



**North Dakota Public Employees  
Retirement System**

**Legacy Application System Review (LASR) Project  
Feasibility Study**



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## 1 EXECUTIVE SUMMARY

The **North Dakota Public Employees Retirement System (NDPERS)** engaged **L. R. Wechsler, Ltd. (LRWL)** to conduct a feasibility study. The objective of this report is to examine the present benefits administration system and its strengths and weaknesses to determine whether it will sustain NDPERS' business in the future, or whether it is advisable to seek an alternate solution. In the event an alternate solution is deemed essential, it will be necessary to utilize the information provided in this study to present a business case to the NDPERS Board of Trustees for moving forward with the development of a Request for Proposal (RFP) for the implementation of a replacement benefits administration solution. The results of our study and analysis are embodied in this report, the "Legacy Application System Review (LASR) Project Feasibility Study."

This report examines and summarizes the current operating environment, identifies business and technology challenges as well as documents the required operating environment. In addition, it presents the options available to NDPERS for replacing the current legacy application system, the pros and cons of each option and approach, and LRWL's recommendations.

### Current Status

NDPERS presently administers a wide range of benefits programs (see 3.1 & 4.2.1). These include:

- Six defined benefit programs
- Two defined contribution programs
- The retiree health credit program.
- Five group insurance programs including the health plan
- The Employee Assistance Program
- The FlexComp Program

The addition of these programs to the agency over time has resulted in significant growth as described in Section 4.2.1 of this report:

- Since 1966, the number of programs that NDPERS administers has grown from 1 to 20
- Since 1988, the number of members served has grown 165% from almost 40,000 to over 120,000 (this is the number of relationships with employees for each program)
- In 1995, the number of employers that NDPERS served was almost 1,000 and today the number has grown to over 1,700; an increase of 70% (again this is the number of relationships with employers for each program)

While the scope of responsibilities for the agency has grown over time, the application system that NDPERS utilizes now has been in use for over thirty (30) years (3.4). Consequently as the system has had to adapt to the changes it has become increasingly complex and very difficult to change.

We also note this growth has challenged the agency to keep up with its current business process documentation and metrics (3.2 & 3.3). While the agency has accomplished much in these areas, the pressures of having to always implement new processes with the resulting complexities associated with those implementations has limited the time available to enhance documentation and collect operating





metrics. As the agency moves forward with reducing the complexities associated with its existing business processes it should consider allocating more efforts to documentation and metrics.

In section 3.5 of the report the classification and condition of data collected by NDPERS was assessed. NDPERS' largest system resides on the mainframe; however, it was noted that a number of Microsoft Access, dBase databases, and Excel spreadsheets have been developed to supplement the functionality of the mainframe. Ten of these systems are identified on Table 7. Clearly these additional databases only add to the complexity and risk for the agency in administering its existing programs.

### **Business Issues and Challenges**

A review of the current organizational dynamics of PERS identifies three key points (4.1):

- NDPERS' staff is approaching retirement eligibility and will begin to leave employment in the next several years, decreasing NDPERS' ability to handle additional complex business procedures while maintaining customer satisfaction. In nine years NDPERS could lose 50% of its staff with 60% of today's institutional knowledge and in 15 years this rises to 72% of the staff with 87% of today's institutional knowledge. See Section 4.1.1.
- A significant amount of work is performed outside of the primary mainframe computer system using either Excel spreadsheets or database programs. This practice increases the risk that business rules will be applied inconsistently or data transferred incorrectly. As shown on the table in section 4.1.2 there are a significant number of non-integrated processes and workarounds in NDPERS current operations.
- The current technology at NDPERS has made it difficult to keep up with the agency's growth. To the extent changes have occurred they have exponentially complicated the systems and made it more difficult to continue to maintain (4.1.3, 4.2.2, 4.2.4, 4.3.1).

These organizational dynamics have raised some major business issues for the agency including:

- How is the agency going to handle future growth (4.2.1)? While it is impossible to speculate what new duties could be assigned to PERS legislatively, it is clear that just the existing responsibilities will result in increased workload in the future. As noted in 4.2.1, if existing trends are predictive of the future, the number of retirements could increase by 60% in the next five years. This increases the workload for all programs as people retire and sign up for the other programs. Additional staffing to accommodate these new clients, based upon existing business practices, would be 7 more FTEs at a cost of \$600,000 or more per biennium (4.2.1).
- Is it reasonable to maintain the current legacy system (4.2.2)? It is problematic and will inevitably become more so to maintain this system with the increasing number of retirees (4.2.1) and the near obsolescence of the technology (4.3.4, 4.3.5). This issue was discussed with ITD who also indicated that it would be difficult to maintain this system over time since the language is old, the application has key programs that need to be changed with most maintenance requests, the complexity of the system makes it more difficult to enhance the system, the current system runs on an old technology infrastructure that ITD would like to replace, the current system is not a relational database and the pool of developers is getting smaller.
- Is it prudent to continue to do many functions outside of the business application system? In order to accommodate the workload growth over the years and the limitations of the existing system, PERS has had to develop many workarounds (4.1.2). This lack of integration creates opportunities for errors (4.2.3, 4.3.3).
- Should the limitations of the existing system determine NDPERS' business systems? The current system results in: difficulty integrating new applications into the existing system such as





program enhancements (4.3.1 & 4.3.11), limitations in adding new programs (4.3.2), limitations on retention of history (4.3.6 & 4.3.8), difficulty with production operations (4.3.7), limitations on edits (4.3.10) and integration of accounting systems (4.3.12).

- Should we have employers do more direct reporting? Modern systems would have employers do more entering and verifying of data (4.2.5 & 4.3.9).

### **Required Operating Environment**

In recognition of the above business issues and challenges section 5 of the report reviews the required operating environment for NDPERS. The requirements for the retirement plans relating to account maintenance (5.2.1), account processing (5.2.2) and retiree payroll (5.2.4) are detailed. In addition the needs of the group insurance program are identified (5.2.3). Administration needs are also discussed relating to accounting (5.2.5), auditing (5.2.6), program support (5.2.7) and research (5.2.8).

### **Possible Approaches, Replacement Options and Solutions**

As noted in the above discussion, NDPERS needs to decide what to do about its aging legacy system. Our opinion and the opinion of the State's ITD is the system is old, outdated and will need to be replaced, if not now then in the near future (3-7 years). Continued investment in this system is not cost effective since it will need to be replaced. Consequently if the decision to replace were delayed, NDPERS would need to continue to do many processes manually or on spreadsheets. As new aspects are added to the existing programs, NDPERS would need to do those manually or on spreadsheets as well to avoid unnecessary investment in the existing system. The consequence is the number of workarounds and spreadsheets would grow, complexity would increase, errors could increase and financial, compliance and operational controls would weaken. The other implication of waiting is the experienced NDPERS staff may start to leave the agency as they become eligible for retirement making the complexity of the workarounds and spreadsheets harder to manage. In recognition of these issues we recommend that NDPERS move forward with replacing its business system (6.2). The following options are suggested for replacing the system:

- Build a new system through ITD or an outside vendor (6.2.2.). Based upon an estimate from ITD, the initial investment to update the system will be \$7.1 million just for the rewrite effort to update the existing system. We estimate the ten-year cost of this implementation to be \$10,800,000. To hire an outside vendor would cost approximately \$15,000,000. To build a solution also carries with it additional risk that is associated with development of a new system versus modification of an already developed system.
- Buy the solution (6.2.1). Pursuant to this approach NDPERS would buy the system from a vendor. There are approximately 6-7 vendors in the marketplace that offer such products that are presently being used by other retirement plans. We estimate the initial investment to be \$8 – 9 million and the ten-year cost of this option to be approximately \$11 million.

An adjunct decision to the “buy the solution” system replacement question, selecting the appropriate implementation strategy is also of great importance (7.1). The alternatives are:

1. A comprehensive, all-inclusive purchase (in which NDPERS would look to a single provider for all solution components and services).
2. A best of breed purchase in which NDPERS would seek to acquire and integrate a solution in each broad area of benefits functionality – e.g., a membership tracking system, a benefit payment and contribution system, an insurance billing and receivables system, a financial accounting application, a workflow management system, a Customer Relationship Management (CRM)





solution, etc. The purchase and integration could be done by NDPERS or through a system integration contractor.

3. Identification and selection of an Application Service Provider (ASP) who would host its own solution, customized and configured to NDPERS' requirements, but make access to that solution available to NDPERS staff.

In section 6.4 we outline the critical success factors (CSFs) for the project. These are the measures you will use to look back on this project when completed (should you decide to proceed) to assess how the project turned out. In section 5.5 we outline some of the concerns relating to a system replacement project: staff time, resources, training, contracting, warranty, vendor support and vendor staffing. These issues are also addressed in more detail in section 8.

In section 7 of the report, we identify the three approaches for implementation of a project. These are the big bang (implement the entire project at once), phased approach (implement over time) or reproduce current environment then expand.

### **Recommendation**

LRWL recommends that the NDPERS Board proceed with system replacement. Based on our experience with more than twenty similar public benefit re-systemization projects, should the NDPERS Board decide to proceed with system replacement, LRWL recommends buying the comprehensive, all-inclusive Line of Business (LOB) benefit solution – out of a concern for both cost and project risk. Further, although it extends the implementation timeframe and places additional requirements on staff, we believe that mandating a phased cutover approach will mitigate project risks.

