GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

NEW YORK CITY RETIREMENT SYSTEMS

ACTUARIAL AUDIT AND RELATED REVIEW SERVICES
ADMINISTRATIVE REVIEW REPORT
OCTOBER 28, 2014

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List of Abbreviations

ABS	Annual Benefit Statements
Actuary	A person who is trained in the applications of probability and compound interest to solve problems in business and finance that involve payment of money in the future, contingent upon the occurrence of certain future events
Actuary	Mr. Robert C. North, Jr.
ADS	Annual Disclosure Statement
ASOP	Actuarial Standards of Practice
BERS	Board of Education Retirement System of the City of New York
BOE/DOE	Board of Education/Department of Education
BTDS	Bureau of Technology Development and Systems
CAFR	Comprehensive Annual Financial Report
CD-ROM	Compact Disk-Read Only Memory
CHARMS	City Human Resources Management System
COPS	Comprehensive Officer Pension System
CPMS	Comprehensive Pension Management System
CSD	Certification Services Division
CUNY	City University of New York
DoITT	Department of Information Technology and Telecommunications
DROP	Deferred Retirement Option Plan
EPIS	Employee Payroll Information Systems
FISA	Financial Information Service Agency
FDNY	New York Fire Department
FIRE	New York Fire Department Pension Fund
FTP	File Transfer Protocol
GRM	Government Records Management
GRS	Gabriel, Roeder, Smith & Company
HHC	Health and Hospitals Corporation
ITHP	Increased Take-Home Pay
NYCRS	New York City Retirement Systems (NYCERS, TRS, BERS, POLICE, and FIRE, collectively)
NYCERS	New York City Employees' Retirement System
OA	Office of the Actuary

List of Abbreviations - Concluded	
OLR	Office of Labor Relations
OPA	Office of Payroll Administration
OPEB	Other Post-Employment Benefits
OSC	Office of the State Comptroller
PD	Payroll/Police Department
PDF	Portable Document Format
PMS	Payroll Management System
PO/BO file	Pensioner-Only/Beneficiary-Only File
POLICE	New York City Police Pension Fund
PPMS	Pension Payroll Management System
PROD	Pension Administration System used by NYCERS
ProVal	The current actuarial software used by the OA
Prudential	Prudential Financial, Inc.
QDRO	Qualified Domestic Relations Order
SCA	School Construction Authority
SFTP	Secure File Transfer Protocol
TDA	Tax Deferred Annuity
TRS	Teachers' Retirement System of the City of New York
UPS	Unified Pension System
VPN	Virtual Private Network
VSF	Variable Supplements Fund
VTL	Virtual Tape Library
WTC	World Trade Center

SECTION A

EXECUTIVE SUMMARY AND PROCESS OVERVIEW

EXECUTIVE SUMMARY

Background

Gabriel, Roeder, Smith & Company (GRS) was retained by the Comptroller to serve as Independent Actuary under Section 96 of the New York City Charter and provide other services related to the review of the funding of the following five actuarial pension funds (collectively NYCRS or the Systems):

- New York City Employees' Retirement System (NYCERS)
- Teachers' Retirement System of the City of New York (TRS)
- Board of Education Retirement System of the City of New York (BERS)
- New York City Police Pension Fund (POLICE)
- New York Fire Department Pension Fund (FIRE)

GRS will conduct two consecutive biennial actuarial engagements, encompassing the following:

- Biennial Contribution Audits of the computed employer contributions for each System in NYCRS for fiscal years 2012 and 2014 (including an audit of actuarial accrued liabilities and actuarial valuation of assets);
- Biennial Experience Studies for the periods ending June 30, 2011 and June 30, 2013, for each System in NYCRS;
- Two Administrative Reviews of the data gathering and maintenance practices of the Office of the Actuary (OA) and each System in NYCRS (one review corresponding with each Contribution Audit); and
- Two Independent Actuarial Statements (one for each engagement); GRS, as the independent actuarial auditor, will submit a statement that will briefly describe the scope of the entire engagement, will review the entire engagement and comment on the financial condition and financing progress and policies of each System, and certify that the Systems are being funded on a sound actuarial, financial, and legal basis.

This report constitutes the deliverable with respect to the **Administrative Review** for the first engagement. The purpose of this report is to:

- Review the process of data gathering used in the annual actuarial valuations;
- Review the process of data gathering and transmission of results of benefit calculations/certifications that the OA performs for each of the Systems;
- Review the communications between the OA and each of the Systems related to the above items;
- Review the security of member data that is either stored by the Systems and the OA or transmitted between the Systems and the OA;
- Make recommendations that improve the data collection process, the annual valuations process, and/or improve the security of member data related to storage and/or transmissions by the Systems and the OA.

Our investigation should be considered a Review and not an Audit of administrative procedures. An audit would require more in-depth and detailed exploration of procedures.

The Actuarial Contribution Audit provides an independent verification of the computation of employer pension contributions – including the methodologies used therein and their conformity to laws and generally accepted actuarial principles. The Experience Studies review and comment on the continued appropriateness of the actuarial assumptions used in the computations of employer contributions and identify areas where assumptions may be improved. The Administrative Review evaluates the actuarial data gathering process to ensure that the data collection methods produce sufficiently accurate data for valuation and Experience Study purposes. Thus the three components of the assignment provide assurance that:

- Assets and liabilities are calculated accurately, using appropriate actuarial assumptions and methods, and are based on sufficient and accurate census data; and
- Employer contribution amounts are computed in conformity with all applicable financial, actuarial and statutory requirements.

General Comments

In the course of the Administrative Review, we studied the procedures used by the OA and the Systems for collecting, validating, editing, maintaining and transmitting data for the actuarial valuations, as well as for their disaster recovery plans. In addition, we evaluated the progress made by the OA and the Systems in implementing recommendations from the prior Administrative Reviews.

It was clear to us during the course of the Administrative Review that all Systems as well as the OA have made improvements in procedures and technology and are much more advanced and proficient in data collection and storage since the last audit performed by GRS (approximately 10 years ago). However, since the data collection and storage process is technology based and technology is constantly advancing, there are always additional enhancements that can be made. The recommendations contained in this report center on communications and data elements. While communications between the OA and the Systems appear to be on excellent terms and well-tuned, some of the Systems' staff do not seem to have a clear understanding of how the OA's valuation work directly benefits them and their members (although they see great benefit and value to the Systems in the other work that the OA performs, such as the benefit certifications). In addition, communications between each of the Systems occur on an as needed basis (even though communications between each System and the OA occur more often). We believe regular communications between each of the Systems will greatly enhance the efficiency and security of operations at each System. At the same time the OA should build upon the flow of information between the OA and each of the Systems. For example, more education from the OA about how the valuations and computation of the computed employer contributions benefit the Systems might provide staff with additional incentive in ensuring that the OA has all of the data items needed to better analyze certain aspects of the Systems, such as liabilities associated with part-time members in BERS and service buy-back in all the Systems.

GRS has concluded that the data used by the OA to determine employer pension contributions and develop actuarial assumptions was sufficient and accurate for those purposes.

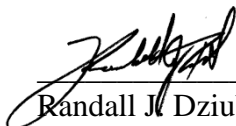This report is divided into the following sections:

We would like to thank the OA and the staff of each of the Systems for hosting our visits, supplying the information on which this study was based and reviewing initial drafts. This report could not have been completed without their assistance. They (all) were accommodating, informative and helpful.

Randall J. Dziubek and James D. Anderson are Members of the American Academy of Actuaries (M.A.A.A) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.
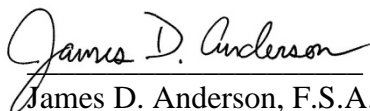
Respectfully Submitted,

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SECTION B

ADMINISTRATIVE REVIEW PROCESS

ADMINISTRATIVE REVIEW PROCESS

Overview

Our primary focus in conducting the Administrative Review was to review administrative procedures used to collect, validate, edit, maintain and transmit data used for the actuarial valuations. Data that is edited for valuation purposes is also used along with edited data from prior years to develop actuarial assumptions in the Experience Study analysis. Thus, by commenting on the integrity of data used for valuation purposes, we are in effect also commenting on the integrity of data used for Experience Study purposes.

In evaluating administrative procedures for data we used two criteria; (1) whether data provided was sufficiently accurate and, (2) whether procedures used were efficient. In analyzing procedures, we brought to bear our knowledge of practices with other public plans, as well as the structure and governance of the OA and the New York City Retirement Systems.

To gain knowledge of current procedures, we studied documents provided by the OA that described the data procedures used by the OA for updating the data used for performing the actuarial valuation for each System. This detailed documentation included data flow, record layouts, target timelines, edit checks conducted by the OA and the estimation of certain data items by the OA that the Systems are unable to provide. We also reviewed prior auditors' Administrative Review Reports, paying special attention to recommendations made by the auditors.

We next met with the OA as well as each of the five Systems. The objective of the meetings was to track the evolution of the procedures used by the OA and the Systems and to identify emerging issues. We wanted to determine whether the procedures used were consistent with current technology and current needs. Review of security and disaster recovery procedures was especially important in this Administrative Review. We also used the meetings to determine the status of implementation of recommendations made by prior auditors. The meetings with the OA and the Systems were done independently (neither was present at the others' meetings). One of the objectives of having independent meetings was to determine the consistency of the information that was provided to us during the meetings. In addition, we believe this gave all parties the opportunity to provide candid and independent responses to our questions.

Prior to each meeting we developed and sent out a detailed list of questions and issues to be discussed at the meeting. The questions covered the following five broad topics: Data Process for Valuation Data, Data Process for Benefit Calculations, Review of Prior Administrative Review, Involvement of outside Vendors with Data, Data Security and Recovery. We also asked about documentation, manuals, and staff member training opportunities at each System. Submitting our questions prior to our meeting allowed for the best use of time at the 3 to 4 hour meetings.

Detail of Process

The Administrative Review began with a meeting in April, 2013 at the OA. During this meeting GRS first met with the Valuation Services Division (VSD) and discussed the process of collecting the valuation data. The overall process was described followed by a specific discussion for each System. Upon completion of the valuation data discussion, GRS met with the OA's benefit certification services division (CSD) to discuss the benefit calculation/certification process and the related transmissions between the Systems and the OA of requests and results.

The agenda for that meeting is shown below:
Administrative Review – Discussion with the OA

I. Overview of OA Mission, Organizational Structure, Staffing, Reporting Relationships, Clients, Work Process
   a. OA repeating tasks (Pension valuations, OPEB valuations, benefit calculations, etc.)
   b. OA non-repeating tasks
   c. Reports published by the OA
   d. OA priorities
   e. Current special, projects (i.e., systems upgrade, conversion to proval, etc.)

   The following for each SYSTEM

II. Data Process for Valuation Data
   a. Where does OA get the data
   b. How does OA get the data
   c. What independent checks are performed to ensure the data is complete (auditing)
   d. What editing is performed to ensure data is correct
   e. What business rules are performed
   f. What happens to records that are determined to be doubtful/defective
   g. How are records tracked from year-to-year
   h. How many parties/agencies (not individuals) are directly or indirectly involved in the process (i.e., OA, FIRE, Payroll, etc.)
   i. How long does the data processing typically take
   j. Documentation from kick-off meeting with System
   k. Documentation on process

III. Data Process for Benefit Calculations
   a. Where does data come from
   b. Is data compared to valuation data
   c. What checks are performed to ensure accuracy of data (if any)
   d. How are results communicated to System
   e. Sample calculations (including 415 testing)

IV.   Review of Prior Administrative Review
     a. Suggestions that have been implemented
     b. Suggestions that have not been implemented
     c. Suggestions that have been rejected

V.   Involvement of Outside Vendors with Data
     a. How many outside vendors receive data
     b. How is it transmitted
     c. How long do vendors keep the data
     d. What security reviews are performed with these vendors

VI.   Data Security and Recovery
     a. How is data kept secure during transmission, working, storage
     b. What security tests are performed
     c. What are the back-up procedures
     d. What are the off-location storage procedures
     e. What testing is routinely performed (restoration from back up; attempted security breaches; disaster recovery of data and of operations (i.e., if the office is shut down, can work continue remotely)

VII.   Documentation or Manuals regarding any of the above

VIII.   Problems faced by the OA on any of the above, Wish List, and Plans for the Future

In January 2014, GRS met with each of the Systems. The agenda for those meetings is shown below (each meeting followed the same agenda). During each meeting GRS had member data for a select group of members valued in the June 30, 2010 valuation. The Systems then looked up those members in their databases to compare the data elements for each member. In addition, GRS also took a tour of the Systems' facilities with a focus on member information security.

