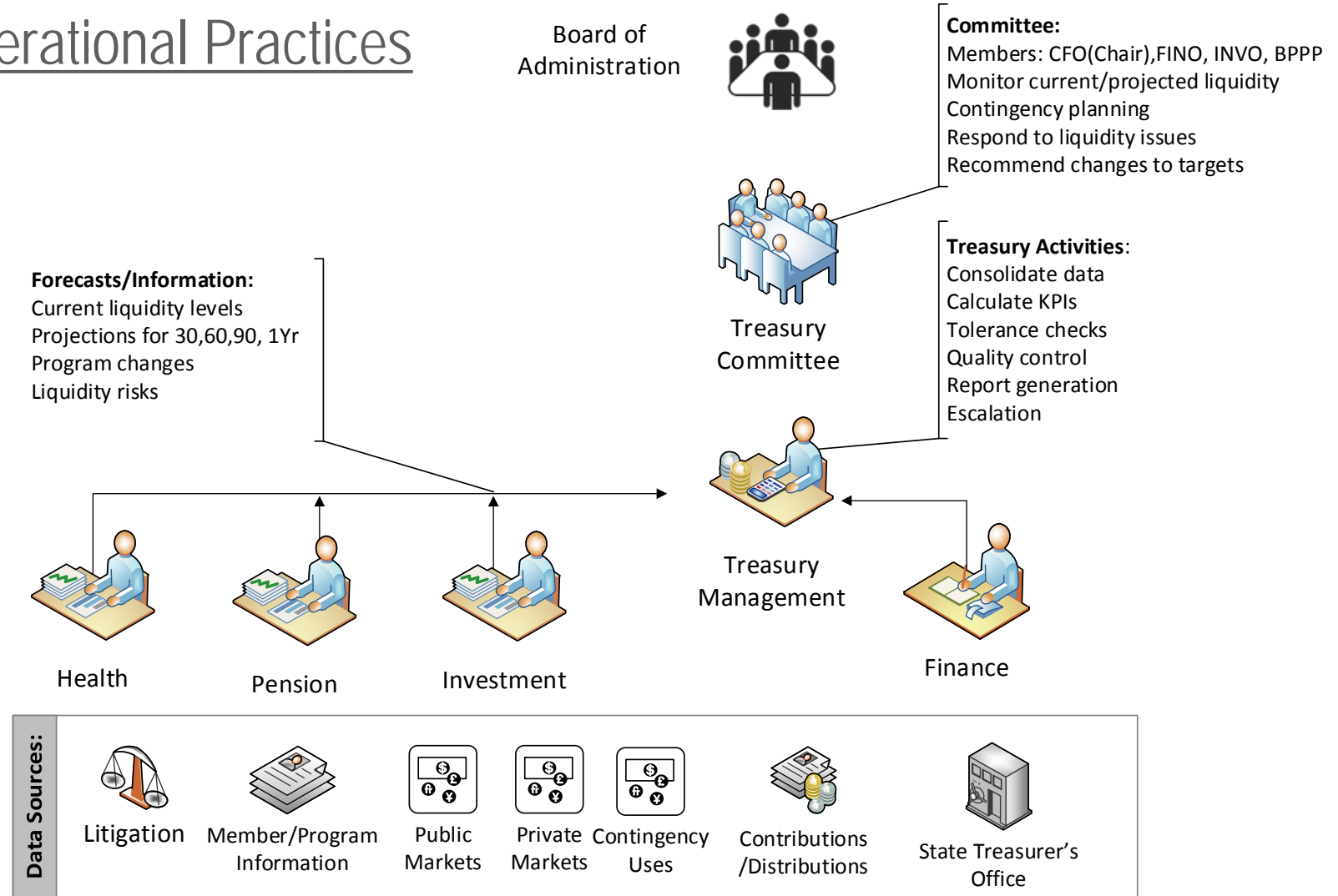
Principle #6: Contingency Planning

Market and external environmental events impacting liquidity are an eventuality for which CalPERS must maintain a plan that describes the enterprise response and protocols during these events.