Turning to the implementation effort, LRWL points out that replacing a benefits administration solution is a resource-intensive undertaking. Commitment on the part of agency management and executives to providing all of the necessary resources is critical. In that vein, LRWL recommends that a Project Management Office (PMO) with appropriately equipped space be established and dedicated for use by the entire NDPERS project team, including solution vendor personnel. The PMO, which should report to the Executive Director, would be responsible for the new benefits solution project and all supporting projects, such as workflow definition. Headed by a dedicated project manager and adequately staffed with the right NDPERS staff members (encompassing planning disciplines, technology knowledge, and subject matter expertise), the PMO would also coordinate the efforts of the NDPERS LASR Steering Committee. NDPERS estimates that it will take 4 FTEs to backfill positions during the project, at a cost of about \$161,000 per year (4-year project timeline) for two biennium. At the conclusion of the project, they also estimate they may need to retain 1-2 of the positions. We also recommend that NDPERS seek assistance from professionals with expertise and experience in Oversight Project Management (OPM), Quality Assurance (QA) support, and Independent Validation and Verification (IVV) to assist the NDPERS project manager during the new benefits solution implementation – primarily to shoulder the work load and to reduce risk.

A summary of all recommendations contained in this report can be found in Appendix E.

### **Anticipated Timeline**

Assuming a start date for the RFP development in early July, 2006, we estimate that NDPERS will be able to select a vendor and begin the new benefits solution implementation approximately eleven to twelve months following initiation of the RFP development effort – that is, May to June 2007 -. Assuming an implementation start in July 2007, the solution should be complete and entering the warranty period 30 to 36 months from the project start date – November 2009 to May 2010. Anticipated





costs for such an endeavor will vary based on the specific requirements of NDPERS and can only be determined with the release of an RFP.

In conclusion, implementation of a replacement system will:

- Provide integrated business functionality necessary to administer NDPERS' numerous benefit plans.
- Enable NDPERS to address the expected increasing workload from the aging and retiring North Dakota workforce.
- Meet its customers' ever-expanding expectations for improved services in terms of accuracy, efficiency and convenience.

The remaining portions of the report identify and discuss the issues associated with system replacement projects.





## 2 OVERVIEW

In addition to examining feasibility issues, this document presents a business case for replacing NDPERS' current legacy benefits administration system with a pre-existing, vendor developed, comprehensive administrative system<sup>1</sup>. It does so by reviewing characteristics of the current environment, discussing the challenges presented to NDPERS staff by the various disparate and disjointed administrative systems, enumerating the implementation options available for system replacement, estimating the costs anticipated for replacement of a system of this size, and identifying the vendors who provide solutions potentially appropriate for an organization like NDPERS. Finally, we provide specific recommendations for NDPERS to move forward with the replacement project.

The report is divided into three major sections. The first major section (report Sections 3 to 5), addresses the current environment, challenges it presents and a high-level description of required functionality. The second major section (report Sections 6 to 9) presents solution options, components of the solutions, the RFP development process, and project considerations and costs. Finally, in the third major section (report Sections 10 and 11), we present a budget estimate, an estimated timeline and our final recommendation. Supporting Appendices are also provided.

### 2.1 Purpose and Scope

The purpose of the report is to review the current operating environment of NDPERS, identify its business issues and challenges, determine needed system enhancements to meet those challenges and identify the options to meet those challenges along with a recommendation. The final sections of the report discuss considerations relating to moving forward with our recommendation.

The scope of this report includes an assessment of NDPERS' current operating environment and the various systems it uses to conduct and complete its day-to-day business processes. The scope also includes an assessment of the challenges NDPERS faces in completing these processes using the current technology.

The scope does not include development of additional process documentation, recommendations for any processes or "reengineering" of current business processes, or recommendations on reallocation of resources in light of a potential system replacement.

### 2.2 Objective

The objective of this document is to present NDPERS with the needed information that will enable the agency to make the decisions necessary for the agency to meet its business challenges in the most efficient manner.

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<sup>1</sup> Whether it is called a package, a template or an architecture is moot for any discussions.





## 2.3 Methodology

The methodology used to develop this document is outlined below. The tasks, which began in early-April and culminated with delivery of this document, were as follows:

1. Met and discussed with some of the NDPERS staff and management on the current business environment, including: vision and success factors, organizational challenges, data stores, current system environment, major business issues and challenges, and operating metrics.
2. Reviewed reports and documentation provided by NDPERS for material pertinent to the feasibility study.
3. Researched LRWL project archives for material relevant to replacement options, implementation approaches, component technologies, project considerations, historic costs and vendor solutions.
4. Developed material gathered through these activities into a preliminary draft document.
5. Submitted the preliminary draft to NDPERS for review.
6. Met with NDPERS to review comments, questions and changes and modified the preliminary draft as appropriate.
7. Submitted this document to NDPERS as a final deliverable for review by the Board of Trustees, management and staff.





## **3 CURRENT OPERATING ENVIRONMENT**

This section contains a description of the business components of NDPERS. During our engagement with NDPERS, LRWL held several meetings with the executive director and the managers of the NDPERS organization. During these meetings, we discussed the current state of each division and the IT systems that support those business areas.

### **3.1 Summary of Plans/Programs Administered**

The retirement plans NDPERS administers include Defined Benefit, Defined Contribution and Retiree Health Insurance Credit plans. Other benefit plans that NDPERS administers include group insurance (life, health, dental, vision and long term care). In addition to the above, NDPERS administers an Employee Assistance Plan and a Flexible Compensation plan. Each of these plans is described below. Appendix A includes statistics related to the group benefits managed by NDPERS. Appendix B includes statistics related to the retirement systems managed and administered by NDPERS.

#### **3.1.1 Defined Benefit Retirement Plans**

NDPERS administers six (6) defined benefit retirement plans. The NDPERS system includes the main (PERS) plan, judges, National Guard, and law enforcement plans and is administered in accordance with Chapter 54-52 of the North Dakota Century Code (NDCC). The Highway Patrolmen Retirement Plan is administered in accordance with NDCC 39-03.1. The Job Service Retirement Plan is established under NDCC 52-11-01 with its benefit provisions established through the plan document. Each retirement system has different contribution rates and different benefit formulas. A summary of the plan provisions for all plans is found on the NDPERS Web site at:

<http://www.state.nd.us/ndpers/active-members/index.html>

#### **Main System for Public Employees**

The NDPERS main system covers substantially all employees of the state of North Dakota, its agencies and various participating political subdivisions. This is the largest plan administered by NDPERS with the greatest number of active and retired members. It does not cover employees of the Board of Higher Education eligible for TIAA/CREF or teachers covered by the North Dakota Teachers Fund for Retirement.

#### **Judges**

The NDPERS Judges Retirement System covers the Supreme Court and District Court Judges in North Dakota.

#### **National Guard**

The NDPERS National Guard System covers National Guard Security Officers and Firefighters.

#### **Law Enforcement**

The NDPERS Law Enforcement Plan covers peace officers and correctional officers employed by political subdivisions, which have elected to offer this plan. There are two segments to this plan: one for participants with previous main system service and another for participants without main system service.





## **Highway Patrol**

The Highway Patrolmen's Retirement plan covers substantially all sworn officers of the North Dakota Highway Patrol.

## **Job Service Retirement Plan**

The Job Service Retirement Plan is limited to employees of Job Service North Dakota who were participating in the plan as of September 30, 1980. This is a closed retirement plan.

### **3.1.2 Defined Contribution Plans**

NDPERS administers two defined contribution plans. The optional Defined Contribution Retirement Plan is established under NDCC 54-52.6. This plan is available to non-classified state employees as an alternate plan to the defined benefit plan discussed above. The record-keeper for this plan is Fidelity Investments. Appendix A provides statistics on the defined contribution plan relating to participation, contributions and assets. Additional information on the plan is available at:

<http://www.state.nd.us/ndpers/retirement-plans/dc-plan.html>

The Deferred Compensation Plan is established under NDCC 54-52.2. This is a voluntary, supplemental retirement plan provided in accordance with Section 457 of the Internal Revenue Code. This plan is available to employees of the State of North Dakota and participating political subdivisions. There are currently sixteen companies providing investment services for this plan. Appendix A provides statistics on the Deferred Compensation Plan relating to participation, contributions and assets. Additional information on this plan is available at:

<http://www.state.nd.us/ndpers/deferred-comp/index.html>

### **3.1.3 Retiree Health Insurance Credit Program**

The Retiree Health Insurance Credit Program is designed to provide members with a benefit that can be used to offset the cost of their health insurance premiums during their retirement years. It is available to all members of the above retirement plans who purchase their insurance through the NDPERS Group Insurance Plan. Appendix A provides statistics on the plan relating to participation, contributions and assets. Additional information on the plan is available at:

<http://www.state.nd.us/ndpers/health-credit/index.html>

### **3.1.4 Group Insurance**

The NDPERS administers the health, life, dental, vision, long term care, and employee assistance plans for the State of North Dakota and participating political subdivisions. The Group Insurance plans are administered according to NDCC 54-52.1.