NYCRS Administrative Review – Discussion with the Systems

I.   Data Process for Valuation Data
     a. Where does data come from, and how is it entered into System databases
     b. How is data transferred and who is it transferred to
     c. What independent checks are performed to ensure the data is complete (auditing, year-to-year reconciliation, independent sources of information)
     d. What editing is performed to ensure data is correct
     e. What business rules are performed and when are they performed (i.e., when database is entered or after receiving feedback from OA, etc.)
     f. What happens to records that are determined to be doubtful/defective, and how/when are data issues resolved
     g. How are records tracked from year-to-year
        h. How many parties/agencies (not individuals) are directly or indirectly involved in the process (i.e., OA, City department, Payroll, etc.)

      i. How long does the data processing typically take
      j. Is documentation from kick-off meeting with OA sufficient and understandable
      k. Describe on-going communication protocols with OA
      l. What process documentation exists
      m. Wish list – items or issues the System would like to see changed or improved, if any

II. Data Process for Benefit Calculations
      a. Describe benefit application/benefit calculation request process
      b. How is data transferred to OA for calculation requests
      c. What checks are performed to ensure accuracy of data (if any)
      d. How long does it take to get from member initiation of retirement process to benefit finalization
      e. How are results communicated
      f. How is benefit calculation process documented
      g. What calculations are performed internally versus externally (by OA)

III. Review of Prior Administrative Review
      a. Suggestions that have been implemented
      b. Suggestions that have not been implemented
      c. Suggestions that have been rejected

IV. Involvement of Outside Vendors with Data
      a. How many outside vendors receive data
      b. How is it transmitted
      c. How long do vendors keep the data
      d. What security reviews are performed with these vendors

V. Data Security and Recovery
      a. How is data kept secure during transmission, working, storage
      b. What security tests are performed
      c. What are the back-up procedures
      d. What are the off-location storage procedures
      e. What testing is routinely performed -- restoration from back up; attempted security breaches; disaster recovery of data and of operations (i.e., if the office is shut down, can work continue remotely)

VI. Documentation or Manuals regarding any of the above

VII. Staff Member Training, use of Updated Technology

VIII. Sample Employee Record Analysis: Active, Retiree and Terminated Vested Demographic Data

      - Include a sample record of a retiree whose benefit had not been finalized at 6/30/2010
      - Record-keeping of VSF and VSF-DROP recipients/payments (if applicable)

SECTION C

RECOMMENDATIONS

RECOMMENDATIONS

Below is a summary of the recommendations contained in this report along with a discussion of the rationale behind the recommendations:

Recommendations – Comptroller

1. **Explore whether or not there are more efficient approaches to the Administrative Review**

   Each of the Systems undergoes several audits each year. One common theme we heard in our visits was that the Systems were constantly dealing with various audits throughout the year (some of the Systems were hosting other auditors during our visits). We understand that the audits performed on the Systems include:

   - Audits of investments and transactions by Systems' outside auditors;
   - Audits of investments and transactions by the City;
   - Audits of investments and transactions by the State;
   - Security Audits by Systems' internal and external security experts; and
   - Actuarial audit that includes this Administrative Review.

   The Administrative Review contains a review of data used in the actuarial valuation and a review of the security of the Systems' data storage and data transmission. Outside auditors routinely perform data reviews to ensure that the liabilities reported in the Comprehensive Annual Financial Report (CAFR) are based on the appropriate member data.

   The main advantage to the independent actuarial auditor of the Administrative Review is the verification that the valuation data and experience study data is reasonably accurate and complete. There are a number of ways in which the independent actuarial auditor can gather that information in lieu of the current Administrative Review, including:

   - Receiving member data from the Systems and comparing it to the data used by the OA for the valuation (the most common process in actuarial audits);
   - Requesting sample data from the Systems and comparing it to the data used by the OA for the valuation;
   - Collecting member data (in sample form or complete form) from other sources, such as the City, the Systems' auditors, or the City's auditors.

   We therefore recommend that the Comptroller explore whether or not a more efficient approach to the Administrative Review is practical. Such approaches might include:

   - Combining the Administrative Review with one of the other audits, thereby reducing some of the duplicative work and the burden on the Systems;
   - Seeking alternative ways to determine the completeness and accuracy of the valuation data.

2. Consider separating the Contribution Audits from the Experience Study

The Contribution Audits serves to provide the Systems and the City with an independent review of the actuarial valuation. We commend this function and recommend that it be continued. Since this is a service that benefits the City and all of the Systems, we agree that it makes sense that the service be combined for all of the Systems in a single contract and handled by the Comptroller's Office. However, we recommend consideration of separating the Experience Study from the Contribution Audits (we understand this may require law changes). Since the purpose of the Experience Study is to establish assumptions for use in the actuarial valuation by the OA, we believe that it is best if those studies use the same software that is used for the annual valuations at that time. Each valuation system has slight variations on how probabilities are applied. These can include the manner in which ages are rounded, how the probabilities are drawn from the age based tables, how service is rounded to be used to draw a service based probability, how the salary increase timing and decrement timings affect calculations, etc. While most valuation systems can be modified to replicate other systems, it is a more efficient process to use the same system and then start with the actual valuation files, thereby reducing the possibility that technical issues are treated differently between the Experience Study and the Annual Valuation.

Some valuation systems maintain their own databases for use in the experience study module (such as ProVal). This could eliminate the need for the actuarial auditor to maintain a separate experience study database and possibly reduce the work involved in maturing the data. In turn, this would reduce the cost of producing the Experience Study. In addition, this gives the Actuarial Auditor the ability to put more focus on performing an independent review of assumptions and the development of contributions. With the Contribution Audits split from the Experience Study, the Independent Actuarial Auditor could still use different software than the OA to perform the Contribution Audit. This would continue to provide independent verification of the software used in the annual valuation by the OA.

Splitting of these services could be done in different manners. One possibility is that the OA performs all aspects of the Experience Study (either directly or through a vendor hired by the OA) and the Independent Actuarial Auditor performs a review of the Experience Study results as part of the Actuarial Audit of Employer Contributions.

Recommendations – OA

1.   Continue annual kick-off meetings and data requests

The OA has developed an excellent rapport with the Systems through the meetings and data requests. All of the Systems indicated that communications were on excellent terms and they had a full understanding of the data items requested by the OA. We commend the OA for the development and implementation of this process and recommend its continued use.

2.   Provide educational presentations to System Staff

It was clear that communications between the OA and the Systems were on excellent terms and the OA is to be commended for the effort that they have made to create a process that is open, clear and cooperative. However, it was also clear that not all of the Systems' staff view the valuation as a service provided to them. Rather they view the valuation as a service provided to the City/Comptroller that requires their participation. We believe that if the Staff were educated on the value of the actuarial valuations (and resulting funding) to the Systems, then the Staff may be more invested in ensuring that the OA has all of the information it needs to provide the best possible valuation results. We therefore recommend that the OA build upon the excellent communications process it has with the Systems' Staff to let them know that the Systems are the OA's principals for the valuation and the importance of the data in the accuracy of the results. This could be done as part of the annual valuation kick off meeting or during one of the routine follow-up meetings. Educational information should also include general topics, such as how the recent Federal Bankruptcy Court decision that indicated i) federal bankruptcy laws supersede state constitutions and ii) accrued pension benefits can be reduced in municipal bankruptcy regardless of any state constitutional protections, may (or may not) affect the administration and funding of public pension plans across the country.

3.   Fill key open positions at OA

The OA has several key positions open including the Chief Actuary, First Deputy Chief Actuary, one Deputy Chief Actuary and one Assistant Deputy Chief Actuary. We recommend these positions be filled as soon as possible. This will (eventually) alleviate some of the workflow burden on existing staff and reduce some of the deadline stress the OA now faces (or enable more service to be provided). In addition, filling these positions may enable the OA to implement succession planning for the key staff nearing retirement.

4.   **Produce full valuation reports for NYCERS, TRS, and BERS**

Current Actuarial Standards of Practice Statement No. 41 states, in part:

> *3.2 Actuarial Report—The actuary should complete an actuarial report if the actuary intends the actuarial findings to be relied upon by any intended user. The actuary should consider the needs of the intended user in communicating the actuarial findings in the actuarial report.*
>
> *An actuarial report may comprise one or several documents. The report may be in several different formats (such as formal documents produced on word processing, presentation or publishing software, e-mail, paper, or web sites). Where an actuarial report for a specific intended user comprises multiple documents, the actuary should communicate which documents comprise the report.*
>
> *In the actuarial report, the actuary should state the actuarial findings, and identify the methods, procedures, assumptions, and data used by the actuary with sufficient clarity that another actuary qualified in the same practice area could make an objective appraisal of the reasonableness of the actuary's work as presented in the actuarial report.*

The OA does not currently produce formal valuation reports for NYCERS, TRS or BERS. However, the OA has indicated that it produces several different actuarial reports for several different purposes for each of the Systems (such as the appropriations letters, the CAFR letters and the Annual Statement filings to the New York Department of Financial Services), which satisfy this ASOP requirement, even though none is truly a formal valuation report.

Despite producing the various reports, we believe there are still advantages to producing a formal valuation report, such as: memorializing valuation results; providing complete valuation results in one document that can be used by all stakeholders; providing a single document with valuation results for purposes of the actuarial audit, etc. Currently full/formal valuation reports are only produced for POLICE and FIRE. We recommend that the OA produce full/formal valuation reports for NYCERS, TRS, and BERS.

5. **Work with BERS to obtain better credited service information**

The OA does not feel that the credited service currently reported by BERS is representative of actual credited service. In addition, they believe BERS is unable to provide them with adequate information regarding part-time employees (including hourly rate of pay, number of hours that defines full-time status for the current position, portion of full-time status currently working, etc.). We understand that the DOE actually tracks credited service very well and BERS gets the credited service from the DOE when they perform a benefit calculation. However, it was less clear if the DOE had all the necessary information the OA needs to project liabilities for part-time members going forward. Since BERS is in the process of upgrading its database, we think this is a perfect time for the OA to work with BERS to improve the reporting of credited service for valuation purposes. We therefore recommend that BERS, the OA and the DOE continue to work together to see if sufficient information on part-time BERS members can be provided for annual valuations.

6. **Work with NYCERS to determine if the OA can use the service information NYCERS collects for potential service purchases**

The OA has stated that it has an interest in improving the valuation regarding service that has been purchased and service that may be potentially purchased. NYCERS has indicated that they have some information that may assist the OA in developing a service purchase assumption. We recommend that the OA work with NYCERS to determine if this information can be useful to the OA for developing a service purchase assumption or possibly estimating a liability for future service purchases.

RECOMMENDATIONS – **NYCERS**

1. **Share information about the NYCERS paperless office, security, disaster recovery and business continuity programs with the other Systems**

NYCERS is further developed in many of these areas than some of the other Systems and we commend NYCERS for the development of these programs. The sharing of program ideas will benefit the other Systems as they work to improve their programs. We understand that disaster recovery is regularly tested and that NYCERS can make a full recovery in 3 hours or less and become production ready in 4 hours or less. We commend NYCERS for this impressive program.

2. **Reach out to TRS to learn about its employee security education program**

TRS appears to be more advanced in educating its employees on security issues than the other Systems. We believe this is a good program and that the other Systems could benefit from developing similar programs. The program is designed to educate System employees that they are the first defense in maintaining security. We agree.

3. **Involve the OA in the development of the new data management system**

   Data collection is critical to the valuation process. The most efficient process for the annual valuation data collection would be for NYCERS to be the single source of all of the OA's data needs although we understand that this may not be practical. Toward that end, we recommend that NYCERS involve the OA as they develop its new systems to ensure that they are able to easily provide the OA with all the data the OA needs for the annual valuation.

4. **Work with OA and data management to become the single source of data**

   We concur with the prior actuarial auditor that NYCERS should be the single source of data while noting there may be barriers to achieving that goal. Since NYCERS actually performs the benefit calculations (as well as estimates on the annual benefit statements) they should be in possession of all the data necessary to perform the annual valuations. In addition, they routinely go through a data verification process. By using the data from NYCERS, the OA should be able to obtain clean data that reliably contains all the elements necessary to perform the annual valuations. Using NYCERS as the single source of data will also be a more efficient use of the OA's time and resources. We recognize that this is an ideal recommendation and that there may be practical limitations that prevent the implementation of this recommendation. It should also be noted that we are not recommending that the OA cease collecting information from other sources for purposes of cross-checking data received from NYCERS (or any of the other Systems).

5. **Share service purchase information with the OA and work with the OA to determine if this information would be useful to the OA in the development of a service purchase assumption or estimation of potential service purchase liabilities**

   The OA has stated that it has an interest in improving the valuation regarding service that has been purchased and service that may be potentially purchased. NYCERS has indicated that they have some information that may assist the OA in developing a service purchase assumption. We recommend that NYCERS work with the OA to determine if this information can be useful to the OA for developing a service purchase assumption or possibly estimating a liability for future service purchases.

6. **Supply the Increased Take-Home Pay (ITHP) and required employee contributions to the OA.**

   We agree with the prior actuarial auditor that NYCERS should supply this information. We understand that this is in progress as part of the computer upgrade for FY2017.