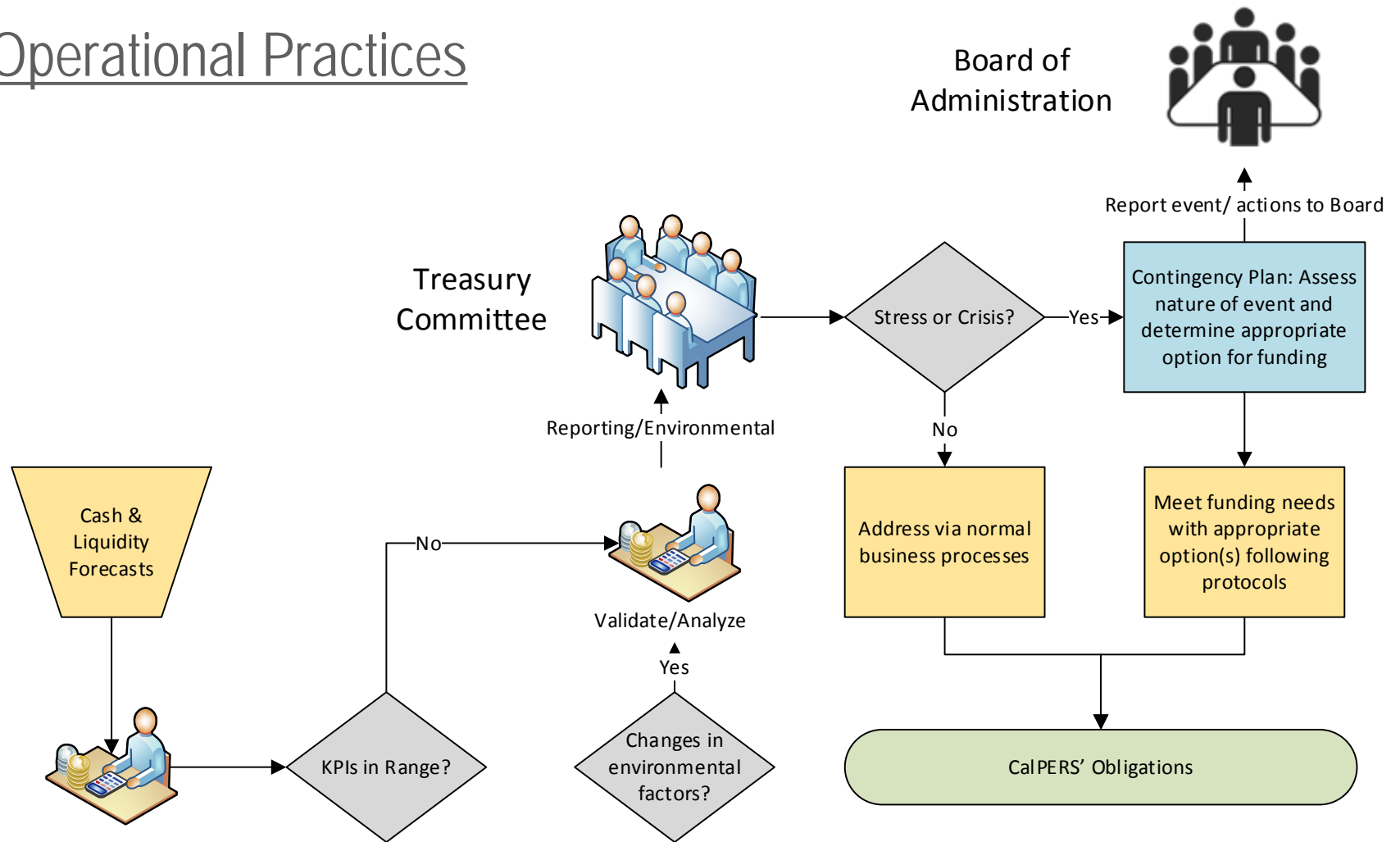
Principle #7: Treasury Resources

Strong processes, skilled staff, and adequate information systems are required for measuring, monitoring, controlling and reporting liquidity positions with respect to Funding.