#### **Group Health**

The Uniform Group Health Insurance Plan is a fully insured plan with BCBSND, effective July 1, 2005 and ending June 30, 2007. All state employees are covered under the plan, including the staff at colleges and universities. Political subdivisions may also participate in the health plan at their option. In addition, retirees, receiving a retirement allowance from NDPERS, ND Highway Patrol, Job Service, Teachers Fund for Retirement and TIAA/CREF can participate in the group health plan. Also, members of a political subdivision, if enrolled in the plan as an active employee and receiving a retirement allowance





from an approved employer sponsored retirement plan are eligible. A surviving spouse is eligible if receiving a beneficiary benefit from one of the above retirement plans or are on the plan as a covered dependent at the time of member's death. Appendix A provides statistics on the plan relating to participation and premiums. Additional information on the plan is available at:

<http://www.state.nd.us/ndpers/insurance-plans/group-health.html>

### **Group Life**

The Uniform Group Life Insurance Plan is a fully insured plan underwritten by Prudential, effective July 1, 2005 and ending June 30, 2007. All state employees are covered under the plan, including the staff at colleges and universities. Political subdivisions may participate in the life plan at their option. In addition, retirees receiving a retirement allowance from NDPERS, ND Highway Patrol, Job Service, Teachers Fund for Retirement and TIAA/CREF can participate in the group life plan. Appendix A provides statistics on the plan relating to participation and premiums. Additional information on the plan is available at:

<http://www.state.nd.us/ndpers/insurance-plans/group-life.html>

### **Dental**

The Uniform Group Dental Plan is fully insured by ReliaStar, effective January 1, 2006 and ending December 31, 2006. This plan is available to employees of state agencies and higher education, as well as retirees receiving an allowance from an eligible retirement system. Appendix A provides statistics on the plan relating to participation and premiums. Additional information on the plan is available at:

<http://www.state.nd.us/ndpers/insurance-plans/dental-plan.html>

### **Vision Plan**

The Uniform Group Vision Plan is fully insured by Ameritas, effective January 1, 2006 and ending December 31, 2006. This plan is available to employees of state agencies and higher education, as well as retirees receiving an allowance from an eligible retirement system. Appendix A provides statistics on the plan relating to participation and premiums. Additional information on the plan is available at:

<http://www.state.nd.us/ndpers/insurance-plans/vision-plan.html>

### **Long Term Care Plan**

The Uniform Long Term Care Plan is fully insured by UNUM. There are approximately 50 participants in this plan. This plan is available to employees of state agencies and higher education and their spouses, as well as retirees and their spouses. Additional information on the plan is available at:

<http://w3.unumprovident.com/enroll/NDPERS/index.htm>

## **3.1.5 Employee Assistance Plan**

The Employee Assistance Program, or EAP, covers employees of state agencies and higher education. This program allows employees to receive confidential assistance in many areas without accessing the health care system. NDPERS has contracted with three EAP vendors to provide services to employees and their families. Appendix A provides statistics on the plan relating to participation and premiums. Additional information on the plan is available at:

<http://www.state.nd.us/ndpers/eap/index.html>





### 3.1.6 Flexible Compensation (FlexComp) Plan

The FlexComp plan is established under NDCC 54-52.3. This plan is available to state employees. District health units may participate in the FlexComp plan at their own option. The plan allows participants to elect to reduce their salaries to pay for qualified insurance premiums, medical expenses, and dependent care expenses on a pretax basis. Appendix A provides statistics on the plan relating to participation and deferrals. Additional information on the plan is available at

<http://www.state.nd.us/ndpers/flexcomp/index.html>

## 3.2 Current Business Process Documentation

As part of the feasibility assessment, LRWL performed a high level review of the process documentation available at NDPERS. The objective of the review was to determine what documentation exists and how valuable it would be in the following circumstances:

- Operationally, as used by NDPERS:
  - ✓ For new employee training
  - ✓ For new employer training
  - ✓ As material to facilitate staff training and resumption of operations in the event of a disaster.
- During an RFP and system development process:
  - ✓ Providing an outside vendor an adequate understanding of the NDPERS business processes in order to accurately scope the project
  - ✓ Provide a source of 'as-is' documentation.

LRWL used the following criteria to evaluate the existing documentation:

- **Readability** – Does the documentation provide clear and simple directions for how to perform processes necessary to accomplish the business function? Does the documentation actually describe the process rather than just duplicating tables, spreadsheets, forms, letters, and reports?
- **Thoroughness** – Does the documentation cover the entire process and include user directions, examples of input and output forms, letters and reports, and how the process fits into the overall scheme of the business function?
- **Format** – Is all process documentation created consistently? Is the format of each document well organized, easy to follow, consistent in depth of information provided?

The NDPERS documentation that LRWL reviewed was found on the LAN. The documentation was organized in folders named with each employee's LAN User ID. Each folder contained the documentation the particular employee developed for the functions he/she performs. Using the three (3) criteria defined above, LRWL ranked the documentation for each business function with a value from 1 – 5, with 1 being the least useful and 5 being the most useful. The following table presents our assessment of the business process documentation at NDPERS.





**Table 1 - Usefulness of Existing NDPERS Documentation**

<b>Business Area within NDPERS</b>	<b>Business Function Name Used by LRWL</b>	<b>Documentation Exists? (Yes or No)</b>	<b>LRWL Valuation of Usefulness</b>
Accounting	Employer Reporting (Transmittals)	Yes	3
Accounting	Tax Reporting	Yes	2
Accounting	Vendor Payments	No	1
Accounting	Funds Management	Yes	2
Accounting	Member Account Maintenance	Yes	3
Accounting	Group Insurance	Yes	3
Accounting	Group Insurance Billing	Yes	3
Accounting	Individual Insurance Billing	Yes	3
Accounting/IT	Actuarial/Statistical	Yes	3
Administrative Services	Imaging	Yes	3
Benefit Programs	Employer Maintenance	Yes	3
Benefit Programs	Member Enrollment	Yes	3
Benefit Programs	Member Counseling	Yes	3
Benefit Programs	Refunds/Rollovers/TIAACREF	Yes	3
Benefit Programs	Purchase of Service Credit	Yes	4
Benefit Programs	Benefit Estimates	Yes	3
Benefit Programs	Retirement Application & Processes	Yes	3
Benefit Programs	Disability Application/Appeals	Yes	3





Business Area within NDPERS	Business Function Name Used by LRWL	Documentation Exists? (Yes or No)	LRWL Valuation of Usefulness
Benefit Programs	Dual Membership Retirements	Yes	3
Benefit Programs	Death Benefits	Yes	3
Benefit Programs	Power of Attorney	Yes	3
Benefit Programs	QDRO	Yes	3
Benefit Programs	Deferred Compensation	Yes	3
Benefit Programs	Benefit Division Procedures	Yes	3
Benefit Programs	FlexComp	Yes	3
Benefit Programs	Job Service Retirement	Yes	2
Benefit Programs	Return to Work	Yes	3
Benefit Programs	Retiree Health Insurance Credit	Yes	3
Benefit Programs	Wellness Program (New Program)	No	1
Benefit Programs/IT	Benefit Payroll (Crossover and Check-write)	Yes	3
IT	Member Statements	Yes	2
Development/Research	General/Ad hoc Reporting	Yes	4
Member Services	Member Activity Tracking / Contact Management (CRM)/ Training Manuals	Yes	3

In summary (although the ranking is certainly subjective), there are 2 areas where no documentation was found during the review, 4 with a value of 2, 25 with a value of 3, and 2 with a value of 4. While this points to documentation that is not perfect, the documentation available is above average for organizations the LRWL has reviewed.





Documentation of the current system is needed for several reasons including training staff and inclusion in the system replacement RFP of current business processes. In the former case, its value is self-evident. In the latter case it can help the vendor understand the current system better and sets a bar or level of expectation of the vendor for functionality to be delivered within the application. It can essentially work as a safety net for the functionality delivered. In addition, if it is developed well, it can be a good resource for any workflow development effort included in the system replacement effort.

At the same time, developing the documentation can be a resource intensive task and become a low priority for an organization with limited resources.

### **3.3 Operating Metrics**

One of the most effective ways to determine whether an organization's goals and objectives are being attained is to define a set of metrics and measure against them. In the following sections, we discuss the metrics available and collected in the current system, as well as those which NDPERS might consider including for use before and after the implementation of a new line of business (LOB) benefit solution to measure the improvement attained.

#### **3.3.1 Current State of Operating Metrics**

During our review of NDPERS' operations, we have seen only one periodic management report which can be used to gauge the status of operations to determine whether the workload is static, increasing or decreasing. The reports we have seen provide monthly counts and the annual summaries of various tasks performed within each functional area of the organization. The types of tasks counted include:

- Telephone calls (by plan)
- Interviews (appointments and walk-ins by plan)
- Group Insurance functions (by task)
- Retirement functions (by task)
- Deferred Compensation functions (by task)
- FlexComp functions (by task)
- Administrative operations (by task)
- Records Center functions (by task)
- Member Services functions (by task).

The metrics have been collected since 1993. In communications with the Board of Directors and the Legislature, NDPERS management uses this data to present trends in workloads experienced by NDPERS. This is important when submitting and justifying budget and personnel requests.

#### **3.3.2 Recommendation Related to Operating Metrics**

LRWL recommends that more statistical information be collected (e.g., number of tasks performed by staff member, time required to perform like tasks and number of tasks left undone at month-end – i.e., backlog). We believe that such measurements and reports are essential for three reasons:

- To measure the current health of the organization,
- To provide employees with a quantifiable means of measuring their efforts, and
- To serve as a baseline against which the new LOB solution can be measured.