RECOMMENDATIONS – TRS

1. **Share information about employees security education/training with other Systems**

   TRS had the most evolved employee education (regarding security) of all the Systems. We commend this program and believe that the other Systems could benefit from implementation of similar programs. We recommend that TRS share information regarding this program with the other Systems.

2. **Reach out to NYCERS to gather information on its paperless system/process**

   NYCERS appears to be the most advanced in the move to a paperless environment. TRS is moving in that direction. We recommend that TRS reach out to NYCERS to learn about its paperless system as TRS refines its own system. Since NYCERS is farther along in the process, TRS may glean some valuable information from NYCERS experiences.

3. **Review process of storing boxes of information waiting for transportation to offsite facilities**

   TRS has several policies related to security, including a clean desk policy. The concept behind the clean desk policy is that material that contains sensitive member information be locked up overnight, every night – even if a case file is still in process. This way the information is not exposed on someone's desk when the office is generally empty (or near empty). However, TRS stores boxes of sensitive information in stacks on the floor while the boxes await transportation to offsite storage. We understand these boxes could wait for 2-3 weeks before being transported. This policy would seem to counter any additional security achieved from the clean desk policy. We recommend this policy be reviewed and revised, as appropriate.

4. **Some active member data, such as from CUNY and Charter Schools, are entered into the TRS database manually. TRS should explore secure electronic methods of receiving this data and entering it into the TRS database.**

   We understand this is in progress and recommend continuing to implement this prior recommendation. See implementation review for additional information on current status.

5. **TRS provided on-line benefit certification capability to the OA, but this is not utilized in all cases. TRS and the OA should work on extending this efficient procedure to all benefit certifications.**

   We understand this is in progress and recommend continuing to implement this prior recommendation. See implementation review for additional information on current status.

6. **Some of TRS' technology may no longer be supported by vendors or may become obsolete. TRS should evaluate its technology and make updates if appropriate.**

   We understand this is in progress and recommend continuing to implement this prior recommendation. See implementation review for additional information on current status.

RECOMMENDATIONS – BERS

1. **Develop a formal set of business rules to use in the data verification process**

   BERS seems to lag behind NYCERS, TRS, and POLICE in data verification precision. Since BERS is in the process of developing a new data management system, this is a great time to create a set of formal business verification rules. Currently BERS uses an informal process to compare data in the management system to case files (individual member files). While a formal set of rules may not result in better data verification, it will aid in the training of new BERS staff and ensure that the current data verification standard continues to be met when new (inexperienced) staff are hired or promoted. BERS does not concur that the development of formal business rules will improve its data verification precision. BERS believes that the reason they lag behind the other Systems is related to the use of antiquated and multiple data sources. They further believe that this will be addressed with the development of CPMS.

2. **Work with DOE to improve credited service reporting for the annual valuation**

   BERS benefits are based on actual service earned and annualized pay. However, the OA currently does not believe the reported service on the valuation data is reliable. In addition, the OA would like to receive additional information including hourly rate of pay, number of hours that defines full time status for the current position, portion of full-time status currently working, etc. In the absence of receiving complete part-time information, the OA values benefits based on annualized service and reported pay. Valuation results would be greatly improved if the OA could base the valuation on the same process used to compute benefits. Since the DOE is believed to have this data, we recommend that BERS work with the DOE (and the OA, as necessary) to capture this data for the annual valuation data file.

3. **Involve the OA in the development of the new administration system**

   Data collection is critical to the valuation process. The most efficient process for the annual valuation data collection would be for BERS to be the single source of all of the OA's data needs. Toward that end, we recommend that BERS involve the OA as BERS develops its new systems to ensure that they are able to easily provide the OA with all the data the OA needs for the annual valuation. We understand that BERS has included a representative of the OA on the Steering Committee for the project and is committed to ensuring the OA is included on all the development specifications that involve input to or output from the OA.

4. **Review NYCERS, TRS, and POLICE programs and policies on paperless office, security, disaster recovery and business continuity**

   BERS lags behind these other systems in these areas (but is ahead of FIRE). Each of the other systems has a standout policy or program in one of these areas. We believe that BERS will therefore benefit from the other Systems' experience in the development of its own programs/policies.

5. **Share the Administrative Review Report with staff**

   Staff indicated that they had never seen the prior Actuarial Auditor's Administrative Review Report. We recommend this report be shared with staff so that BERS can evaluate and implement the recommendations contained herein. After the draft Administrative Review Report was circulated, staff indicated that the hard copy of the final Administrative Review Report is routinely made available to all staff interested in reviewing it.

6. **There is no specific documentation of BERS' process to provide active member data to the OA. BERS should document its active data process in writing.**

   We understand this is in process with the development of CPMS and recommend continuing to implement this recommendation. See implementation review for additional information on current status.

7. **BERS does not supply ITHP and required employee contribution data to the OA for the valuation. The OA and BERS should determine whether this data is reliable, and if so, the data should be provided to the OA. When BERS' computer system is upgraded, this data should be included in the database and provided to the OA.**

   We understand this is in process with the development of CPMS and recommend continuing to implement this recommendation. See implementation review for additional information on current status.

8. **BERS does not supply full-time employees' service and part-time employees' hours to the OA for the valuation. The OA and BERS should work together to validate this data, and if valid, it should be provided to the OA.**

   We understand this is in process with the development of CPMS and recommend continuing to implement this recommendation. See implementation review for additional information on current status.

9. **The active valuation data process depends too heavily on the involvement of Prudential. BERS should complete the effort to replace the Prudential data system. The OA should be consulted on the data elements to be included in the new system, and should be given access to the new system for benefit certification purposes. An outside vendor should be engaged to provide data back-ups and business continuity protection services.**

We understand this is in process with the development of CPMS and recommend continuing to implement this recommendation. See implementation review for additional information on current status.

10. **Given the current data system arrangement, efficiency and data security can be improved.**

We understand this is in process with the development of CPMS and recommend continuing to implement this recommendation. See implementation review for additional information on current status.

RECOMMENDATIONS – POLICE

1. **Review NYCERS policies/program regarding a paperless office**

NYCERS appears to have made the most progress on becoming a paperless office. POLICE have indicated that becoming a paperless office is on their wish list. We concur that POLICE should move in this direction. We recommend that POLICE review the NYCERS program/policies as they continue progress toward becoming paperless.

2. **Continue to move World Trade Center (WTC) Election Data into COPS**

This data is important for the OA in the valuation process. The election data indicates which WTC eligible members have made the appropriate election to maintain eligibility for WTC benefits in the event of a future disability. Currently, the OA estimates liabilities based on aggregate estimations. In addition, the OA has established different probabilities for certain benefits based on WTC eligibility. Getting accurate election information to the OA will enhance the accuracy of the valuations. We therefore recommend that moving election data into COPS be completed as soon as possible so that POLICE can give the OA this information seamlessly with the rest of the valuation data.

3. **Integrate Tier III into COPS**

We understand POLICE is in the process of integrating Tier III into COPS. As more members are hired into this tier, this will become more important. We recommend this be completed as soon as possible.

4. **Hire additional staff**

    We understand that POLICE anticipate a heavier than normal volume of retirement calculations in the near term. Not only is there a large class becoming eligible, but there will be a number of recalculations needed once contracts are settled (expected to be soon due to the election of the new mayor). In all, once labor contracts are settled, POLICE will have at least 4,500 retirement benefits to finalize and get certified by the OA. POLICE should consider hiring additional staff to handle the additional workload.

5. **Fix member account balances**

    In the June 30, 2010 valuation data, reported required ITHP balances were inconsistent with prior and subsequent reporting. The OA identified this and established an aggregate liability adjustment to account for the incorrect reporting. We queried the total balances for all POLICE members as of June 30, 2009, June 30, 2010, and June 30, 2011. Those balances are shown below:

| June 30, | $Millions | | | | | | Active Count |
| | ASF | | ITHP | | | | |
	Actual	Required	Actual	Required			
2009	$ 1,913.6	$ 1,385.9	$ 1,844.3	$ 1,745.5			35,589
2010	$ 2,105.1	$ 1,413.9	$ 2,054.9	$ 2,795.0			34,219
2011	$ 2,214.7	$ 1,373.0	$ 3,156.0	$ 3,014.2			32,205

    As the table shows, June 30, 2010 is the only year where the required ITHP balance is greater than the actual ITHP balance, in total. Although a review of the June 30, 2011 balance was not within the scope of our engagement, in looking at the table above, it does appear that there may be a problem with the reported required ASF balance in that year's data. That is the only year where the required ASF balance decreases. However, the actual ASF balance still increases. We recommend these balances be reviewed as well.

6. **World Trade Center election data should reside in COPS and World Trade Center data should include an indication of whether, and when, members reclassify their status to World Trade Center accidental disability.**

    We understand this is in process and recommend a continuation of this implementation. See implementation review for additional information on current status.

7. **POLICE should continue to look for ways to streamline report creation by COPS.**

    We understand this to be an ongoing process for POLICE and recommend a continuation of this implementation.

RECOMMENDATIONS – **FIRE**

1. **Provide corpus funding for FIRE**

   The one area that FIRE excelled at was security for access to the perimeter of the building and building access. FIRE lags behind all the other systems in almost every other area. FIRE needs to enhance its data management system, move toward a paperless office, invest in disaster recovery equipment and ensure staffing that is sufficient to meet all of its needs. Budgetary restrictions have held back FIRE's progress in these areas. The other Systems have modernized operationally, technologically, and physically after corpus funding was provided to them. Accordingly, we recommend that corpus funding be provided for FIRE. If corpus funding is achieved, FIRE will be better able to make progress on the outstanding issues from prior reviews.

2. **World Trade Center election and buy-back service data reside in data files which are separate from FIRE's main database. These data items should reside in FIRE's main database. World Trade Center data should include an indication of whether, and when, members reclassify their status to World Trade Center accidental disability.**

   We understand this is difficult to implement due to the changing/evolving laws. However, we agree with the prior actuarial auditor that implementation would be beneficial. We recommend an implementation based on current law.

3. **The OA should be given access to actual member data for benefit certification purposes.**

   We concur with this recommendation from the prior actuarial auditor.

4. **Data security can be improved.**

   We understand this is an ongoing process and recommend continuing to monitor and update.

RECOMMENDATIONS – ALL SYSTEMS

1. **Create a regular schedule where the Systems' staff can get together and share ideas**

    Many of the Systems face similar challenges related to security, disaster recovery, data management and member services. Although the Systems' staffs talk with each other on an "as needed" basis, we believe that each of the Systems would benefit from a more formal and regular meeting to share ideas, such as annually or biannually.   This could reduce duplication of effort and lead to quicker implementations (for the Systems that are not first to implement), since they will have the benefit of learning from the other Systems' research, successes and failures.

SECTION D

IMPLEMENTATION REVIEW

IMPLEMENTATION REVIEW

The most recent Administrative Reviews were completed in December 2011 by Hay Group, Inc. We present below the status of the major recommendations made by Hay Group along with brief comments from GRS. It is important to note that the Systems and/or the OA may not agree with every recommendation.

Status of Prior Recommendations – NYCERS

1. The valuation data collection process can be improved. Hay recommended that NYCERS: (a) be the single source of the data; (b) work with the OA to ensure that the updated computer system can provide the data elements needed by the OA for the valuation; (c) flag data changes for the OA so that the OA does not need to question the changes when performing its data analysis; and, (d) provide the OA with a year-over-year data reconciliation as a validity check of the data.

   Status: No progress. OA continues to own the valuation data process, collecting data from several sources to prepare preliminary valuation data files to give to NYCERS. NYCERS plans to resume efforts in determining its options for a pension system replacement in FY 2017. We concur with the Hay recommendation.

2. Data issues found in the annual data process which are not easily resolved are deferred for resolution until the following valuation.

   Status: Completed. Material items are now resolved promptly.

3. Ongoing valuation data issues with respect to member service and members with multiple member numbers should be completed as soon as possible.

   Status: Substantially completed. NYCERS has an automatic update process that generates year end service.

4. NYCERS should document its active member data process in writing.

   Status: Completed. NYCERS has created flowcharts documenting processes.

5. NYCERS does not supply Increased Take-Home Pay (ITHP) and required employee contribution data to the OA for the valuation. When NYCERS' computer system is upgraded, this data should be included in the database and provided to the OA.

   Status: In progress. This information is not carried on NYCERS' files, computer upgrade scheduled for FY 2017.

6. NYCERS should include a notation on the active member data provided to the OA, indicating that members have bought back service, and showing the amount of service bought back.

   Status: Completed. This information has been provided at the OA's request.

7.   NYCERS should check items relating to entry age, date of birth and date of hire, etc. prior to sending the data to the OA.

        Status: Completed. This is addressed during data process.

8.   Sending paper files to the OA for benefit certification purposes is inefficient and poses a data security risk. These files should be sent electronically to the OA via a secure link.

