Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

ASRS Investment Initiatives
for implementation in 2019 and 2020 fiscal years

Karl Polen

Arizona State Retirement System

January 2019

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Outline

1. Accomplishments from 2018

2. Asset Classes
   - Equities
   - Interest Rate Sensitive and Credit
   - Real Estate

3. Liquidity and tactical flexibility

4. Risk management
   - Position knowledge
   - Risk framework

5. Data Systems and Analytics

6. Security

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Overall

- Completed new strategic asset allocation

- Began implementation plan process making explicit risk/return targets for asset classes and (when complete) total fund

- Commenced efforts to implement fund level leverage through repo facility and reconfigured equitization program consistent with new SAA

- Completed first direct investment in an operating company (MCR)
  - Hired Fried Frank and Evercore enhancing skills to participate in future direct investments

- Continued efforts to reduce fees and increase control through direct and separate account investments
  - Control features include improved liquidity, targeted investment criteria and shadow underwriting rights

- Renegotiated terms and service model with custody bank and began transition to "EAOS" model

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Credit and Interest Rate Sensitive

- Continued build out of private debt program

- Completed first implementation plan for credit

- Completed first implementation plan for interest rate sensitive

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities

- Completed implementation of factors program

- Terminated all remaining active managers

- Designed and researched alpha overlay strategy

- Completed first implementation plan

- Converted Bridgewater to S&P500 overlay and renegotiated terms

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Real Estate

- Completed first direct investment in operating company
- Continued buildout of separate account program
- Planned for management continuity

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Performance and attribution

- Switched to SS as performance book of record
- Implemented "top down" instead of "bottom up" return calculation method
- Implemented new composites for new SAA (including restatement of history)
- Implemented "dollar value add" approach to attribution
  - allows integration of irr based and twr based returns in same attribution
  - increases clarity of communication of relative importance of return variances

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Data and security

- Commenced use of Github to provide secure storage and version control for computer code

- Hired outsource consultant to commence transition of investment data storage from "flat file" to SQL database

- Collaborate with TSD consultant for planning on cloud transition for enhanced continuous operation capability

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Outcomes

- Through 9/30, returns of x.x% exceeded the benchmark by y.y% placing ASRS in the z percentile among public funds

- Preliminary results for 12/31 are xx.xx% which is yy.yy% greater than the benchmark.

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Finish Alpha Overlay

- The implementation plan preliminarily defined 4 additional components of the alpha overlay

- Need to complete diligence for presentation to asset class committee

- If approved, proceed to implementation

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Event Studies

- The implementation plan identified a series of potential strategies for further enhancement of internal portfolio returns

- These strategies need to be explored and validated through backtest event studies

- Do not currently have the capability to perform this work within the equity team
  - Need to enhance skills or find consultant to assist in the work

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Private Equity Investment Initiatives

- Consider tighter criteria for new investments on more focused approach
- May result in more concentrated portfolios
- Consider overlay to neutralize undesired sector exposures

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Currency

- Consider overlay to neutralize portfolio to ACWI currency weights

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Liquidity/Rebalance

- Consider optimal approach to portfolio implementation providing liquidity on the margin through derivatives to implement portfolio weights and repositioning

- e.g. persistent short position in position in some futures might be accretive to returns and highly flexible to achieve rapid rebalance when desired

- Need to thoroughly examine across all markets

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Beta market review

- Study index and enhanced index market
- Goal is to confirm internal approaches are encompassing best ideas and offer best value

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Private equity tracking

- Implementing a tracking system to monitor sector, currency geography exposures in the private equity portfolio

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Sec Lending optimization

- review sec lending to identify areas for improvement
- potential expansion and coordination of sec lending with liquidity initiatives

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Liquidity Coordination

- portfolio structure and sec lending configuration coordination with liquidity initiatives

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Credit

- Continue buildout of credit portfolio

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Monitoring

- Implement a credit portfolio monitoring system tracking positions and loan quality
- Contract has been signed with Aksia

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Investments

- Continue build out of separate account portfolio
- Continue direct investments in asset managers when available
  - Related fund management under consideration
- Implement direct investment capability in single asset ventures and directly owned property