Metrics should be collected at several levels. First, metrics should be collected over time to demonstrate any trends that are evident or later become evident. Second, metrics should be collected at the specific process level to measure efficiency of group and/or individual performance. Examples of some typical





metrics are shown in Figure 1 and Figure 2 on the following pages. Note that no one client has ever implemented all of the metrics included in the sample tables. They represent a compendium. Most clients select a few in each area that are the most important to them to start – often refining the selection of appropriate metrics as more is learned from the review of the data initially collected.

**Figure 1. Examples of Production Metrics Used to Gauge Project Success**

<b>PRODUCTION METRICS</b>						
	<b>Current Period</b>	<b>Same Period Last Year</b>	<b>% Change</b>	<b>Year-to-Date</b>	<b>Year-to-Date Last Year</b>	<b>% Change</b>
<b>Completed Activities</b>						
Service Retirements						
Disability Retirements						
Service Credit Purchases						
Adjustments						
Membership applications						
Refunds						
Member Inquiries						
Reprint Member Annual Statements						
Reprint 1099s						
<b>Totals</b>						
<b>Backlog</b>						
Number of Service Retirements						
Number of Disability Cases						
Number of Service Credit Purchases						
Number of Adjustments						
Number of Membership Applications						
Number of Refunds						
Number of Member Inquiries						
Reprint Member Annual Statements						
Reprint 1099s						
<b>Totals</b>						
<b>Statistics</b>						
New Members						
Death Claims						
Total Membership						
<b>Miscellaneous</b>						
Wage and Contribution Reports Completed						
Wage and Contribution Reports in Process						
<b>Other</b>						





**Figure 2. Examples of Efficiency Metrics Used to Gauge Project Success**

<b>EFFICIENCY METRICS</b>					
		<b># In Queue at Start of Period</b>	<b># In Queue at End of Period</b>	<b># Completed This Period</b>	
	Service Retirements				
	Disability Retirements				
	Service Credit Purchases				
	Adjustments				
	Membership applications				
	Refunds				
	Member Inquiries				
	Reprint Member Annual Statements				
	Reprint 1099s				
<b>Totals</b>					
<b>WORKFLOW METRICS</b>					
		<b>Target Cycle Times</b>	<b>Actual Cycle Times</b>		
			<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>
	Service Retirements				
	Disability Retirements				
	Service Credit Purchases				
	Adjustments				
	Membership applications				
	Refunds				
	Member Inquiries				
	Reprint Member Annual Statements				
	Reprint 1099s				

LRWL recommends that NDPERS develop and maintain customer service metrics to measure their level of service for both active members and retirees, if only for those processes that have the greatest impact on the largest population of members/retirees. While changes in the actual quantities of transactions to be processed are not under the control of NDPERS, the throughput metrics for those transactions will provide a measure of how the new system compares with the current one. At a minimum, we believe that NDPERS should select suitable metrics to assess the time required for the following processes and to provide a count of transactions in these categories not processed at the end of a processing period (i.e., the backlog; NDPERS does not currently have a backlog in any of these areas, but this type of metric would identify a backlog if one does occur):

- Retirement applications
- Refund applications
- Disability applications
- Requests for benefit estimates





- Purchase of service requests
- Enrollment and dis-enrollment

In contrast to production and efficiency metrics (discussed above), accuracy metrics are difficult to measure - manually or automatically. However, they are perhaps the best measure available of the *quality* of the service provided by NDPERS. For example, the Member Services worker who closes the most calls per period may not do the highest quality job – when quality is defined as the call resulting in a satisfied member who does not come back for an answer to the question originally asked, but will happily come back for the answer to a new question in the future.

Figure 3 below provides a relatively simple measurement of accuracy in the processes being counted and measured in the tables above.

**Figure 3. Sample Accuracy Metrics**

<b>ACCURACY METRICS</b>					
		<b># Completed This Period</b>	<b># Completed in One Pass</b>	<b># Requiring Rework</b>	<b>% Correct in Single Pass</b>
	Service Retirements				
	Disability Retirements				
	Service Credit Purchases				
	Adjustments				
	Membership applications				
	Refunds				
	Member Inquiries				
	Reprint Member Annual Statements				
	Reprint 1099s				

NDPERS is already accustomed to the process of collecting instances of specific identified work processes and storing these counts in an Excel spreadsheet. A replacement LOB solution could integrate the collection of such information for workflow reporting, loading “data cubes” and “automatically” generate informative reports and trend graphs. A reporting tool such as Crystal Reports can be used to provide additional ad-hoc reports via the data cube.

One benefit of installing a new LOB solution is that NDPERS can specify that the system include the production and efficiency data metrics mentioned above. In addition, the new system can be designed to supply measurements which can be used to characterize the accuracy of staff member’s work.

The distinction between those metrics available initially and those that NDPERS may eventually wish to obtain is important. Often clients, when installing a new LOB solution, start with a relatively simple set of metrics – and only after a year or two of operation do they begin to understand what other metrics they want to gather. Some have gone so far as to implement a data warehouse, data cube, or repository in which they collect all the data pertinent to the system as well as all the data they can about the operation of the solution. With all the power of analysis which this brings to bear, clients can later mine their data for insights not previously considered. Note that the key is, first, that the new system has the ‘instrumentation’ tools available – and, second, that standards for instrumentation of all processes be defined and identified in the RFP and the proposed solution – and, third, that appropriate representative metrics be collected and presented.





## 3.4 Current System Environment

This section describes NDPERS' current IT environment.

### 3.4.1 Overview of Organization and Functions

The direct responsibility for steering and implementing Information Technology functions lies with the IT Steering Committee. The IT Steering Committee consists of:

- Executive Director
- Program Development and Research Manager
- Employee Benefit Programs and Human Resource Manager
- Accounting Manager
- Administrative Services Manager
- IT Coordinators
- Benefit Services Specialist
- Three (3) Benefit Programs Administrators.
- Internal Audit

NDPERS utilizes hardware and legacy software housed and maintained by the ND Information Technology Department (ITD). In addition, NDPERS uses PeopleSoft HR/Payroll and Financials. The legacy system components housed by ITD are supplemented by several in-house database and spreadsheet applications supported by NDPERS staff. NDPERS maintains and supports its own local area network servers. When the need arises, NDPERS calls the appropriate manufacturer, vendor or business partner for technical assistance and/or troubleshooting.

### 3.4.2 Technical Environment

This section documents the technical environment by categorizing the system and application environment into five (5) sub-systems hosted by ITD

- Legacy System Application Software housed at ITD
- Hardware and System Software
- Security and Privacy
- Email and Calendaring
- Electronic Document Management

#### 3.4.2.1 Legacy System Housed at ITD

NDPERS' benefits application was developed using the COBOL and Natural programming languages for interfacing with the Adabas database and running batch processes. The application now resides on an IBM mainframe. However, ITD is in the process of moving these mainframe applications to a cluster of Linux servers that will also be housed and supported by ITD.

The function of the benefits application is to collect and manage member and employer information so benefits can be properly disbursed. As new program responsibilities have been assumed by NDPERS, they have been handled with changes made to the legacy application system or additional applications that have been developed to run on the NDPERS LAN.

#### Database





Following a review of the database structures and interviews with NDPERS personnel, it was determined that the current mainframe applications do not consistently take advantage of typical Relational Database Management System (RDBMS) features such as data normalization. As an illustration, fields are duplicated across tables and related data fields are not always grouped together appropriately in a single table. The result is an inefficient database and table design. Consequently, absent a redesign of much if not all of the database structure, staff members are forced to develop more complex program code and implement workarounds to accomplish modest operating goals. In doing so, data integrity is compromised. Even more problematic, after twenty plus years of changes and enhancements being made to the legacy system, every additional enhancement makes the application more difficult to maintain and enhance in the future, restricting the options available as future needs change.

In addition, in our experience, locating and retaining knowledgeable, experienced Adabas programmers is equally as challenging as retaining COBOL programmers (see below).

### **Language**

The application's underlying programming languages are COBOL and Natural. These languages, while powerful and still in use in many mainframe-based applications, were developed over thirty years ago for use primarily in transactional systems. They do not support the constructs of today's more object-oriented languages, nor are they the languages of choice in the highly interactive application world of the early twenty-first century, i.e., Web-facing. ITD has difficulty recruiting and retaining staff proficient in using the COBOL and Natural languages. As a consequence, modifications or enhancements to the legacy applications often result in errors in seemingly unrelated areas of the application and require inordinate amounts of NDPERS staff time for testing and remediation.

### **Analysis**

NDPERS IT Coordinators analyze each new maintenance effort required in the legacy solution. After completing the analysis, the assigned IT Coordinator explains to an ITD resource what is needed to accomplish the required change. Any misunderstandings between the NDPERS managers or users and the IT Coordinator, or between the NDPERS IT Coordinator and ITD staff, may not be identified until testing. This problem can prolong the time needed to accomplish a given task, as well as making the task very difficult and expensive to complete, since correcting problems is more difficult and time consuming when they are identified during testing, rather than during analysis or design. (As a requirement of the system replacement process, best practices would have NDPERS require a design document from the vendor and a walk-thru of same in order to confirm the requirements prior to any coding. Doing so would reduce the risk of receiving functionality that does not address business requirements.)

### **Testing**

NDPERS staff tests all changes or enhancements to the legacy solution. NDPERS has determined that, with inexperienced programmers making the changes, errors are often introduced as a result of misunderstandings about the change needed or errors in programming. As described earlier, because of the complexity of the system, minor changes in one place often result in errors in another. This makes testing, and particularly regression testing, of changes excessively time-consuming.