        Status: No longer applicable. NYCERS does not send paper files. However, the OA sends benefit certifications to NYCERS on paper. NYCERS would prefer electronic transmission of this data, but this is the OA's choice.

9.   NYCERS should prepare and maintain a written manual that documents the benefit calculation process.

        Status: Completed. A procedure manual has been created.

10.   When sending retiree payroll data to PPMS, NYCERS does not identify retirees whose pension benefits have not been finalized due to labor contract negotiations that have not been settled. NYCERS should flag this information for the OA.

        Status: Partially resolved. NYCERS has completed this to the extent that they can. NYCERS does not have bargaining unit codes. They have built a title code table. This is only part of the information needed, but it is all they have.

11.   NYCERS transfers active member data to the OA on compact disc. This is both inefficient and a data security risk. As indicated above, a secure electronic link should be established between NYCERS and the OA for the purpose of transmitting member data.

        Status: Resolved – files are sent through secure link.

12.   NYCERS instituted a pilot program to cross-train staff members across various functions. This initiative should be continued.

        Status: Resolved. This program has continued.

13.   NYCERS learns of pensioner deaths by direct notification from the beneficiary, and from Social Security death sweeps. NYCERS should investigate more comprehensive methods of checking for pensioner deaths.

        Status: No longer applicable. NYCERS has investigated the availability of death data from several sources such as various private vendors and the New York State and City Health Departments. These entities do not provide data beyond what is being provided by the Social Security Administration. NYCERS sends affidavits annually to pensioners 87 years of age and older to verify each pensioner's continuing eligibility for their pension benefits. Deaths are detected through this process. GRS believes the current process is sufficient.

Status of Prior Recommendations – TRS

1. Some active member data, such as from CUNY and Charter Schools, are entered into the TRS database manually. TRS should explore secure electronic methods of receiving this data and entering it into the TRS database.

    Status: In progress. CUNY payroll is automated but employment information is not – TRS is pursuing an automated feed. CUNY is not sure that historical data is 100% reliable. Charter Schools provide automated data feed that is reviewed by TRS.

2. Historically, Charter School data has not been delivered to the OA on a timely basis for the valuation. TRS and the Charter Schools should determine ways to deliver this data earlier.

    Status: Resolved. TRS believes the data now gets to the OA when needed. The OA agrees.

3. As TRS updates and improves active member data on its database, it does not flag data changes, which leads the OA to question the changes. TRS should provide data change indicators in the data they send to the OA, so that the OA will be able to reconcile more easily.

    Status: Resolved. TRS provides a separate file with exceptional data changes.

4. TRS provides a valuation data reconciliation to the OA, but reconciles from its own prior year data to the current year. Reconciling from the OA's version of the prior year's TRS data would be more helpful to the OA.

    Status: No longer applicable. TRS does not believe this is a problem for the OA. Since TRS does not have the final valuation data file (which is created by the OA) it would not be able to perform this reconciliation with any accuracy. The OA agrees.

5. TRS provided on-line benefit certification capability to the OA, but this is not utilized in all cases. TRS and the OA should work on extending this efficient procedure to all benefit certifications.

    Status: In process. TRS has automated most calculation types – only death benefits remain manual but will be automated shortly.

6. TRS transfers active member data to the OA on compact disc. This is both inefficient and a data security risk. A secure electronic link should be established between TRS and the OA for the purpose of transmitting member data.

    Status: No longer applicable. TRS and the OA are using FTP.

7. Data security can be improved. Consider implementing or developing data security measures such as recertifying access, not allowing network/data access through laptop computers, and training employees on data security procedures.

   Status: Completed. Since the last audit TRS has created and filled a new position -- security professional –and mandatory security training is in place. Performance evaluations of all employees include information security elements.

8. Some of TRS' technology may no longer be supported by vendors or may become obsolete. TRS should evaluate its technology and make updates if appropriate.

   Status: In progress. A five-year engagement related to modernization of systems kicked off in December 2013, starting with replacement of the UPS System.

9. There is no formal succession plan in place at TRS. TRS should identify which positions require a formal succession plan, establish a succession plan and then implement it.

   Status: In process. Human Resources is actively involved in creating a strategic plan since more than 50% of leadership key roles are staff members over the age of 50. The initiative on strategic planning has been kicked off and is in progress.

Status of Prior Recommendations – BERS

BERS staff indicated that they had not seen the prior recommendations until GRS emailed them a copy in preparation for our visit. Therefore, most of the issues are unresolved.

1. There is no specific documentation of BERS' process to provide active member data to the OA. BERS should document its active data process in writing.

   Status: In process. This is part of the development of CPMS.

2. BERS does not supply ITHP and required employee contribution data to the OA for the valuation. The OA and BERS should determine whether this data is reliable, and if so, the data should be provided to the OA. When BERS' computer system is upgraded, this data should be included in the database and provided to the OA.

   Status: In process. This is addressed in the development of CPMS.

3. BERS does not provide a year-over-year data reconciliation to the OA to help in the valuation data process. BERS should provide a data reconciliation to the OA.

   Status: No longer applicable. BERS does not receive the final valuation file from the OA and is therefore unable to provide a reconciliation from that point.

4. BERS does not supply full-time employees' service and part-time employees' hours to the OA for the valuation. The OA and BERS should work together to validate this data, and if valid, it should be provided to the OA.

    Status: In process with the development of the new system.

5. Sending paper files to the OA for benefit certification purposes is inefficient and poses a data security risk. These files should be sent to the OA electronically via a secure link.

    Status: Unresolved. GRS believes that electronic copies are ideal, but that paper copies are acceptable, so long as proper precautions are taken.

6. BERS' benefit calculation process is not fully documented. BERS should prepare and maintain a written manual that documents the process.

    Status: Resolved. During the meeting, staff indicated that this was unresolved. After the draft report was circulated, BERS indicated that this has, in fact, been resolved and a written manual does exist that documents the retirement benefit calculation.

7. The transfer of member account balances to TRS and other Systems is typically delayed because the process must be initiated by the member. This should be resolved legislatively.

    Status: Not applicable. BERS does not agree that this should be a recommendation for BERS, since it has no legislative authority.

8. BERS should place an indicator in PPMS if a member's benefit has not been finalized.

    Status: Resolved.

9. The active valuation data process depends too heavily on the involvement of Prudential. BERS should complete the effort to replace the Prudential data system. The OA should be consulted on the data elements to be included in the new system, and should be given access to the new system for benefit certification purposes. An outside vendor should be engaged to provide data back-ups and business continuity protection services.

    Status: In progress. This will be resolved with the implementation of the new system and/or as a result from the development of a new business continuity plan that is currently being developed.

10. BERS transfers active member data to the OA on compact disc. This is both inefficient and a data security risk. As mentioned above, a secure electronic link should be established between BERS and the OA for the purpose of transmitting member data.

    Status: Resolved.

11. Given the current data system arrangement, efficiency and data security can be improved.

    Status: In progress with the development of the new system.

Status of Prior Recommendations – POLICE

1. The active member valuation data provided to the OA is of high quality, but there is an ongoing accuracy issue with respect to the service reported for a small number of members. This accuracy issue should be resolved.

    Status: Resolved. As a result of a revised annual statement process that includes service data, the quality of service data has improved dramatically.

2. World Trade Center election data should reside in COPS and World Trade Center data should include an indication of whether, and when, members reclassify their status to World Trade Center accidental disability.

    Status: In process. This is in development, with user testing scheduled for late January 2014.

3. POLICE does not provide a year-over-year data reconciliation to the OA to help in the valuation data process. POLICE should provide a reconciliation report to the OA.

    Status: No longer applicable. OA has not requested this.

4. Sending paper files to the OA for benefit certification purposes is inefficient and poses a data security risk. These files should be sent to the OA electronically via a secure link.

    Status: Unresolved. Recommendation was rejected by POLICE. Paper transmission is still happening, as System was developed to generate paper, not electronic files. Setting up a secure link would be more work for POLICE. GRS believes that electronic copies are ideal but that paper copies are acceptable so long as proper precautions are taken.

5. It continues to take a relatively long time from member initiation of the retirement process to finalization of the benefit. The POLICE and the OA should explore ways to reduce the time it takes to finalize benefits, including determining whether the OA needs to require certification of all benefits.

    Status: GRS does not believe this is within the control of POLICE. Current backlog is due to the length of the collective bargaining process – at one point there was an 18 month backlog but COPS system increased bandwidth (to allow for a larger volume of cases to be processed), decreasing backlog to 3-4 months. Normal turnaround is 2-3 months.

6. A large period of time elapses between separation from service and electing a benefit option, which could allow for anti-selection against the System. POLICE should establish a procedure whereby a member elects an option earlier in the process.

    Status: No longer relevant. POLICE have rejected this recommendation.

7. POLICE experienced a data security breach during the course of the first engagement Administrative Review. POLICE should share the findings of its investigation of the incident with the other Systems to help prevent similar incidents at all the Systems.

    Status: Completed. All the systems are aware of the breach. The missing information is back on site, locked up physically.

8. POLICE should continue to look for ways to streamline report creation by COPS.

    Status: In process and ongoing. Process improvements continue to be made.

9. Data security can be improved.

    Status: Completed. POLICE have replaced passwords with fingerprint scanners.

10. Tier 3 member data should be integrated into COPS.

    Status: In process. Specifications have been developed and are in the review stage.

Status of Prior Recommendations – FIRE

1. There is no specific documentation of FIRE's process to provide active member data to the OA. FIRE should document its data process for active members in writing.

    Status: No longer relevant. OA's detailed data request provides sufficient documentation to FIRE. OA gives file layout to pension unit, BTDS (computer group of Fire Department), documentation is developed to be understood by any computer person.

2. World Trade Center election and buy-back service data reside in data files which are separate from FIRE's main database. These data items should reside in FIRE's main database. World Trade Center data should include an indication of whether, and when, members reclassify their status to World Trade Center accidental disability.

    Status: This is difficult to implement because the law is constantly changing/evolving. FIRE has a database with 12,000 members on it with much of the information. This file is provided to the OA.

3. FIRE does not provide a year-over-year data reconciliation to the OA to help in the valuation data process. FIRE should provide a reconciliation report to the OA.

    Status: No longer applicable. FIRE does not receive the final valuation file and is therefore not able to reconcile to it.   OA has not requested this from FIRE.

4. Sending paper files to the OA for benefit certification purposes is inefficient and poses a data security risk. These files should be sent to the OA electronically via a secure link.

    Status: Resolved. This was resolved by removing SSNs from the paper files sent.

5. Active member data is entered into FIRE's database manually, which increases the risk of errors. When FIRE implements a new data handling system, the system should ensure that data can be entered electronically.

    Status: Completed. New system has addressed this.

6. Data used for preparing non-finalized benefit calculations must be printed out and stored on paper because the current data system cannot retain historical data. FIRE's new data system should be able to store historical data.

    Status: Completed. New system has addressed this.

7. In the benefit calculation process, 3-year average salary is manually computed. We understand the new data system will contain salary history data and sufficient logic to do this computation for members appointed prior to July 1, 2000.

    Status: Completed. New system has addressed this.

8. Reserve transfer calculations are calculated manually. The new computer system should contain logic to automate these calculations.

    Status: No progress. This issue is not within FIRE's control. FIRE is open to pursuing this if OA provides the logic. However, these cases are very rare. GRS recommends this item be removed from the list.

9. The OA should be given access to actual member data for benefit certification purposes.

    Status: No progress.

10. A large period of time elapses between separation from service and electing a benefit option, which could allow for anti-selection against the System. FIRE should establish a procedure where a member elects an option earlier in the process.

    Status: Not applicable. This issue is largely outside of FIRE's control. The issue is largely driven by the fact that contracts are still open.

11. With regard to disaster recovery of data, FIRE has not tested the retrieval and restoration of its data backups. This should be tested periodically.

    Status: Completed. Tests are performed to make sure restoration happens.

12.   Data backups are only sent offsite weekly. This should be done daily.

Status: Completed. Changes are backed up daily.

13.   Data security can be improved.

Status: In process. FIRE does not allow network or data access through laptop computers. More could be done with corpus funding.

14.   Corpus Funding.

Status: Corpus funding has been approved for all Systems except FIRE.

Comment: Corpus funding for the other Systems has allowed investments in technology and staffing. FIRE thinks corpus funding is unlikely due to autonomy of the Fire Department.

APPENDIX 1

FINDINGS BY ENTITY (OA AND EACH SYSTEM)

MEETING WITH THE OA

The Administrative Review consists of a review of the procedures, database and communications between the Office of the Actuary (OA) and each of the five major Retirement Systems (Systems) of New York City with regard to the valuation data and benefit certification. GRS met with the OA to begin the review. During that meeting the OA described the lines of communication between the OA and each of the Systems. During the second engagement, GRS will perform a walk through the OA offices, similar to the walk through GRS had with the Systems. The processes currently used have some built in redundancies which provide useful crosschecks.