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Liquidity

- Implement rollup of real estate interests to single entity

- Creates a counterparty for direct investments

- Creates liquidity path for capital markets in debt and equity markets

- Implement credit facilities to decouple capital requirements from other ASRS investments and implement a self sustaining model

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Equities
Interest Rate Sensitive and Credit
Real Estate

Performance measurement

- Implement data enhancements to facilitate decomposition of returns by strategy "levers"
- Possible levers include:
  - Investment structure (direct, separate account, commingled)
  - Life cycle (construction, lease up, reposition, stable)
  - Property type (apartment, office, industrial, retail, other)\
  - Geography

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

SAA framework

- SAA allows up to 5% leverage at total fund level

- May be implemented with borrowed money or synthetically with derivatives

- SAA allows up to 60% leverage for credit and real estate implemented inside those portfolios (with look through to position level leverage)

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Fund Level Leverage

- Investigating repo markets for short term cash borrowing
- Exploring linkage to sec lending, although finding institutional resistance because traditionally managed in different parts of banks
- Leverage can also be implemented with futures, total return swaps, etc

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Asset Class leverage

- For real estate, can implement leverage at roll up portfolio level
- Decouples capital requirements of the portfolio from total fund and makes it independent
- Will explore for credit after proof of concept with real estate

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Optimization of Holding Structure

- Positions can be implemented in cash and derivative markets
- Every method has an implied cost of funding
- Optimization considers the implied cost of funding in structuring portfolios
- For example, could elect to be long R2K and short SP500 futures offset with positions in cash markets as a means of enhancing returns

Credit and Real Estate

- Already have out-source providers in place to provide this information
- RCLCO provides this information for real estate
- Hired Aksia to develop a similar system for credit

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Position knowledge
Risk framework

Private equity

- Plan to evaluate vendors to monitor the private equity portfolio to decompose positions

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Position knowledge
Risk framework

Barra implementation

- Barra has never been fully implemented outside liquid securities
- Private holdings are represented in Barra as liquid proxies without regard to sector, straegy or geography
- Need to develop a capability (presumably outsources) to convert private market position for consumption in the Barra system

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Position knowledge
Risk framework

Barra evaluation

- Once we have the data is entered, evaluate system capabilities to determine utility
- Review competing to determine if something is better suited to our needs

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

EAOS, Middle Office, QC

- Complete implementation of middle office functions with State Street
- Complete implementation of quality control framework
  - State street database of daily positions at account level is reconciled to composites in ASRS database
  - return calculations are replicated and validated top down and bottom up in ASRS database and compared to State
  - decomposition of returns (by levers) reconciles in dollar value space to relevant composite
  - Code for foregoing steps already written and fully automated
  - Once integrity of data established through these checks, hand off to NEPC for their review and confirmation

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Performance Analytics

- Complete "lever" style analysis for all portfolios and total fund
- Complete implementation this analysis on best available daily data

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

SQL database

- Complete transition to SQL database for performance and accountn level holdings data
- Implement a query system in to the database
  - Select account or composite with benchmark or comparison
  - Select data range
  - Select analytical method or comparative analysis (TWR, IRR, PME or DVA)
  - Ability to define on the fly custom composites
  - Ability to grab live index data from BBG if not in policy benchmarks

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Availability

- Working with TSD on cloud implementation to transition "P drive" to cloud
- Already moved code to Github for version control and cloud storage
- Working with vendors to eliminate non-cloud software components in ASRS network architecture (issue for Barra and maybe BBG)
- Considering full virtualization of work stations
- Need mobile solutions for traveling personnel needing connectivity using personal devices

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Integrity

- See quality control steps in section 5
- Implementation of these steps together with SQL implementation provides high level of confidence for data integrity
- Use of github provides version control
- Need to consider implementation of a virtual server environment for access to application code
  - Rstudio connect is a viable product but pipelines to BBG don't exist

Accomplishments from 2018
Asset Classes
Liquidity and tactical flexibility
Risk management
Data Systems and Analytics
Security

Confidentiality

- Working to isolate IMD systems from rest of ASRS in order to implement bespoke information security
- Focus is on M&A information around direct investments
  - investigate industry practice for this type data for possible implementation by ASRS