Current problems relating to the four topics presented above (database, language, analysis, and testing) present serious roadblocks to:

- Significant enhancement of member and retiree service capabilities
- Increasing the efficiency of processing member and employer contribution data
- Minimal response to on-going legislative changes.





### **3.4.2.2 Hardware and System Software**

NDPERS utilizes hardware and software that are housed at the statewide facility (ITD) and at the NDPERS offices. The sections presented below outline the capabilities of both locations.

#### **3.4.2.2.1 HOUSED AT ITD**

North Dakota's technical environment consists of Windows-based desktops and a variety of server platforms connected via an IP based network. Desktop support is provided by the individual state agencies with the ITD providing the statewide network and support for the majority of the server platforms. Brief descriptions of each component are provided below.

##### **Network Services**

ITD provides both local and wide area network services for state government. All LAN segments are switched 100-megabit Ethernet networks. The Fargo and Bismarck metropolitan area networks are gigabit fiber based, while the majority of WAN connectivity is obtained via ATM T1s. The core of the WAN consists of a SONET ring. End user support is provided through a central help desk. The help desk service is available 24x7x365 (with on-call support during non-business hours).

##### **Directory Services**

ITD provides a single Active Directory network domain that in sum provides agencies with a single network sign on. This capability offers “push” technology for the distribution of applications to user workstations, while allowing for ready management of the network and local control. ITD uses Active Directory to provide security and authenticate users of the State’s Wide Area Network. Each agency comprises an Organizational Unit (OU) within NDGOV. ITD provides the necessary Domain controllers and Global Catalog servers for authentication services.

In addition, ITD provides Lightweight Directory Access Protocol (LDAP) directory service using the IBM SecureWay product to provide authentication and authorization for Web applications. This LDAP directory is also used to provide authentication for the ITD-managed file transfer protocol (FTP) server.

##### **Hosting Services**

The majority of state agencies receive hosting services from ITD, as this is a requirement of the North Dakota Century Code. ITD and the Office of Management and Budget (OMB) must approve any official waiver. These services are provided through the following platforms:

- An IBM z800 mainframe running zOS version 1.4
- An IBM iSeries, model 820 running OS version 5.2
- Windows servers with Windows 2000 Server being the preferred OS (Windows 2003 will be deployed gradually over time)
- Sun Solaris servers
- Intel RedHat Linux servers.

End user support is provided through a central help desk. The z800 mainframe provides CICS for transaction management. (ITD is phasing out the mainframe, and NDPERS mainframe applications will be ported to Linux servers. This will be a straight port, rather than a code change or rewrite.)

##### **Database Services**

The majority of state agencies receive database services from ITD. The following databases are supported:





- Software AG's Adabas which is hosted on the z800 mainframe
- IBM DB2, version 7.2 which is hosted on the z800 mainframe
- Oracle 9i which is hosted on a Sun Solaris cluster
- Microsoft SQLServer 2000 which is hosted on a Windows 2000 Server cluster.

ITD provides both test and production database environments. Dedicated, or stand-alone, installations of these databases are actively discouraged.

### Web Environment

ITD provides both clustered .NET and J2EE Web application environments. Test and production environments are provided. The J2EE platform consists of IBM WebSphere version 5.1 running on RedHat Linux. Load testing of any Web application is required prior to production deployment and is highly recommended during application development. ITD uses Mercury Interactive's LoadRunner software to perform load testing and Segue for automated application testing.

### Data Backup

IBM's Tivoli Storage Manager provides backup services.

#### 3.4.2.2.2 HOUSED AT NDPERS

An inventory of workstations indicates there are approximately 32 clients of which thirty are running Windows XP and 2 running Windows 2000. Thirty of the 32 are HP/Compaq Model DC7100CMT with a P4 3.20GHz processor, 1 GB of memory and a 40GB hard disk with the exception of IT Coordinators and Research Analyst which have 80GB hard disk. The other two workstations are Gateway-brand systems with 1.0GH processors, 256MB memory and 19GB hard disk. All 32 workstations have Workstation IDs sequentially numbered from ERN01001 to ERN01032. There is an additional computer in the mailroom not on the LAN. It is a Gateway M1000 with 1.0GH processor, 256MB memory 19GB hard disk. In addition, there are five laptop computers. Three of the laptops run Windows 2000 and two run Windows XP.

An inventory of servers is provided in Table 2:

**Table 2 - Inventory of NDPERS Servers**

OS	Workstation ID	Model	Location/Function
W2000	ERSERVER1	Gateway A7400	Computer Room
W2000	ERSERVER2: 28.8 Ex. Modem (Boca) Smart UPS UPS (BC 750)	Gateway E4200	Computer Room

The replacement strategy for the computer equipment residing at NDPERS is:

- Desktop PCs/ Laptops – replace every four (4) years
- Windows Servers – replace every four (4) years

NDPERS current inventory of printers is provided in Table 3:

**Table 3 - NDPERS Current Printer Inventory**

MAKE	MODEL
Cannon	3300





MAKE	MODEL
Cannon	8500
HP Color	LaserJet 4550
HP	8100DN
HP	8150DN
Epson	8500
HP	DeskJet (3)
Epson	Dot matrix
Cannon FilePrint 250	250
HP Deskjet	3820

Some of the applications currently installed on or accessible through the NDPERS workstations are presented in Table 4:

**Table 4 - Major Applications Supporting NDPERS Current Operations**

Application	Purpose	Category	Platform/Language/Database
Retirement	Track member, employer and retiree information and perform all critical functions for the administration of the retirement plans, including that for benefit payroll.	Custom	IBM z800/COBOL-Natural/Adabas
PeopleSoft Financials	GL, vendor payments, fixed assets, and purchasing	Package	Windows 2003/SQL Server 2000/Web Server is RedHat Linux
PeopleSoft Human Resources Management System	Employee payroll	Package	Windows 2003/SQL Server 2000/Web Server is RedHat Linux
PeopleSoft FSA	FlexComp	Package	Windows 2003/SQL Server 2000/Web Server is RedHat Linux
Group Insurance	Track member, employer and retiree information and perform all critical functions for the administration of the Group health & life Insurance Programs	Custom	IBM z800/COBOL-Natural/Adabas
Deferred Compensation	Track member, employer, retiree and provider information and perform critical functions for the administration of the Deferred Compensation Program	Custom	IBM z800/COBOL-Natural/Adabas
Dental ACH Tracking	Tracking of ACH debits for Dental insurance	Custom	Windows XP VDM/ dBase/dBase
Vision ACH Tracking	Tracking of ACH debits for Vision insurance	Custom	Windows XP VDM/ dBase/dBase





Application	Purpose	Category	Platform/Language/Database
Deferred Comp Provider Reporting	Employee contributions are downloaded from the mainframe; then formatted and submitted to the various providers	Custom	Windows XP/VBA/Microsoft Access
Print 1099Rs	Tax information for disbursements is downloaded and the 1099-Rs are printed and data is sent to the IRS	Custom	Windows XP/Visual Basic/Access
Job Service Retirement System	The system supports contribution reporting, refunds, annual member statements, benefit estimates and actuary census data for the Job Service Retirement System	Custom	Windows XP/VBA/Microsoft Excel
Monthly Zero Beneficiary Reporting	This dBase application performs a download from the mainframe of member information on an ad hoc basis. The application produces a list of members of retirement plans or group insurance plans who have not designated a beneficiary. The list of members is sorted by employer. The lists are then sent to the employers.	Custom	Windows XP VDM/ dBase/dBase
Internal Audit Test of Benefits	This dBase application produces a download from the monthly benefit payment system. The download consists of a random sampling of the monthly benefit payments produced by the retirement system. The NDPERS internal auditor then audits the benefit payments for accuracy.	Custom	Windows XP VDM/ dBase/dBase

Other software tools in use are presented in Table 5:

**Table 5 - Additional NDPERS Software Tools**

Application	Purpose	Developer	Platform
IBM Host Ondemand	Remote access/ with supervisor permissions	IBM	Web
Visio 2002/XP	Diagramming	Microsoft	Desktop (Windows 2000/XP)





Application	Purpose	Developer	Platform
MS Office 2003	Word Processing, spreadsheet, database, email, calendar, etc	Microsoft	Desktop (Windows/XP)
Macromedia Dreamweaver Studio	Web Design and Development	Adobe	Desktop (Windows/XP)
Adobe Acrobat	Create PDF Documents for the Web	Adobe	Desktop/Windows
SAS	Statistical analysis	SAS	Desktop/Windows
ACL	Auditor tool	ACL	Desktop/Windows
AllClear	Flow Charting Software	AllClear	Desktop/Windows
Attachmate Extra	Mainframe Emulation	Attachmate	Desktop/Windows
Entire Network	ODBC Connection to Adabas	SoftwareAG	Desktop/Windows
Oracle Client	Connection to ND Login Data	Oracle	Desktop/Windows

### **3.4.2.3 Security and Privacy**

NDPERS has a high sensitivity to data security issues, especially those related to personally identifiable information, such as Social Security numbers and overall privacy and identity security. Due to this sensitivity NDPERS is continually updating and enhancing security efforts.

While providing more robust, richer, and more user-friendly applications, using the Internet for communication with employers and members increases the potential exposure of member data. NDPERS continues to be concerned about the security of data exchanged during the use of Web-based applications. For that reason, NDPERS supports a secure Web site for the transfer of employer and employee data, ensuring the confidentiality of all data transmitted via the application.