The OA triggers the data process with a request around May or June to each of the Systems detailing precisely each data item required by the OA. Then, in June or July, the OA follows up with each System to discuss the data request and iron out any related problems.

Data is currently transmitted through FTP for FIRE, POLICE, TRS, BERS, a number of NYCERS providers and Buck.

In addition, the OA tracks Union employment contracts and may adjust salaries in the database when conditions warrant. In addition to member data, the OA receives the contracts from the Office of Labor Relations (after sending a data request) and the assets from the System and the auditors.

The OA has not developed explicit service purchase assumptions or promotion assumptions but does account for them indirectly within the salary scale increase assumption when able (applies to all Systems).

During the meeting with GRS, the OA described the process for FIRE first, and then described the differences for the other groups. The results of the GRS administrative review with the OA are presented in a similar manner. First we present the review of FIRE and then we present the additional information related to the other Systems.

FIRE Administrative Review with OA

FIRE Valuation Data Flowchart

```
                                           ┌──────────┐
                                           │   PMS    │
┌──────────┐        ┌──────────┐           └──────────┘
│          │        │          │  ↙
│   FIRE   │ ──→    │    OA    │ ↖
│          │        │          │           ┌──────────┐
└──────────┘        └──────────┘           │   PPMS   │
                         │                 └──────────┘
                         ↓
                    ┌──────────┐
                    │ Data File│
                    └──────────┘
                         │
                         ↓
                    ┌──────────┐
                    │Buck/ProVal│
                    └──────────┘
```
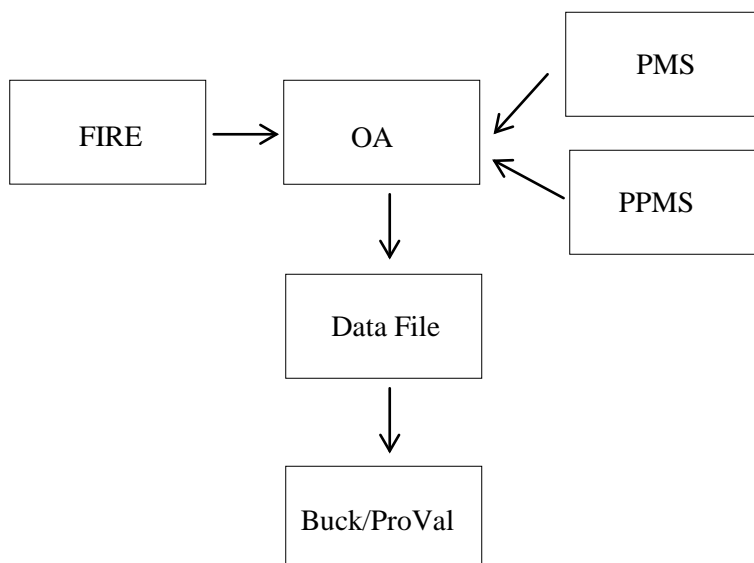
The OA documents all steps in a binder and then uses that binder as a guide for the next year. All business rules are documented in the binder. The OA indicates that it attempts to review all data within 5 business days of receipt for consistency and reasonableness. A more detailed data review is then subsequently performed. The data file processing is described as follows:

Step 1: Break data down into metrics, check for blank fields, duplicate records and reasonable ranges;
Step 2: Reconcile data with prior year;
Step 3: Send System a memo identifying any discrepancies;
Step 4: Fix reconciliation with additional information from System;
Step 5: Transmit data to Buck explaining reconciliation and detailing the process and any remaining discrepancies. All edits that the OA makes are communicated back to the System (and any other relevant party).

After Buck receives the member data, they perform additional checks. Any edits they make are communicated back to the OA.

In all, there are five parties involved in the process: OA, PMS, PPMS, FIRE, and OLR.

The typical time frame from data request to valuation ready data is three months. The OA prefers to have all Buck's results by November 30, with a valuation completion target date of mid-December.

Valuation results for all five Systems are published by the OA at the same time.

MEETING WITH THE OA

POLICE Administrative Review with OA

POLICE Valuation Data Flowchart

```
                                        ┌──────────┐
                                        │   PMS    │
                                        └──────────┘
┌──────────┐      ┌──────────┐               ↙
│  POLICE  │ ───→ │    OA    │ ←──
│  /COPS   │      │          │ ←──      ┌──────────┐
└──────────┘      └──────────┘          │   PPMS   │
                        │               └──────────┘
                        ↓
                  ┌──────────┐
                  │ Data File │
                  └──────────┘
                        │
                        ↓
                  ┌──────────┐
                  │Buck/ProVal│
                  └──────────┘
```
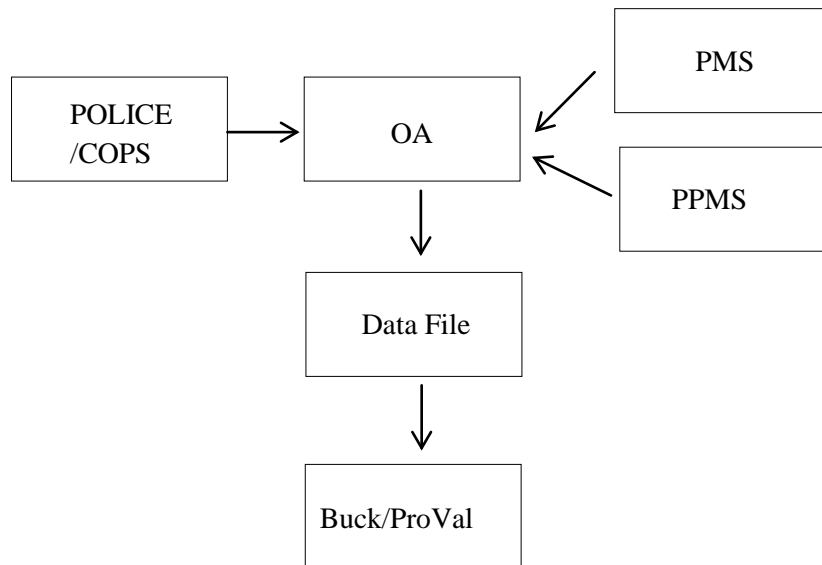
The OA indicated that the process for POLICE is largely the same as for FIRE and includes the same number of data requests and the same number of entities involved in the data handling. Some special issues related to POLICE are as follows:

- COPS (the POLICE active database administration system) has some issues with the service field that POLICE are working on correcting;
- Different methods are used for handling loans across the Systems;
- For POLICE, there was a liability load due to concerns with data related to loan information (this only relates to the 6/30/2010 valuation); and
- POLICE flags service purchases and service buybacks in the data provided to the OA.
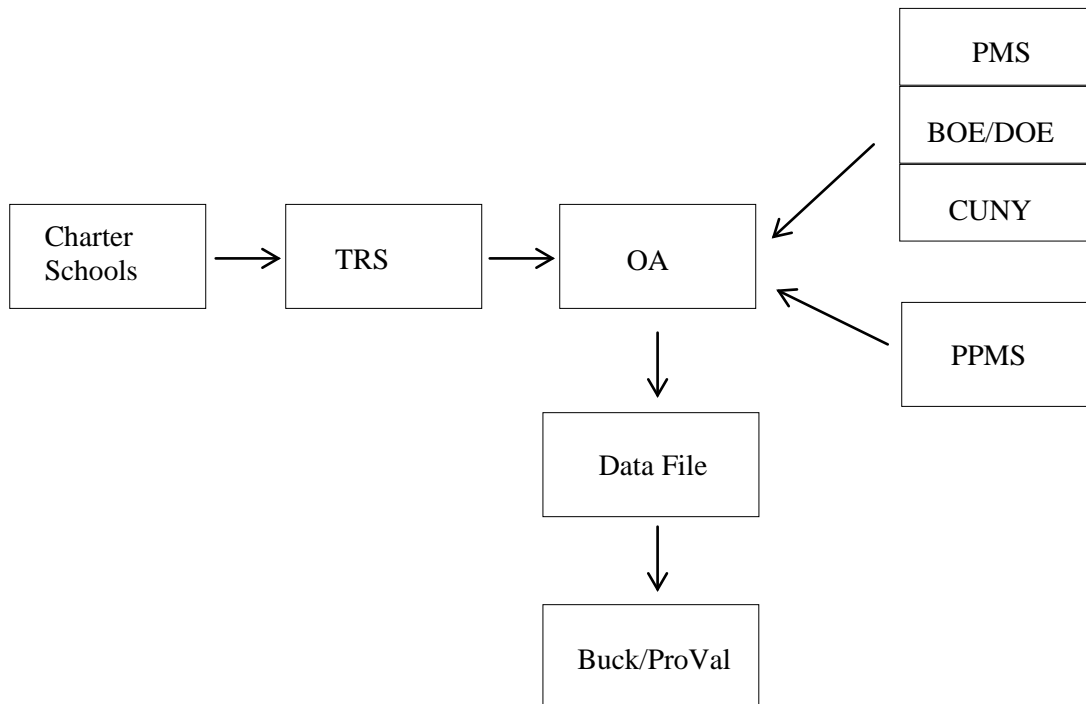
MEETING WITH THE OA

TRS Administrative Review with OA

TRS Valuation Data Flowchart

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                                                    ┌─────────────┐
                                                    │     PMS     │
                                                    ├─────────────┤
                                                    │   BOE/DOE   │
                                                    ├─────────────┤
                                                    │    CUNY     │
                                                    └─────────────┘
  ┌──────────┐      ┌──────┐      ┌──────┐
  │ Charter  │ ───► │ TRS  │ ───► │  OA  │ ◄────
  │ Schools  │      │      │      │      │
  └──────────┘      └──────┘      └──────┘ ◄────  ┌─────────────┐
                                      │           │    PPMS     │
                                      ▼           └─────────────┘
                                 ┌───────────┐
                                 │ Data File │
                                 └───────────┘
                                      │
                                      ▼
                                 ┌───────────┐
                                 │ Buck/ProVal│
                                 └───────────┘
```

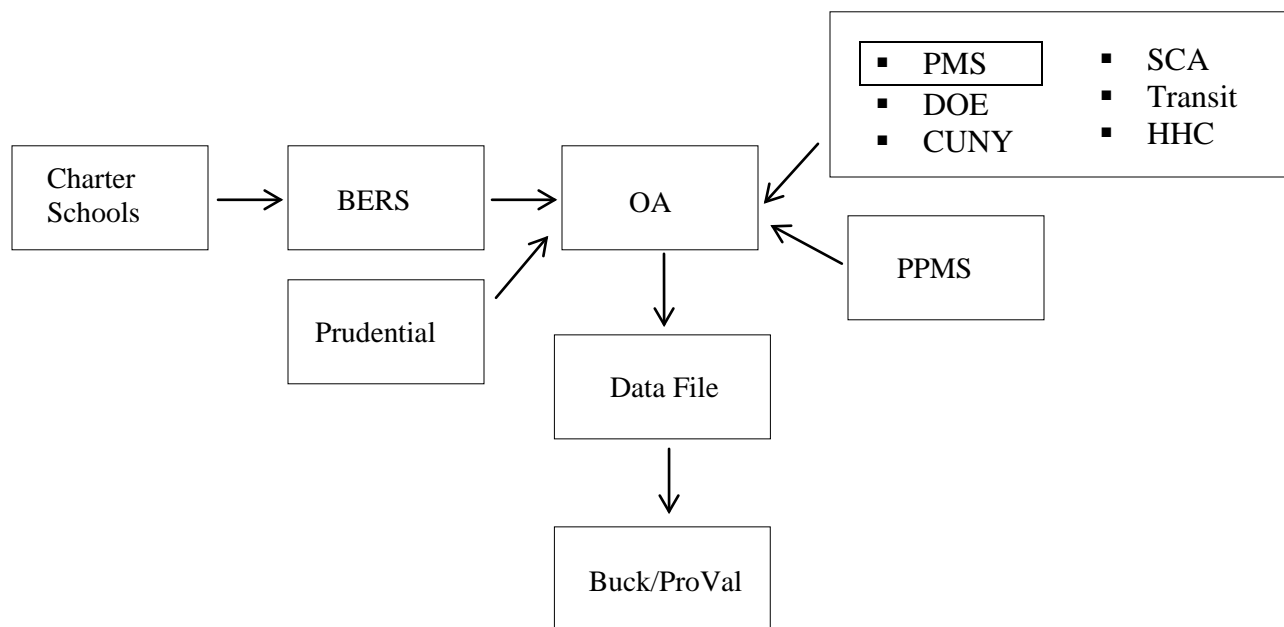Some special issues related to TRS include:

- Retiree payment data comes from PPMS (for all Systems). New retiree data is also provided by TRS. The TRS information contains non-changing data elements that are not in PPMS. The OA maintains a database going forward that is developed from the matured information provided by TRS and PPMS;
- The Charter Schools provide the data to TRS and TRS provides to OA;
- Many of the new retirees show up as active/inactive due to timing and the end of the school year;
- Pensionable earnings are more complicated:
  - Base Pay
  - Summer Pay (Chapter 683)
  - Per Session (e.g., coaches stipend)
  - Coverages (covering for another teacher that is absent)
  - 6^{th} Period Pay
  - Bonus (based on student performance)
- There is more reliance on accountants for asset infromation due to the TDA, variable and fixed funds (TRS has five variable funds).

MEETING WITH THE OA

BERS Administrative Review with OA

BERS Valuation Flowchart

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                                              ┌──────────────────────────────┐
                                              │  ▪ PMS        ▪ SCA          │
                                              │  ▪ DOE        ▪ Transit      │
                                              │  ▪ CUNY       ▪ HHC          │
                                              └──────────────────────────────┘

┌──────────┐      ┌──────────┐      ┌──────────┐
│ Charter  │─────▶│  BERS    │─────▶│   OA     │◀────
│ Schools  │      │          │      │          │
└──────────┘      └──────────┘      └──────────┘◀────  ┌──────────┐
                  ┌──────────┐          ▲              │  PPMS    │
                  │Prudential│──────────┘              └──────────┘
                  └──────────┘          │
                                        ▼
                                  ┌──────────┐
                                  │Data File │
                                  └──────────┘
                                        │
                                        ▼
                                  ┌──────────┐
                                  │Buck/ProVal│
                                  └──────────┘
```