Operational Practices



Operational Practices



Consolidate & Analyze Data

Scenario - Normal Conditions

In the course of normal Treasury operations

- ✓ Groups report cash positions and forecasts
- ✓ Treasury produce KPIs and analyze data
 - Within range for current and projected liquidity levels?
 - Forecast accuracy meeting standards?
 - Changes in environmental factors?
- ✓ Report KPIs and escalate issues

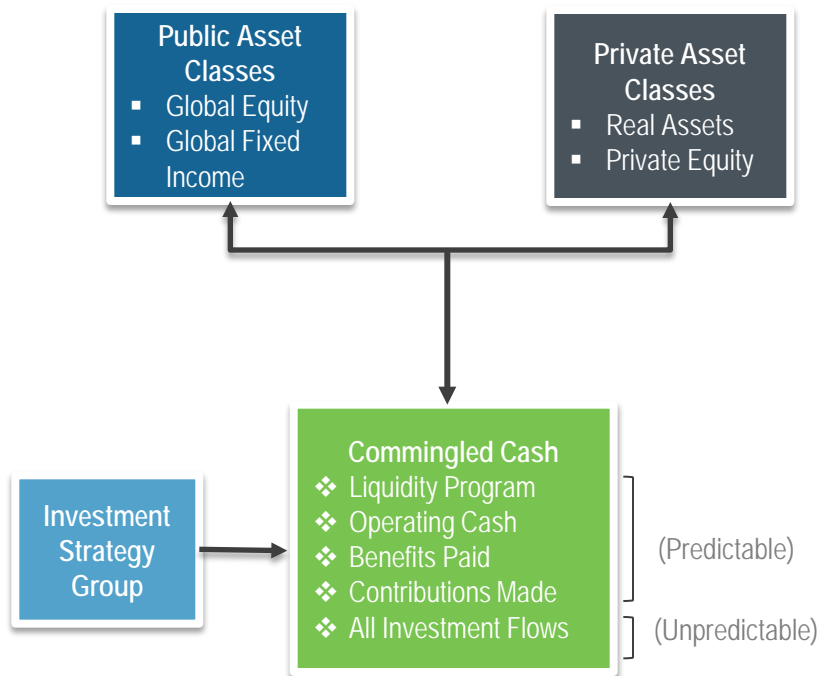
Considerations:

- Comingled cash structures
- Intended use of Liquidity Program assets

Current Conditions:

- Limited treasury management functions
- Commingled cash account structure
- Policy of no leverage
- No alternative funding sources (LOC, CP, etc.)
- 2% target for Liquidity Program allocation

Considerations: Commingled Cash



Current State:

- Private cash flows commingled with all operating cash flows
- Volatility of cash balance requires higher liquidity percentage
- Commingled cash included in Liquidity Program Allocation

Considerations: Liquidity Program

Establishment of CalPERS' Treasury Management creates the opportunity to revisit the objectives and the intended use of the liquidity program.

II. STRATEGIC OBJECTIVE

The LP Programs shall be managed to accomplish the following:

- A. Provide liquid assets that could be converted to cash with little market impact for funding equity oriented ventures during equity market downturns;
- B. Provide a partial hedge to liabilities; and,
- C. Provide diversification benefits.

Source: Statement of Investment Policy for Liquidity Policy

Scenario - Stressed Event

Events occur that bring many or all KPIs close to or outside of the limits of acceptable ranges and/or posing a potential threat to exhaust liquidity pool. Examples include:

- Securities markets liquidity disruption
- Short term contribution interruption
- Litigation – Plaintiff/defendant
- Capital calls for private investment outpace forecasts

Treasury Management Response:

- ✓ Convene Treasury Committee meeting
- ✓ Follow pre-determined cash raise protocols
- ✓ Document event and report to Board in normal course of business

Considerations:

- Contingency Plans and determining the appropriate options for Funding
- Planned v. unplanned sale of assets

Scenario - Crisis Event

Events occur that exhausts or threatens to exhausts all of CalPERS Level 1 and Level 2 liquidity and/or disrupts ability to orderly sale assets to meet obligations. Examples include:

- Extreme dysfunction or shut down of securities markets
- Extreme dysfunction or shut down of banking/custody systems
- Capital calls for private investment greatly outpace forecasts

Treasury Management Response:

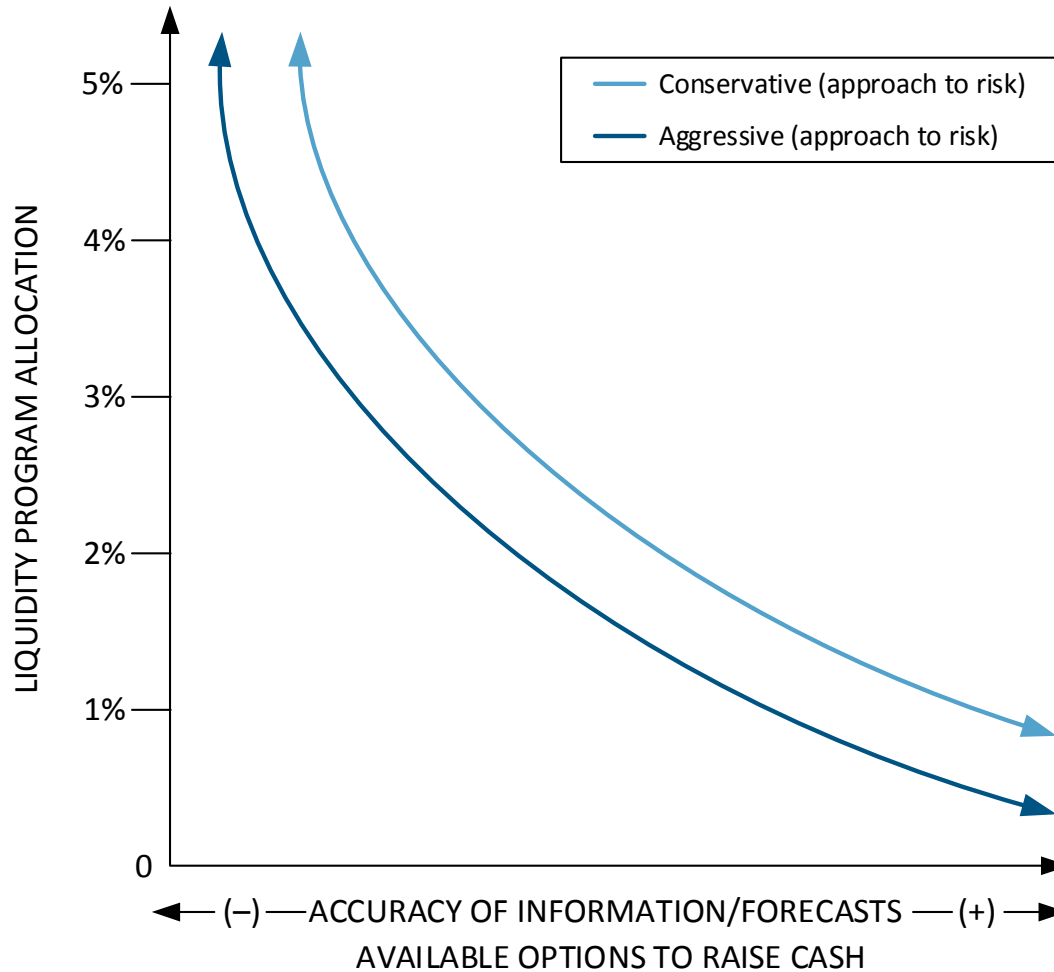
- ✓ Convene TMP Committee meeting – Immediately
- ✓ Execute best available option given circumstances
- ✓ Document event and report to Board as soon as possible

Considerations:

- Exceeding Asset Allocation thresholds during crisis events

Critical Dependencies for Optimization

Interplay of Liquidity, Accurate Information, and Available Options



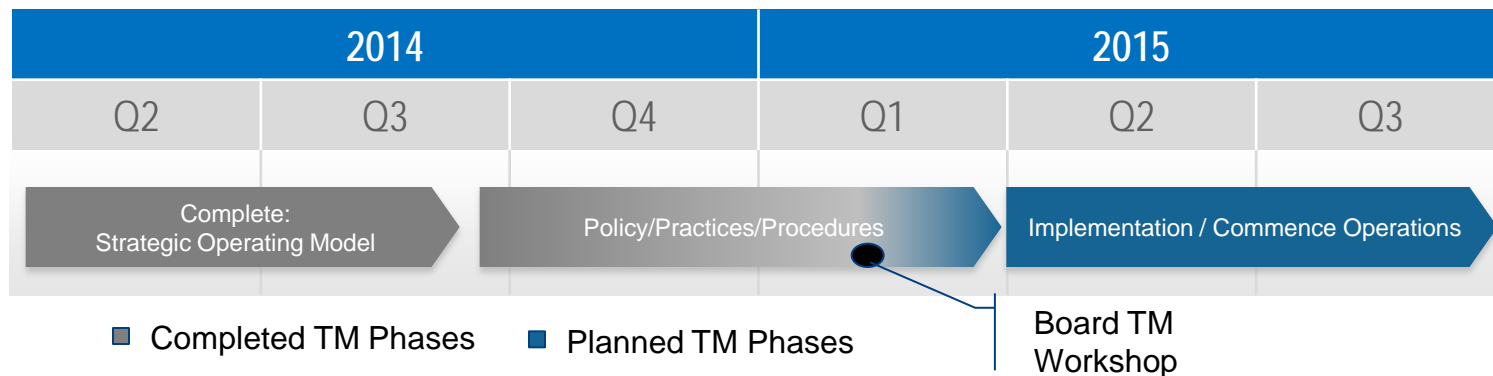
Implementation of Treasury Management Program

Key Steps:

- Treasury Management Policy review for approval
- Training/skill development in place with staff
- Development/implementation of practices and procedures
- Information systems updated for TM requirements

TM Benefits for CalPERS:

- Risks are identified early and mitigated
- Avoid future liquidity problems
- Funding costs minimized
- Facilitates better decision-making
- Strengthen internal controls



Redefine Liquidity Program

II. STRATEGIC OBJECTIVE

The LP Programs shall be managed to accomplish the following:

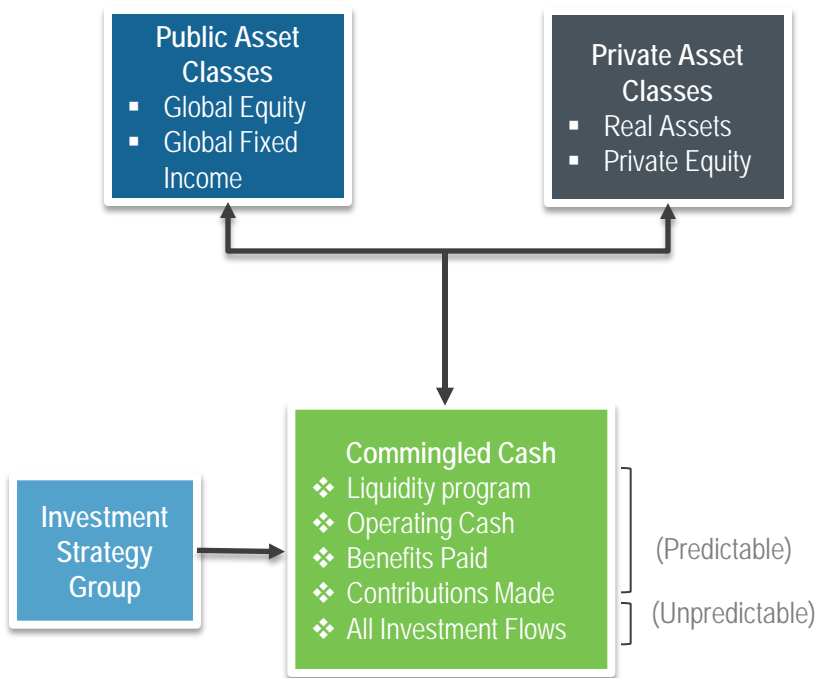
[Refined strategic objectives]