However, data transmitted via email remains vulnerable. The design of any future Web-based applications must address this concern in a comprehensive fashion. To overcome this security issue, other agencies have restricted the use of email to announcing the publication of information at a secure site to which the user or employer must log in.

In addition, the use of the member Social Security number in any published communication – either hardcopy or electronic – may soon be prohibited by federal law. NDPERS has taken steps to help ensure that members' Social Security numbers are not visible in postal mailings and are never provided in electronic communications. This effort will continue and should be enhanced and periodically reviewed at the highest levels in NDPERS.

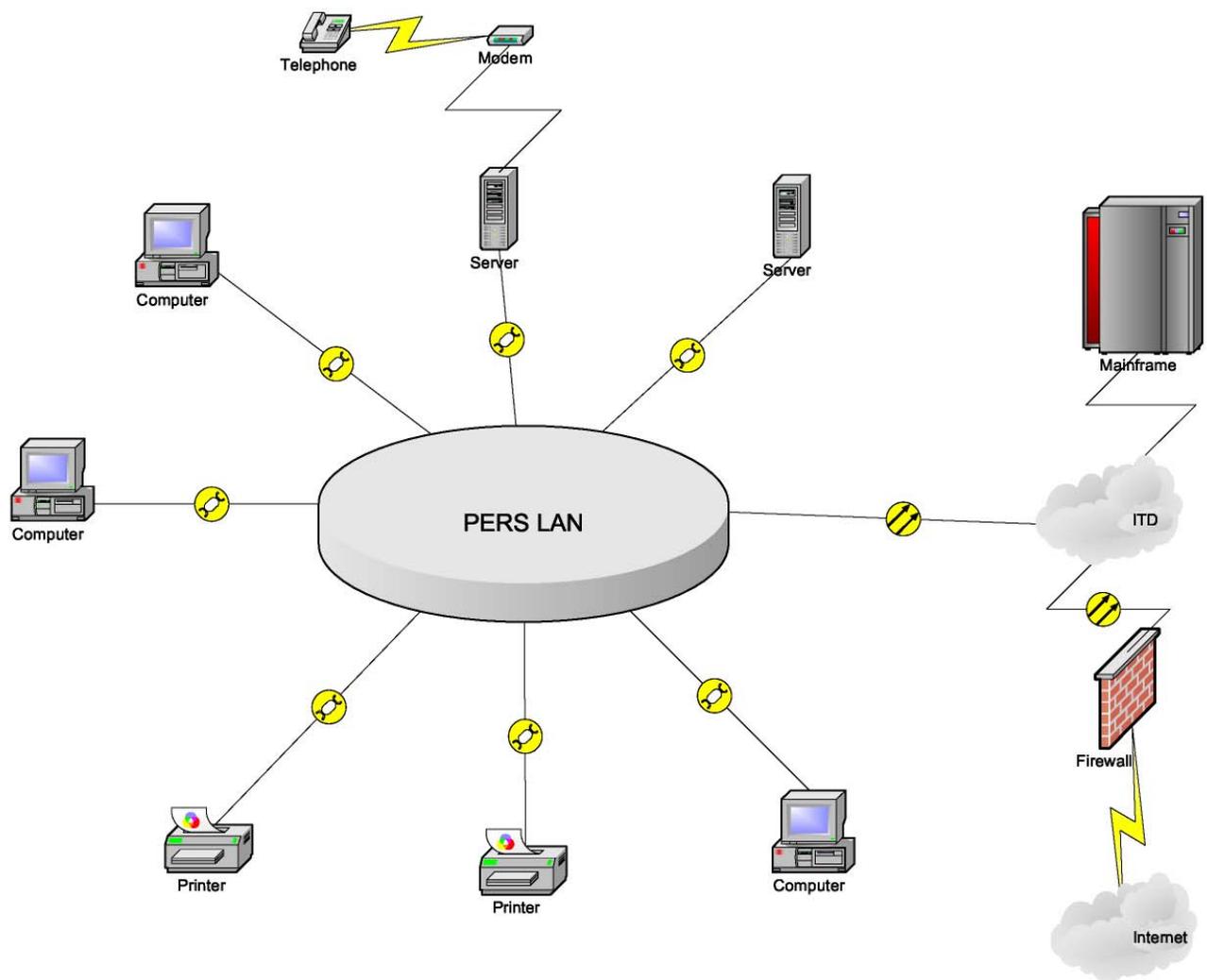
The State of North Dakota Login ID allows access to secure Web sites and applications. NDPERS uses the ND Login ID as well as other credentials to allow access to member information. The NDPERS Web site also allows employers and members to establish user IDs and passwords to access the secure information available through the Web.

The diagram on the following page (Figure 4) provides a view of the NDPERS LAN Environment.





**Figure 4. NDPERS Network Diagram**





#### **3.4.2.4 Email and Calendaring**

NDPERS currently uses Microsoft Exchange and Outlook for email and calendars. ND ITD administers Microsoft Exchange, while Outlook is administered by NDPERS.

#### **3.4.2.5 Electronic Document Management (EDM)**

Until the mid-70's, NDPERS maintained all of its records on paper, physically retrieving the member file whenever it was needed for processing. Paper documents were added to the file as they were received and processed, or as they were internally generated. In the mid-70's, NDPERS began using microfiche to maintain the member and employer files, as well as historical copies of some Retirement System reports.

In 2002, NDPERS adopted FileNet (maintained by ITD) to support electronic filing. NDPERS continued to process from paper documents, which were imaged and indexed to the member folder after processing was completed (i.e., backend processing). Currently, NDPERS is confident that the critical information for each member is stored on either the microfiche or the imaging system. The paper files for FlexComp claims (dating prior to 2002) are stored off site for record retention purposes.

NDPERS intends to consider integrating the FileNet imaging system with the future benefit application and utilizing the workflow component of FileNet (also maintained by ITD), thus largely eliminating the need to refer to or handle paper documents.

#### **3.4.2.6 Conclusion**

Our review of the technical environment provided us with an understanding of what operating capabilities NDPERS currently has – in terms of hardware, software, security and connectivity – and some of the challenges it currently faces. Our concern is not so much with the hardware itself but, rather, with the fragility and difficulty of maintaining the collection of legacy applications that make up NDPERS' line-of-business solution.

In addition, maintenance of the legacy applications via the COBOL and Natural languages and the Adabas database, on which the applications are based, has become increasingly more difficult. This is not only because of the challenge of finding quality COBOL and Natural programmers, but also because of the age, complexity, and amount of maintenance and changes made. This introduces the challenge of confidently modifying program code without precipitating some undesired effect within the application. Changing a line of code, unbeknownst to the programmer, often introduces flaws in some other remote and tangentially related process. As the code is continuously altered to address requested enhancements, it becomes more difficult to change without significant risk to program failure. This poses a serious impediment to NDPERS and their requirement to have much of the functionality needed to administer their various benefit plans under one umbrella application.

### **3.5 Data**

This section reviews the classification and condition of data collected by NDPERS in an effort to assess what challenges it presents to NDPERS and how an integrated system hosted within a modern database structure might eliminate or minimize these challenges.

NDPERS' largest systems reside on the mainframe and consist of the database and major business applications for the retirement, group insurance, retiree health credit, and deferred compensation programs. These programs include the online system as well as batch jobs and have been developed using the COBOL and NATURAL programming languages. Software AG's Adabas is used as the data store. Batch job setup and scheduling is also performed via the mainframe in the TSO environment.





NDPERS IT staff and the Research Analyst use the mainframe for development of ad-hoc reports and queries using the NATURAL programming language.

### 3.5.1 Current LOB File Groups

Files in the current LOB solution generally fall into one of four groups:

- Employer files
- Retirement system files (including Defined Benefit, Defined Contribution, Deferred Compensation, Group Insurance and outstanding check files)
- Tax files
- Account and actuarial files.

All current LOB files will require conversion to the new benefit solution environment.

During our review we observed a number of concerns that generally fall under the category of “database normalization.” Database normalization refers specifically to eliminating redundancy in a database, but can be interpreted more broadly to include the efficient and effective storage of an organization’s data. A normalized database is arguably easier for developers to manipulate and maintain and provides more predictable results than a database that is not normalized. Adabas tables residing on the mainframe are presented in Table 6.

**Table 6 - NDPERS Mainframe Adabas Tables**

Adabas Table Number	Adabas Table Name	Brief Description
57	Imaging System Index File	Indexes to member and employer images
58	State Retirement Table Master	Stores Table Information, including that for: Group Insurance rates, Tax table information, Alternate Keys, actuarial factors for benefit options.
59	State Retirement Master File	Member/Retiree information, including that for: Demographic, Family, Employment, Salary, Contribution, Interest, Benefit (for retirees), Beneficiary, Benefit Payment History, Group Insurance, Dual Service, Reduced Benefit, and Alternate keys.
60	State Retirement Dept. Master	Employer (Department) Information
61	Benefit Letters Temp. File	Temporary file used to print benefit letters
65	State Retirement Deferred Comp Master File	Deferred Compensation Participant Information, including that for: Demographic, Provider, Termination, Beneficiary (Prime), Beneficiary (Contingent), Contribution history and Alternate Keys.
66	State Retirement Deferred Comp Provider File	Provider information for all Deferred Compensation providers
69	State Retirement Deferred Comp Agent File	Information for all authorized agents of the Deferred Compensation providers
114	Checkbook Accounting Master	Monthly retirement benefit payment information





<b>Adabas Table Number</b>	<b>Adabas Table Name</b>	<b>Brief Description</b>
122	Utility Systems Data	Retiree and Group Insurance rate information

In our review of the files and tables with NDPERS staff, it appeared that in some cases the same data item is stored in more than one file and under more than one application. Storing the same data item in multiple locations introduces the opportunity for the data to fall out of synchronization and for the database to lose its integrity.