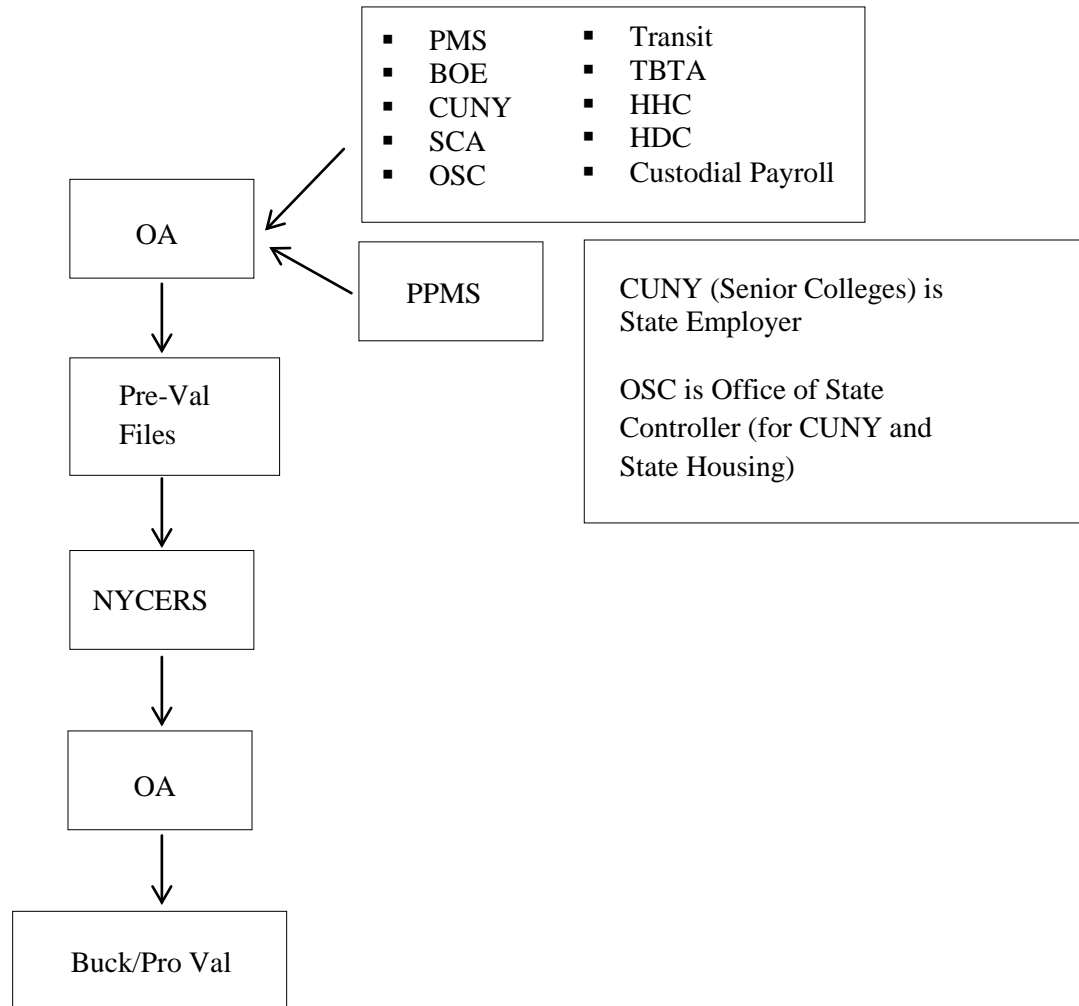Some special issues related to BERS include:

- Complete infomation on part-time employees is requested by the OA, but has not been historically provided to the OA;
  - Up to $2/3^{rd}$ of members are part-time
  - Complete data for part-time employees is not provided, such as hours worked in previous year, hours expected to work in upcoming year, hours constituting full time, etc.
  - OA develops service for valuation based on date of hire
  - Department of Education considers some positions full-time even though job requires less hours than other full-time positions
- All retiree information comes from PPMS;
- For new retirees, valuation data is verified against data submitted for benefit certifications; and
- BERS only has 1 variable fund, versus 5 for TRS.

MEETING WITH THE OA

NYCERS Administrative Review with OA

NYCERS Valuation Flowchart

▪ PMS	▪ Transit
▪ BOE	▪ TBTA
▪ CUNY	▪ HHC
▪ SCA	▪ HDC
▪ OSC	▪ Custodial Payroll

```
            OA
             |
             v
         Pre-Val
          Files
             |
             v
          NYCERS
             |
             v
            OA
             |
             v
       Buck/Pro Val
```

PPMS

CUNY (Senior Colleges) is State Employer

OSC is Office of State Controller (for CUNY and State Housing)

Some of the special issues related to NYCERS are:

- The data collection process differs substantially from the other Systems (as illustrated above);
    - o OA collects data from several sources and prepares preliminary valuation files to give to NYCERS
    - o NYCERS receives OA preliminary files and processes the data in its database
    - o NYCERS sends valuation data back to OA after processing preliminary valuation files
- The bankruptcy of the Off Track Betting Corp. and its on-going accrued (and on-going) contributions; and
- Possible upgrade of the NYCERS System.

MEETING WITH THE OA

Benefit Calculations

During the administrative review for the OA, we also met with representatives of the Benefit Certification Services Division (CSD). The discussion for part of the review started with NYCERS. For the other plans, the differences were highlighted.

General issues/processes that apply to all Systems include:

- OA CSD has a specialist for each System;
- Each specialist is versed in at least 3 Systems to provide back up;
- There are a list of certain types of cases that are reviewed by the manager;
- NYCERS, TRS and BERS wrote their own computation programs;
- POLICE and FIRE and BERS computation programs were written by the OA;
- OA handles all cases; the Actuary certifies all cases; and
- For big picture issues, the OA may consult with Buck for advice.

For NYCERS, the process of benefit certification was described as follows:

- NYCERS emails the OA a list of cases;
- OA logs into NYCERS system (web based) and reviews/certifies calculations;
- 415 limits are checked for all cases;
- Two 415 reports are generated (1 for base benefits; 1 for excess plan);
- FAS calculations are checked;
- Some cases are compared to data submitted for valuations;
- Cases marked computerized are done by NYCERS and reviewed by OA;
- Cases marked manual are completely done by OA;
- The OA has a doer, checker, reviewer process;
- Every 10th case is pulled and reviewed in greater detail;
- The OA estimates that the error rate for NYCERS cases is 4-5%; and
- Recalculations and re-certifications are performed if contracts are settled late.
-

Issues/processes that differ for POLICE and FIRE include:

- Calculations are delivered to the OA manually by messenger;
- Calculations are checked for reasonability;
- POLICE and FIRE wait until contracts are settled (this allows the death gamble benefit to be operable for a longer time than would be the case if contracts were settled sooner) to finalize a case;
- OA computes the options for POLICE and certifies the computation after the option is elected by member; and
- FIRE uses a program developed by OA to generate the option letter; OA certifies the calculation after an option is elected.

MEETING WITH THE OA

Issues/processes that differ for TRS include:

- Most computerized process;
- OA can VPN directly into the TRS system (UPS – Unified Pension System);
- Certification is done electronically;
- Manual cases (about 5%) are delivered via messenger or FAX, if rush; and
- Error rate is approximately 2% for TRS (OA corrects/identifies errors for TRS).

Issues/processes that differ for BERS include:

- Certification requests are sent to the OA manually through messenger;
- BERS sends email alerts so OA knows how many cases to expect;
- BERS/OA is trying to create an electronic approach;
- BERS uses a program generated by the OA to perform the calculations;
- OA reviews the calculations; and
- BERS messenger picks up the certifications when OA completes them.

Security

The OA is in the process of updating its computer systems. One of the recent improvements was the implementation of the secure FTP (file transfer protocol) site. This site is available for transferring electronic data between the OA and each of the Systems as well as the OA and any other vendors (such as Buck consultants and GRS). As users of this system, we have seen first-hand how data is transmitted. All data that has any identifiable member information (social security numbers, pension numbers dates of birth, etc.) are double encrypted and uploaded to the secure FTP site. Files that are uploaded must be transferred (downloaded) the same day. Data may not reside on the FTP site overnight. Files are only allowed to stay on the FTP site for 1 day. GRS had to acquire special software to handle the un-encryption process.

Only a limited number of OA senior staff have remote access to the OA network from outside the office.

The OA office is kept locked and access is granted from within. The building has security which screens people before allowing access to the elevators.

MEETINGS WITH EACH SYSTEM

Findings Related to all Systems

Discussions with all of the Systems confirmed the following:

- The OA has an excellent working relationship with all of the Systems;
- The Systems and the OA have taken huge strides forward in the ability to transmit data securely with almost all transmissions occurring though secure FTP;
- The OA's annual kick-off meeting and data requests provide the necessary communications and explanations that the Systems need to fulfill the OA's data needs;
- The Administrative Review is one of several audits the Systems go through regularly which places a burden on System Staff. The Systems' staffs do not view the annual valuation process as service/value provided to the Systems by the OA. Rather, they view this as a service/value provided to the City/Comptroller by the OA that requires their participation. The Systems should be the single source of data for the OA and should maintain a historical file of information sent to the OA; and
- The Systems should develop a regular mechanism to allow for sharing of ideas on operations (such as new technologies, security procedures, business continuation plans, etc).

Other recommendations:

- Currently the OA produces formal valuation reports for POLICE and FIRE. The OA should produce a formal valuation report for each of the other Systems; and
- Until such time as the OA is able to produce full valuation reports, the OA should include the summary of benefits in the Appropriations Letters (instead of referencing the benefit descriptions in the CAFRs).

MEETING WITH THE
NEW YORK CITY EMPLOYEES' RETIREMENT SYSTEM (NYCERS)

Data Processing for Valuation Files

The OA drives the valuation process, holding an annual kick-off meeting at NYCERS and ultimately creating databases in which NYCERS fills in the pieces. NYCERS has a good relationship with the OA, noting that they work well together. However, as can be seen in the flow of data chart under the OA's section above, the OA gathers data from a multitude of sources and creates an initial valuation file that NYCERS then reviews and supplements. While the OA has indicated that this process is working well, we agree with the prior actuarial auditor that ideally, NYCERS should be the single source of data for the valuation files. However, the OA may wish to continue to receive files from other sources for cross-check/data verification purposes.

Currently the OA gathers information from PPMS (the Pension Payroll Management System), PMS (the city active Payroll Management System) and other employers payroll information. However, NYCERS is the source for data entered into PPMS and they collect pension related information from all the employers for active members on a monthly basis, so they should have all the data the OA needs within its database.

The PPMS file is produced electronically and month-by-month changes are tracked in retiree data. NYCERS screens the active and pensioner valuation files with its own edit checks – reviewing for anomalies which are sent to the Employer who then updates and downloads the information.

NYCERS does not provide data on actual ITHP balances, minimum employee contribution balances and minimum ITHP balances -- the OA estimates these amounts and adds the fields to the active valuation file.

The NYCERS pension system is called PROD. The OA was not involved in the development of PROD. NYCERS is researching the replacement for PROD. We recommend that the OA be involved so that the new system can easily generate the data needed for the valuations.

One data element that was discussed with NYCERS but was not discussed with the OA or any of the other systems was what NYCERS referred to as the non-member file. NYCERS downloads and maintains a file of City employees that are not members of NYCERS. This would include employees who are members of the other Systems or employees who are not members of any of the Systems. They maintain this file historically in order to expedite service purchases or service reinstatements in the event that someone on this file becomes a member of NYCERS in the future. We recommend that the OA discuss this file with NYCERS to determine if the OA can use the data for developing service purchase assumptions.