Next Steps:

- Today's discussion on Liquidity Program
- Board guidance and further analysis
- Craft proposed changes for Liquidity Program Policy
- Update Board as appropriate (Information item/action item)

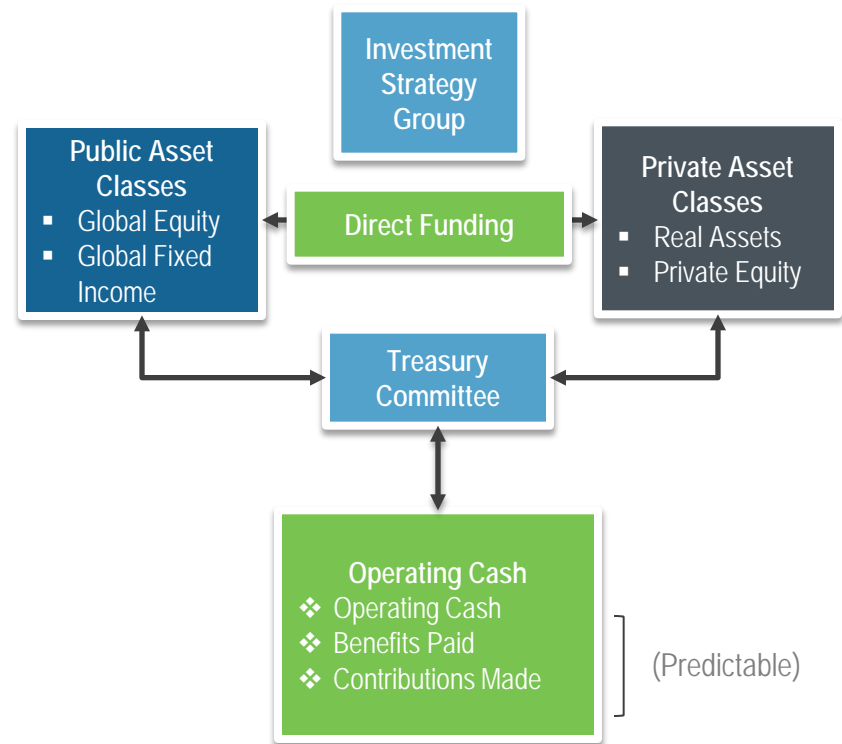
Current State

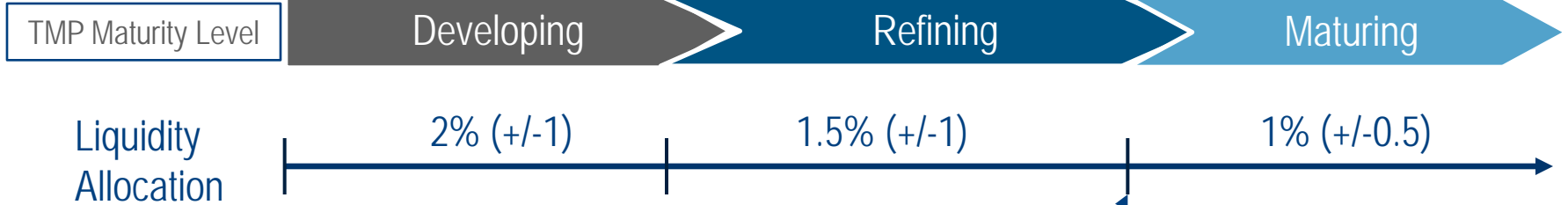
- Private cash flows commingled with all operating cash flows
- Volatility of cash balance requires higher liquidity percentage
- Commingled cash included in Liquidity Program Allocation



Future State

- Private cash flows funded from public asset classes directly
- Operating cash becomes more predictable
- Operating Cash not included as part of Liquidity Allocation





Critical Dependencies to Achieve Lower Liquidity Levels:

- Implement Treasury Management Program
- Redefine the Liquidity Program
- Private cash flows directly funded from public asset classes
- Segregate cash accounts by function