Observations made during the review of each of the four file groups are identified in the following subsections.

### **3.5.1.1 Employer Files**

Files in this group are used to store and process payroll data, deferred compensation contributions and insurance premium information submitted by employers and other reporting entities. The files contain member-level wage and contribution detail, as well as payroll dollar amounts due from the employer. Our general observations are as follows:

1. Currently, four alternatives are used to collect payroll data from reporting entities:
  - PERS secure File Transfer Protocol (FTP) – available on the NDPERS Web site
  - Transmittal Reports (paper)
  - An interface file produced from PeopleSoft (for employees of the State, Bank of ND and Higher Education, whose data exists on the mainframe)
  - Diskette files.

Wage and contribution reports submitted via file (FTP, PeopleSoft or diskette) are processed through the legacy wage reporting system. Wage and contribution reports submitted on paper are first sent through data entry at NDPERS, and then processed through the legacy system. When the legacy system encounters a new SSN:

- An error message is printed for that SSN
  - PERS staff calls the employer
  - The new employee is added
  - The employee report for the new member is processed again.
2. Accounts Receivables (employer and individual) are not supported as part of the legacy retirement system; they are handled separately in Excel.

### **3.5.1.2 Retirement System Files (Member and Retirement)**

The files in this group store demographic data, wage and contribution data, and related transactions, and adjusting entries for members (the most recent year in detail and then YTD and LTD summary information).

- Demographic data, especially addresses, at times do not consistently conform to the standards set by the United States Postal Service (the address fields in the current database are not long enough to contain the full 911 address format).





### 3.5.1.3 Tax Files

Our observations here were limited primarily to the process of creating the 1099-R files. In producing the 1099-R forms, information is downloaded from the mainframe Retirement database and the 1099-Rs are printed at NDPERS. The 1099-R file is also sent to the Internal Revenue Service. IRS files used to export data to the IRS raised no issues during our review.

### 3.5.1.4 Account and Actuarial Files

Files in this group are used primarily to export information to the actuary. Member information is formatted on the mainframe via batch job per the actuary's requests, downloaded to the NDPERS Server, and then sent to the actuary for processing. Files used to export data to the actuary raised no issues during our review.

## 3.5.2 Microsoft Access and dBase Databases

A number of Microsoft Access and dBase databases have been developed to supplement functionality in the current LOB application. Ten (10) of them were identified by NDPERS for examination in our database review and are presented in Table 7 below. The function and information life cycle of each database were reviewed. It was determined that, of the ten databases, only four contained data warranting conversion to the new LOB solution. The remaining six databases consist of data that has been downloaded from the mainframe legacy database. NDPERS should consider archiving those databases that do not need to be converted to a read-only database for possible future reference.

**Table 7 - Access and dBase Databases on NDPERS LAN**

Application Name / Function	Programming Language / Tool	Conversion Required
Service Purchase System	dBase (DOS)	Yes
Dental ACH Tracking	dBase (DOS)	Yes
Vision ACH Tracking	dBase (DOS)	Yes
Deferred Comp Provider Reporting	Microsoft Access	No
Defined Contribution Provider Reporting	Microsoft Visual Basic	No
Data Entry for Batch Processing of Retirement contributions, Deferred Comp contributions and Group Insurance payments (IBS)	dBase (DOS)	No
Print Monthly 1099s	ACCESS and Microsoft Visual Basic	No
Job Service Retirement System	Microsoft Excel	Yes
Monthly Zero Beneficiary Reporting	NATURAL/dBase(DOS)	No
Internal Audit Test of Benefits	NATURAL/dBase(DOS)	No

The Access and dBase databases listed above are discussed in the following subsections.

### 3.5.2.1 Service Purchase System

Calculations for the costs to purchase service are performed in an Excel spreadsheet. If a member decides to purchase the service credit, the contract and payments are tracked in this dBase application. After the contract is completed, the service credit is updated on the mainframe retirement system manually.





### ***3.5.2.2 Dental ACH Tracking***

A retiree often pays for dental insurance by automatic bank draft. In these cases, the retiree identification and payment information are tracked (stored) on this dBase database. Changes are updated on this database using the dBase application. At month-end, an extract of the data is sent to the Bank of North Dakota for processing the payments.

### ***3.5.2.3 Vision ACH Tracking***

Similar to the dental plan, a retiree may pay for vision insurance by automatic bank draft. In such cases, the retiree identification and payment information are tracked (stored) on this database. Changes are updated on this database using the dBase application. At month-end, an extract of the data is sent to the Bank of North Dakota for processing the payments.

### ***3.5.2.4 Deferred Compensation Provider Reporting***

Member contributions for Deferred Compensation are downloaded from the mainframe on a daily basis, if contributions were received. This Access application formats these contribution records into separate files for each of the Deferred Compensation providers. The files are then sent to the appropriate providers to update each member's account.

### ***3.5.2.5 Defined Contribution Provider Reporting***

This Visual Basic application has a purpose similar to the Deferred Compensation application described above. Member contributions for the Defined Contribution Plan are downloaded from the mainframe on a daily basis, if contributions were received. The program prints a report used for verification by the Accounting Division. When the contribution totals have been verified, the file is sent to the Defined Contribution provider. Currently, Fidelity is the only provider for the Defined Contribution Plan. (However, providers are selected by competitive bid every six (6) years.) The file is then sent to Fidelity for update of each member account.

### ***3.5.2.6 Data Entry for Batch Processing of Retirement Contributions, Deferred Comp Contributions and Group Insurance Payments Individual Billing System (IBS)***

This dBase application is used for data entry of information sent from employers or individuals on paper reports. The application handles data for Employer Payroll Contribution reports (Retirement Plan contributions), for Deferred Compensation Plan contribution reports, and for payments received from individuals (members or retirees) for payment of group insurance premiums (Individual Billing System). After entry, these transactions are merged with other transactions on the mainframe to update the system.

### ***3.5.2.7 Print 1099Rs***

This Access and Visual Basic application is used to print 1099-R forms for refund and retirement checks issued from the retirement system. The application is run each month for refunds and annually for annuitants and performs the following functions:

- Downloads refund information from the mainframe
- Prints the 1099-Rs.

### ***3.5.2.8 Job Service Retirement System***

This system is a group of over 200 linked Excel spreadsheets that NDPERS inherited from the ND Job Service. The system supports the Job Service Retirement Plan, which is a closed system. Approximately





270 members remain in the system which includes 114 retiree records under the Travelers annuity fund and 45 active and 107 retired members under the closed Job Service system. The system supports member demographic data, contribution reporting, refunds, annual member statements, benefit estimates, and COLA history. Once a member retires, the member is transferred to the mainframe retirement system where the member record is maintained and a retirement benefit is produced.

#### ***3.5.2.9 Monthly Zero Beneficiary Reporting***

This dBase application performs a download from the mainframe of member information on an ad hoc basis. The application produces a list of members of retirement plans or group insurance plans who have not designated a beneficiary. The list of members is sorted by employer. The lists are then sent to the employers.

#### ***3.5.2.10 Internal Audit Test of Benefits***

This dBase application produces a download from the monthly benefit payment system. The download consists of a random sampling of the monthly benefit payments produced by the retirement system. The NDPERS internal auditor then audits the benefit payments for accuracy.

### **3.5.3 Microsoft Excel Spreadsheets**

Some of the functions that NDPERS administers are not handled in the legacy retirement system due to cost constraints of enhancing the mainframe system. To accommodate these responsibilities, NDPERS IT staff has developed several database applications which are housed on the NDPERS Server (see “Microsoft Access and dBase Databases,” above). In addition to these applications, NDPERS staff uses various Excel spreadsheets at their workstations. Often, the staff using them developed the spreadsheets for their own specific purposes. These PC-based work-arounds, in Microsoft Excel and other tools, have added complexity to the processes required to perform the daily functions of NDPERS. Appendix C provides a list of these spreadsheets as identified to LRWL by NDPERS staff.

### **3.5.4 Recommendation**

As a result of this data review, LRWL developed the following recommendations and conclusions in the broad area of addressing the quality of the data stores of the legacy system. Our understanding from IT is that the two recommendations listed below are not new to NDPERS – that both have already been the focus of some level of effort and that both, according to IT, are in one form or another at the point of completion or enforcement. To the extent that demonstrable progress has been made toward them, the recommendations listed below may be viewed as “reaffirming” current priorities or policies. With that acknowledgement, LRWL recommends that NDPERS undertake (continue to pursue) the following initiatives to bring more structure to its current LOB application and peripheral supporting applications (e.g., Access and dBase databases) and better position NDPERS for the conversion of data to the new system:

- Affirm data and software quality as organizational priorities
- Develop and maintain a data dictionary.

The following sections present additional information on each of these recommendations.

#### ***3.5.4.1 Affirm Data and Software Quality as Organizational Priorities***

The NDPERS’ management team needs to affirm data quality as an organizational priority.





Both staff and management appreciate that the replacement LOB solution may not be fully in place for another three to four years – and the implementation period may be further prolonged by the need to clean up data problems that could have been resolved, or even avoided, prior to conversion. And, clearly, day-to-day business processes using the legacy system remain to be completed over that time.