MEETING WITH THE
NEW YORK CITY EMPLOYEES' RETIREMENT SYSTEM (NYCERS)

Data Processing for Benefit Calculations

NYCERS has a self-serve website ("My NYCERS") where members can (or will soon be able to):

- Review member profile information;
- Complete loan applications (if eligible), including credit card payment capability;
- Use estimators for loans, retirement benefits and buy-backs; and
- Download Annual Disclosure Statements including Form 1099 and Pensioner award letters.

In addition to My NYCERS, an Annual Disclosure Statement (ADS) is produced by the Communications Division and sent to members (annually) as well as being posted on-line. Each July and December, estimated benefit letters are sent to those who are retirement eligible. COLA letters are sent every September to the entire pensioner population (including those not receiving a COLA). Lastly, NYCERS also offers other support including a call-in center, and monthly in-house seminars.

When members are ready to start the retirement calculation process, they can file applications on-line, in person at a walk-in center, or by mail. Most NYCERS' calculations of pension benefits are automated. Complicated cases require manual calculation. The OA certifies all benefit calculations. All 415 calculations go to the OA one year post retirement at which time the necessary accounting adjustments are made since the member's benefits are not affected. NYCERS would like the OA to sign off on an automated program for benefit calculations so that individual calculations no longer require paper transmission of certification. We recommend that the OA consider such an arrangement which would ultimately free up OA resources for other uses.

The benefit computation process follows this general outline:

- Member files a retirement application in person by visiting the Client Services Center or by mail;
- Counseling is available upon request;
- Once retirement date arrives, the case is processed;
  - Service and member contributions are verified
  - Option letter is sent to member
- Member has 60 days to elect an option shown in the retirement application (otherwise the maximum benefit is paid);
- A PCEF file is transmitted to FISA monthly;
- Benefit is paid at 70% to 80% until finalization;
- Benefit Finalization typically occurs 2-3 months after retirement;
- Twelve months after retirement, case is reviewed;
- OA is sent case (electronically) to certify benefits; and
- OA prints out details, signs and messengers certified document back to NYCERS.

MEETING WITH THE
NEW YORK CITY EMPLOYEES' RETIREMENT SYSTEM (NYCERS)

Security and Business Continuation

NYCERS has a comprehensive disaster recovery plan that is practiced twice a year. Testing performed in April 2013 showed ability to get everything back up within 4 hours (reduced from 72 hours in previous testing), in part due to the Storage Area Network. The Mainframe powers up in an hour. An alternate location exists in Long Island City (with capacity for 150 employees) for running the operations in case of an emergency. In addition, vulnerability/penetration testing is performed on an annual basis. Data is kept secure by storing in a secure folder, with hardware encryption (VTL). All data transmissions use secure FTP. NYCERS employees cannot connect to servers through the Internet, and cell phone use is banned on premises. NYCERS addressed document imaging and scanning in June 2013. The document destruction/scanning policy incorporates a 9-month retention period and Bergen Street has a physical paper warehouse.

There are approximately 13 agencies/vendors involved with data for NYCERS. For each vendor or agency that NYCERS supplies data to, they enter into a contract where that agency/vendor assumes responsibility for data security once it is in their possession. NYCERS views the valuation data as owned by the OA.

Summary Evaluation: The recordkeeping and data collection procedures used by NYCERS are generally sound and result in integrity of stored data that is generally good. Modernization of the data system is scheduled for FY2017. We recommend that NYCERS involve the OA in this process to ensure that all of the OA's data needs (and/or its wish list) are considered in the development of the new system. NYCERS is also currently exploring converting to virtual servers. We recommend that they consult with POLICE who are in the process of implementing virtual servers. We also recommend that NYCERS consult with TRS on its security educational program for employees of the retirement system (during our tour, we did see one or two employees who had their cell phones out on their desks).

MEETING WITH THE TEACHERS' RETIREMENT SYSTEM (TRS)

Data Processing for Valuation Files

TRS has a data quality management group which recently updated practices for data completeness and accuracy. New TRS employees can easily pick up the data process due to file structure documentation and a processing sheet that lays out the sequence of data steps, user verification, etc. The whole function checks quality, using generic business rules and ranges. Data issues are resolved by going back to the source of the information, and checking the end results. Last year the system implemented secure file transfer (SFTP) through DoITT. TRS obtains human resource and salary data as of June 30 from the various employers covering TRS members, and receives a payroll file from FISA entered into the TRS database each payroll period. TRS uses the salary data and other available data on new members, withdrawals, member contributions and ITHP balances to create an active valuation file. The OA independently obtains salary data as of June 30 for TRS members from the Office of Personnel Administration (OPA), FISA, and miscellaneous employers covering TRS members. The OA uses this salary data to fill in any missing salary information in the data provided by TRS. The only group that does not send information to the OA is Charter Schools. TRS captures wage and salary data through an Interface System for those TRS members employed at Charter Schools. There is also a manual process to capture missing salary information and/or to reconcile data. This occurs because reported wages are not contractual salary. A project to further automate this process is underway.

TRS receives Charter School data in August and provides it to the OA in September. TRS is responsible for populating the data elements in PPMS and is the primary source of the data related to TRS members. It maintains data on terminations, deaths and new pensioners on its own system and sends that to the OA. The OA uses the information from TRS, PMS (and the other employers' data), and PPMS to develop the valuation files. The OA subjects the active and pensioner valuation files to thorough edit checks. The number of questions from the OA has decreased in recent years as the data process has improved. TRS finds value in the annual kick-off meeting with the OA, views the OA as colleagues, and works well with them via designated TRS and OA point persons. One example of the collaboration: after Hurricane Sandy, TRS employees used part of the OA's offices and facilities to provide member service (including processing retirements) due to the damage at 55 Water Street.

Data is sent by TRS to DOE and FISA electronically, and a retiree feed is prepared on a monthly basis. TRS supplied a list of vendors and has established secure methods of transmitting data to each vendor. Vendor security depends on the level of information transmitted, and a long and very detailed security clause ("Appendix A" of that document) is included in contracts. Once a month a death match is run on the active population, and deaths are double checked against City records. The retiree death match uses CHARMS.

MEETING WITH THE TEACHERS' RETIREMENT SYSTEM (TRS)

Data Processing for Benefit Calculations

The same database that is used to generate data for the OA is also used to develop Annual Benefit Statements (ABS), which serve as pension estimates for members. TRS notes that these are often compared to benefit estimates provided to members by the United Federation of Teachers. Quarterly account statements are sent to all members. These include actual contributions, ITHP amounts, loan and variable account information. Account balances are available on-line for all members. On-line features are being enhanced to include TDA enrollment and other information, investment elections, changes in beneficiary designations and other information, changes of address, a loan calculator, loan applications and a benefit estimator.

The TRS website contains all data for pension calculations, along with many self-service features. A walk-in center is also highly utilized. Nearly all calculations of TRS' pension benefits are automated. Complicated cases require manual calculations. Eight TRS staff members perform and check calculations, and the OA separately verifies and certifies each benefit calculation. TRS sends the OA an electronic work list with a calculation sheet as an attachment to compare against OA calculations. The OA has on-line access to the TRS system for inquiry/approval for pension certifications as well as imaged records. Lastly, TRS notarizes and scans retirement application documents into the system. The usual timing is 3-4 months from member initiation of the retirement process to benefit finalization. The benefit computation process follows this general outline:

- Members walk in on 2nd floor to file application;
- Counselors review application with member and collect any additional information (such as age verification documentation);
- All documents get scanned and a workflow project is started;
- Once retirement date has passed, benefit calculations are preformed;
- TRS gives an initial advance payment of approximately 85% of calculated benefit;
- Benefit calculation is finalized within 3 to 4 months after effective date of retirement;
- A lump sum payment is made the month the benefit is finalized for the difference between what was paid and the actual benefit (interest may be paid at 5%, depending on the cause of the delay);
- Members must elect payment option on the application and can change the payment option up to 30 days from the effective date of retirement. TRS provides the retirement payment options and all other informative information on the Annual Benefits Statement;
- OA logs into TRS system to see case file and perform benefit certifications.

Security and Business Continuation

Hurricane Sandy presented a 3-month test of the comprehensive disaster recovery and business continuation plans. TRS currently has a trailer solution for business continuation. Sandy exposed some weaknesses (and strengths) of the plan and TRS is developing revisions based on this experience.

MEETING WITH THE TEACHERS' RETIREMENT SYSTEM (TRS)

A new position was created and filled – Information Security Officer – which has led to continuing focus on data security and recovery. The main data center is located in New Jersey. Data is backed up regularly. While 99% of the data that is electronically transmitted is encrypted, TRS uses Brooklyn City Storage for historical paper member case files (all incoming correspondence has been scanned since the 1990's). A retention policy is in place which details which records can be kept for how long.

TRS has recently made employee security education the focus of security enhancements. They have a well-developed program that educates TRS employees that security begins with them. This program includes a policy that prohibits charging of cell phones from employees' computers and a clear desk policy that requires sensitive information to be replaced in secure storage after usage. TRS is moving to a no paper policy but is not there yet. Although we applaud these policies, during our TRS Premises walk around we did see one desk with a cell phone violating the policy and we saw one area where boxes were stacked on the floor with member information waiting to be taken to offsite storage. We understand that these boxes could accumulate and sit on the floor anywhere from two to eight weeks before being taken offsite. Although we were told the floor was secure and the doors were locked with cameras at every door, there did not appear to be a substantial difference in the security of this portion of the office compared with the other portions of the office. We believe that having a clean desk policy while allowing boxes of sensitive material to accumulate on the floor seemed to be counter-productive. We recommend that the procedure of accumulating material for offsite storage be reviewed for consistency with the general security policies.

Summary Evaluation: TRS continues to use technology and experienced staff to provide complete valuation data to the OA. The data process works well, with the number of questions from the OA decreasing – perhaps due in part to the ABS, which provides a participant level check of the data. Providing on-line access to benefit calculation detail enhances communication. There is a comprehensive disaster recovery plan. Security, backup and disaster recovery procedures are sound. We discussed the following recommendations:

- Continuing to share TRS security and business continuity approaches with the other City Retirement Systems;
- Giving future actuarial auditors "modified" data that does not contain certain member-specific items (SSNs, dates of birth, etc.); and
- Translating laws relating to Tier VI into business rules.

We recommend that the Comptroller review the data security transfer language in the TRS vendor contracts (Appendix A) to determine if this language should be replicated for other contracts that involve transfers of member data (such as the Actuarial Auditor, and contracts through other agencies like Buck Consultants' contract through the OA).

We were impressed with the Security education of TRS employees and recommend that information regarding this program be shared with the other Systems.

MEETING WITH THE BOARD OF EDUCATION RETIREMENT SYSTEM (BERS)

Data Processing for Valuation Files

Prudential Financial, Inc. (Prudential) provides administrative recordkeeping services for BERS and plays a major role in providing valuation data to the OA. BERS sends active new member and withdrawal information to Prudential. Prudential collects information from PMS and enters data into the system for BERS staff to review. Once BERS completes the review, Prudential sends the information to the OA.

Currently, once BERS and Prudential complete the review, Prudential sends the active valuation data to the OA for use in the valuation. The OA does not make many corrections, or do they request a reconciliation (the OA indicates that they do request a reconciliation). The active valuation file supplied by Prudential includes actual employee contribution and actual ITHP balances for Tiers 1 and 2 but does not contain data on minimum employee contributions and minimum ITHP balances. The OA estimates these fields for valuation purposes. The OA gets the retiree data from PPMS.

BERS has hired Vitech to develop a replacement system that will be run in-house -- the Comprehensive Pension Management System (CPMS). The new system will be more flexible than the current system. It will also give staff greater control and eliminate reliance on Prudential.

BERS does not employ a formal set of business rules to verify data. They do verify data against the members' case files. In addition, they have monthly reconciliation procedures performed by its Fiscal Operation Department to ensure that BERS agrees with the Comptroller's Office for fiscal integrity. In addition, BERS has a Quality Assurance unit that ensures proper posting of members' accounts for payroll and lump sum contributions. There are a lot of part-time members. These members present a challenge because the definition of part-time status varies based on employment category. Service data comes from the DOE. For some members, BERS is able to compare service against digital records but for others it has to compare it against paper records. As a result, providing reliable service information for part-time members in the timeframe for the valuation has been difficult. Therefore, the OA uses actual pay and annualized service even though the benefit is based on annualized pay and actual service. BERS has performed an extensive study on the Department of Education's part–time workers and has created a solution within CPMS that will assist in providing more reliable service information to the OA.

Not all new DOE employees are automatically added to membership. Some employees are mandated members of BERS. These members are added to BERS membership either when they sign up or when they appear on payroll. They are added retro-actively to their date of hire. Membership for other employees is optional. These employees do not become BERS members until they apply to join. These members can buy back service to their date of hire (any time after becoming a member of BERS).

MEETING WITH THE BOARD OF EDUCATION RETIREMENT SYSTEM (BERS)

Communication between the OA and BERS is open and on very good terms. The data request provided by the OA is clear and sufficient for staff. The data request together with the annual kick-off meetings provides BERS with all the information they need to respond to the data request.

GRS recommends that BERS and OA meet as soon as possible to ensure that the new Vitech system provides all the data requirements of the OA.

Data Processing for Benefit Calculations

Pension calculations are done in-house using BERS benefit calculation software and sent to the OA for certification in the form of a hard copy. BERS identifies cases that are over IRC 401(a)(17) and 415 limits for the OA. The OA computes TDA annuitizations, if that option is elected. BERS would like to streamline certification process. They have reached out to the OA to see if there are options available other than having OA certify every calculation, such as certifying samples or certifying a program. There is a 4-5 week turnaround for certifications.

Security and Business Continuation

BERS follows the Department of Information Technology and Telecommunications (DoITT) security processes. BERS, however, vaults data which is available for 1 year. Backups are performed daily, monthly and annually. Iron Mountain is used for offsite storage and back-up. There is no formal physical relocation plan (part of a business continuity plan). However, BERS hosted some TRS staff after Hurricane Sandy. BERS is currently working with DoITT on tying BERS' backup disaster recover connectivity to DoITT's backup data center location.

BERS only has 2 vendors/agencies in which they share member data with: the OA and Prudential (which will be replaced once the new Vitech system becomes operational).

Summary Evaluation: The recordkeeping and data collection procedures used by BERS are generally sound and result in integrity of data reported to the OA that is good with the exception of part-time service. We recommend that this data be reviewed for the new system (CPMS) with the goal of being able to provide part-time service to the OA for the annual valuations. BERS security, business continuation and disaster recovery plans lag behind NYCERS, TRS and POLICE. We recommend BERS review and update these areas and reach out to the other Systems for information on what has worked and not worked (for each System) during Hurricane Sandy. BERS has indicated that security planning, beginning with an independent security assessment, has been recommended for inclusion in the budget. Business continuation and disaster recovery planning are being developed and incorporated into CPMS.

MEETING WITH POLICE PENSION FUND (POLICE)

Data Processing for Valuation Files

Initiated in 2005, the Comprehensive Officer Pension System ("COPS") contains records of all POLICE active members, with the exception of a very small subset (five Tier I members). COPS receives automated feeds from payroll/Police Department (PD) as well as from the Business Units. POLICE performs initial checks on the information entered by the various PDs, and communicates its findings back to the PD. Each COPS module was designed with built-in business rules to validate entries. Retirement information is entered into PPMS by POLICE.

A set of batch programs produce the data requested by the OA. Data processing for the OA is completed during August or September. The OA provides support to POLICE through effective open communication, which consists of monthly meetings with the OA and legal counsel. One item on the POLICE wish list is to set up FTP for sending files to OA (staff was uncertain if this had already been utilized for the 2013 valuation).

Data Processing for Benefit Calculations

With respect to the benefit calculation process – all members other than Tier III members have a 30-day Notice requirement, and interested members call for a one hour appointment with one of eight available counselors. Packets are sent to potential retirees in advance of the meeting and contain double-checked information. Potential retirees leave the meeting knowing what their initial pension check amount (90% of their estimated final benefit) will be. Paper Annual Benefit Statements (ABS) are sent to all active members which help with general education as well as making members very aware of their benefit amounts. The statements were revised to include service data, which led to this quote from the meeting, "[this is the] best auditing tool we have." As a result of member feedback on erroneous service data in the ABS, service data has improved dramatically. The biggest transaction relates to beneficiary updates after the ABS. However, pre-COPS deferred vested members do not receive an ABS, and there is no way to verify this information. A particular POLICE staff member finalizes all calculations and forwards to the OA via courier for verification. Less than 8% of members elect a beneficiary option in part due to early ages at retirement but also because there is a perception that the System overcharges for options. From member initiation of retirement process to benefit finalization is normally a 2-3 month process. A training manual with business processes is available.

In order to avoid recalculation of the pension benefit, POLICE waits until contract settlement to perform the final pension calculation. The backlog currently stands at 4,500 pension calculations. The COPS system has increased available bandwidth (the amount of data that can be processed at one time) to address backlogs once contracts are ratified. Also, the delay in benefit-finalization due to expired contracts result in the "death gamble" benefit being operational for a much longer time than would be the case if contracts were settled sooner.

MEETING WITH THE POLICE PENSION FUND (POLICE)

The benefit computation follows this general outline:

- Members give 30-day notice of retirement;
- Member makes an appointment with a retirement counselor (walk-ins are available also);
- A retirement package is sent prior to the counseling session (or are provided at session if walking in);
- Counseling takes one to two and a half hours – member services reviews case folder for accuracy and documentation. Member leaves with an estimate of their initial pension check amount, usually 90% of the estimated final benefit; and
- POLICE computes estimate with estimated options and final without options. OA calculates all final options and IRC 415 limits (only 7% to 8% of members elect options).

Security and Business Continuation

POLICE feel they are on the leading edge of security. All paper documents are imaged, legal documents are put on CD-ROM and are available on-line, and microfilm is converted to pdf. There are daily backup procedures and backup tapes are sent on a weekly basis for storage at an offsite location. There is a disaster recovery site on Staten Island (and a high speed line between the Manhattan and Staten Island offices) complete with a work area consisting of 50 workstations and this location will soon house the data center. POLICE have a 12-person IT staff that is converting the system from physical to 57 virtual servers concurrently running. Disaster recovery is tested twice each year. Penetration testing is periodically performed (not on a regular schedule). Access to network is via fingerprint (no passwords). Since 2007, backup tapes are encrypted and stored offsite at GRM. Older tapes are not encrypted and are stored onsite in a Houdini safe. Internet access is segregated from network access and VPN is not provided (except to a handful of IT employees).

During Hurricane Sandy, POLICE discovered an issue with its process: the backup servers required a manual boot up. However, no one was onsite and access to the backup servers was restricted due to the flooding. This resulted in POLICE pursuing conversion to virtual servers with the servers split between the primary location and the disaster recovery (offsite) location. The POLICE Disaster Recovery location is on Staten Island and has three sources of power supply.

Summary Evaluation: POLICE interacts well with the OA, and should pursue FTP transmission of data, if this has not already been accomplished. POLICE technology and security procedures are quite sound. Data is backed up and backup tapes are stored offsite. POLICE is extensively audited, undergoing several audits: from the Comptroller, internally, the Office of the Actuary, and from the State of New York. POLICE should share information regarding its virtual servers/disaster recovery with the other Systems. POLICE should review NYCERS paperless process to see if there are enhancements from the NYCERS System that would benefit them. POLICE should review TRS security education program to see if there is benefit in adopting a similar program.

MEETING WITH THE FIRE PENSION FUND (FIRE)

Data Processing for Valuation Files

FIRE receives data from PMS in ASCII format through SFTP and loads data into the Employee Payroll Information Systems ("EPIS"). Data integrity is checked before loading into the FDNY data warehouse database. Valuation data is handled by BTDS – a computer group that is part of the Fire Department. The OA requests salary information for FIRE active members from FISA. OA also receives from FIRE files of new members, withdrawals, member contributions and a list of vested terminated members. The OA validates the new member, withdrawal and member contribution files. The OA then uses these validated files to update the prior year's active valuation file and create a valuation file for the current year.

The OA obtains pensioner payroll information from PPMS. FIRE sends the OA a file of pensioners who terminated pension status during the year. The OA creates a Pensioner-Only/Beneficiary-Only file (PO/BO file) based on a listing of pensioners and beneficiaries who died during the year which is supplied by FIRE. The OA creates a New Pensioner file during the year as a by-product of its benefit calculation process. At valuation time, the OA validates the pensioner payroll, termination, PO/BO and new pensioner files and uses them to update the prior year's pensioner file and creates a pensioner file for the current year. The OA then conducts a comprehensive validation of the pensioner file.

FIRE examines all of the valuation data using extensive edit procedures before sending it to the OA. Data processing is usually completed in September.

Data Processing for Benefit Calculations

FIRE provides annual benefit statements to all employees via its secure Intranet, no longer in the form of a hard copy. Comprehensive information is provided, including the actual employee contribution balance, the ITHP balance, and other items. Pension estimates are also available and includes beneficiaries and Tier III Members. FIRE provides one individual counseling session at the retirement desk and also hosts monthly 5-6 hour seminars on retirement procedures/processes.

FIRE does all pension calculations other than QDRO and Option IV annuity which are calculated by the OA. The retirement process is initiated by the member who submits retirement application via chain of command – printing the required forms from the home page of the Intranet. If retirement date is the first to fifteenth of the month, they are given a partial payment at the end of that month (if sixteenth or later, partial payment at end of next month). At present, no pension is finalized until contracts are settled. Once contracts are settled, FIRE will calculate the final benefits and send each retiree their Option figures (about 8% elect options). Retirees respond within 60 days, and once received, FIRE sends the benefit calculation figures to the OA for certification via department messenger. Within 2 weeks, OA sends the certifications back. Similar to POLICE, the delay in benefit-finalization due to expired contracts result in the "death gamble" benefit being operational for a much longer time than would be the case if the contracts had been settled sooner.

MEETING WITH THE FIRE PENSION FUND (FIRE)

Security and Business Continuation

FIRE has a disaster recovery plan and backup procedures. However, tapes from the mainframe are stored in a FIRE office building one block away from the primary location. Hard copies are stored on site. FIRE's wish list includes a Disaster Recovery Site and a transition from paper physical files to electronic files.

Summary Evaluation: The recordkeeping and data collection procedures used by FIRE are generally sound and result in integrity of data provided to the OA that is generally good. FIRE follows a disaster recovery plan. However there is a problem with the storage of backed up data that is stored at a location not sufficiently distant from the primary location. In addition, due to very stringent budget restrictions FIRE sometimes finds itself short on resources.

APENDIX 2

SAMPLE EMPLOYEE RECORD ANALYSIS

SAMPLE EMPLOYEE RECORD ANALYSIS

As part of the Administrative Review, we brought sample data from the valuation files provided by the OA. The data was intended to represent a sampling of each System. The goal was to compare the data actually used in the valuation with the data that each System had on file. Data elements reviewed included dates of birth, dates of hire, salary and/or pension amounts, member contribution balances and/or annuity amounts, etc. For each meeting, GRS brought sample data for 10-15 members of the System (actives, retirees and terminated vested). At the end of each meeting, GRS worked with a designated representative of the System to review the sample data against data maintained (or accessible) by the System.

The review indicated that the data that was used in the June 30, 2010 actuarial valuation was appropriate for that purpose and was representative of data contained in each Systems' data system. We note the following three general issues:

- Some systems did not seem to have a complete record of June 30, 2010 "valuation data" provided to the OA;
- During our visit on January 16, 2014, accessing data in the past (i.e., 6/30/2010) was particularly challenging for the POLICE. Much of the sample data for the POLICE was not able to be found on site; and
- Data elements even within a particular member category (e.g., active) were often found within different databases/sources. Often times, the System representative needed to bring in other System data experts to find certain data elements (e.g., member contribution balances as of 6/30/2010).

In addition, we note the following System specific issues:

TRS

- Service amounts as of June 30, 2010 accessed by the TRS System representatives were in some cases higher than the service amounts in the GRS sample data. It was later determined that the System data reflected Chapter 126 service. The programming used by GRS to attempt to replicate TRS valuation results, adds the estimated amount of Chapter 126 service to the service provided in the OA's valuation data. Upon review of the calculated service for these individuals within the GRS valuation programs, we confirmed that there is agreement between the service accessed by TRS representatives and the service ultimately used in the TRS valuation by the OA; and
- For one of the retirees the data from the OA's valuation file indicated the percentage of benefit continued to the beneficiary was 25%. The data files accessed by the TRS representative indicated it was 5%. TRS has indicated that the member could have retired long ago prior to the implementation of UPS and the benefit might have been calculated manually and entered incorrectly since there is no payment option of 5%.

NYCERS

- For one active member the NYCERS data showed service in excess of the service in the sample data (28 years versus 19 years). The NYCERS staff indicated this member had purchased prior service that was not reflected in the data sent to the OA.

Conclusion: Data used in the valuation is appropriate for valuation purposes and is a fair representation of actual member data. We recommend the following:

- Each of the Systems should put a mechanism in place that allows for easier data verification. Since this is a routine part of the process (both for the bi-annual Actuarial Audit performed through the Comptroller's office and by each System's outside auditor), this process should be streamlined. With a streamlined process, verification could be performed at greater depths; and
- Historical information sent to the OA should be maintained until after completion of the Actuarial Audit.