We would recommend that NDPERS continue the effort to verify all data entered and, to the extent possible, ensure that data is consistent among the multiple, non-integrated systems in use at NDPERS.

#### ***3.5.4.2 Develop and Maintain a Data Dictionary***

NDPERS should develop and maintain a comprehensive dictionary of all data elements, structures, flows, stores, processes, and external entities.

Ideally, NDPERS would have the time and resources to develop a comprehensive data dictionary of all the components listed above. However, in light of a new LOB implementation on the horizon, we would limit the scope of this recommendation to the data stores, data structures (files and tables) and data elements of the current LOB solution and the Microsoft Access databases. The nature of the repository for this information is not as important as the comprehensiveness and accuracy of the entries developed. NDPERS should first consult with ITD in an attempt to get comprehensive and usable data on the legacy database housed at ITD.

### **3.5.5 Conclusion**

Our review of the data model provided us – both NDPERS and LRWL staff – with a glimpse of the challenge that lies ahead for NDPERS in organizing, cleansing its legacy data, and converting it to a new environment. Efforts to verify the accuracy of the data in the database, to cleanse the existing legacy data stores, and to prevent future data errors will be both labor-intensive and time-intensive. Much of the analysis and effort will, by necessity, be performed by NDPERS staff members who are already busy conducting NDPERS' business operations and will soon be even busier as they begin to participate in the evaluation, selection, and implementation of a new benefit solution.

Nevertheless, a critical success factor in any LOB benefit solution implementation is to provide the new environment with clean, accurate data. LRWL has witnessed the difficulties encountered by agencies that converted “dirty” data and attempted to cleanse it in the new environment. Failing to cleanse the data prior to its conversion to the new LOB solution has two undesirable consequences:

- First, it leaves the organization unable to distinguish new benefit application errors from data errors, thus needlessly complicating the testing and rollout of the new solution.
- Second, it undermines user acceptance of and confidence in the new system – users cannot be expected to “excuse” poor application performance of the new benefit application even though the real problem is not the application but rather the poor quality of the data converted.

With these two sobering consequences in mind – and appreciating the effort involved, the limited amount of time available to NDPERS staff to support additional work, and the anticipated timeframe when the cleansed data will be required by the new LOB system – we encourage NDPERS to develop the data dictionary and include data cleansing as an option for any future development process. See Section 8.5.3 for a discussion of utilizing the LOB vendor with the responsibility for data cleansing.





## 4 BUSINESS ISSUES AND CHALLENGES

The operating environment currently used presents issues and challenges for NDPERS. The following sections capture those issues and challenges as identified by staff and management during data gathering sessions and through our observation of the current environment.

### 4.1 Organizational Dynamics

This section describes findings related to the strengths and weaknesses of the NDPERS organization. NDPERS staff has exceptional strengths in both their commitment to the organization and service to its members. However, staff appears to be working at maximum capacity. Therefore, the primary weakness of NDPERS is the likelihood that the organization will be unable to maintain the current level of member service in the future, absent a major improvement in its operations – or a major increase in staff. This conclusion is based on known projects that are currently scheduled, potential legislative changes, and the expected growth in the number of North Dakotans retiring in the near future. Other specifics are discussed in the following subsections.

#### 4.1.1 People

NDPERS is in the enviable position of having many competent, knowledgeable, long-term employees. The staff consists of 30 people who fill 29 FTE positions. In total the staff has 313 years of experience at NDPERS or on average almost 11 years each of NDPERS experience. This wealth of experience and NDPERS capabilities has given the agency the opportunity to develop an institutional knowledge level that is extremely high and has also provided the expertise for the agency to meet many of its challenges in the past without having to add significantly to the staffing level or doing extensive modifications to the existing legacy system. However, in the next nine years NDPERS could lose to retirement 48% of its staff representing 60% of this institutional knowledge. In 15 years the agency could lose to retirement 72% of its staff that represents 87% of today's institutional knowledge. This turnover will have significant implications for the agency in terms of its existing business operations. As discussed in the following sections, the extensive use of Excel spreadsheets and manual processes will become even more risky when less experienced staff are integrated into the organization. Secondly, the high level of testing that is associated with modifications to the existing system to insure that unintended changes do not occur will be less effective as less experienced staff assume these duties which will also increase the risk of unintended errors in the processing of benefits.

NDPERS has been attempting to ameliorate this risk recently by updating, producing, and organizing process documentation in all of their business areas (see Section 3.2). The documentation, in its current state, would be difficult for a new employee or someone unfamiliar with particular processes to use. As such, it does not adequately protect NDPERS. At this point, the documentation varies considerably in quality:

- How the documentation is organized
- The level of detail provided
- The inclusion of step by step instructions on how to do each function
- Examples provided of input information and output products for each function.

During this engagement, LRWL reviewed the duties of each NDPERS staff member. The current systems require that data be entered separately into multiple systems. With much of the work being performed manually or in non-integrated spreadsheet or database programs, data and the results of computations must be manually transferred to processes that will use the data. Reducing / eliminating the





manual work and the manual transfer of data from one system to another will reduce the workload on the NDPERS staff, will mitigate the risk inherent to a lack of staff members cross-trained in such activities, and reduce the opportunity for manual errors as the data is re-entered.

#### 4.1.2 Processes

Much of the work of NDPERS is performed outside of the primary mainframe computer system, using Excel spreadsheets, Word documents, or database programs. This practice increases the risk that business rules will be applied inconsistently or data transferred incorrectly (e.g., in order to calculate the cost for a member to purchase service credit, information from the mainframe is entered manually into an Excel spreadsheet which calculates the cost).

Tables 8 and 9 quantifies the number of processes in each program and administration area that are:

1. Fully integrated with mainframe system
2. Not fully integrated with mainframe system

**Table 8 - Program Processes: Fully integrated or not fully integrated**

Function Performed	Fully Integrated	Not Integrated
<b>Defined Benefit Plans (Main, Judges, National Guard, Law Enforcement, Highway Patrol &amp; Job Service) - 6</b>	<b>79</b>	<b>168</b>
Member enrollment	5	1
Member maintenance	5	1
Beneficiary maintenance	5	1
Deaths	5	1
Refunds/Rollovers	5	1
TIAA transfers (Main)		1
MRD		6
QDRO tracking		6
Power of Attorney	5	1
Service credit calculations	5	1
Benefit Estimates	5	1
Counseling - Kits		6
Dual Membership		6
Seminar Preparation		6
Off-site presentations		6
On-site presentations		6
New service retirees		6
New disability retirees		6
Account setup (1 <sup>st</sup> Check)		6
Beneficiary payments – Lump Sum		6
Beneficiary payments -- Monthly	6	
Monthly benefits	6	
Deferred terminations	5	1
Adjustments		6
Tax deductions		6





Function Performed	Fully Integrated	Not Integrated
Deduction changes		6
Vendor payments		6
Tax withholding payments		6
Tax reporting (1099-R)	6	
ACH – Set Up	6	
ACH -- Transmittals		6
Service purchase cost calculations		6
Service purchase agreement tracking		6
Service purchase payment schedules		6
Employer maintenance		6
Authorized agent maintenance	6	
Data verification		6
Correspondence		6
Employer wage & contribution reporting	4	2
Cash receipts journal		6
Accounts receivable/payable tracking		6
NSF checks/voided checks		6
<b>Defined Contribution Plans (Optional Defined Contribution and 457 Deferred Comp) - 2</b>	<b>9</b>	<b>35</b>
Member enrollment	1	1
Member maintenance	2	
Beneficiary maintenance	1	1
Deaths	1	1
Refunds/Rollovers	1	1
QDRO tracking		2
Power of Attorney	1	1
Service credit calculations	1	1
Counseling		2
Seminar Preparation		2
Off-site presentations		2
On-site presentations		2
Employer maintenance		2
Authorized agent maintenance		2
Data verification		2
Correspondence		2
Employer wage & contribution reporting		2
Cash receipts journal		2
Accounts receivable/payable tracking		2
Provider contribution reporting		2
457 Provider training		2
Authorized 457 agents	1	1
<b>Group Insurance (Health, life, dental, vision, LTC) - 5</b>	<b>14</b>	<b>76</b>
Member enrollment	2	3
Member maintenance	2	3
Beneficiary maintenance	2	3





Function Performed	Fully Integrated	Not Integrated
Deaths	2	3
Eligibility		5
COBRA		5
Group Billings		5
Individual Billings	2	3
ACH setup	2	3
Adjustments		5
NSF checks/voided checks		5
Vendor payments		5
Employer maintenance		5
Authorized agent maintenance	2	3
Data verification		5
Correspondence		5
Cash receipts journal		5
Accounts receivable/payable tracking		5
<b>Retiree Health Insurance Credit – 1</b>	<b>1</b>	<b>8</b>
Employer wage & contribution reporting		1
Cash receipts journal		1
Accounts receivable/payable tracking		1
Adjustments		1
New retiree setup		1
Beneficiary setup		1
Individual billings	1	
Vendor payments		1
Correspondence		1
<b>Employee Assistance Program - 1</b>	<b>4</b>	<b>5</b>
Eligibility	1	
Member enrollment	1	
Member maintenance	1	
Employer maintenance		1
Authorized agent maintenance	1	
Vendor payments		1
Correspondence		1
Cash receipts journal		1
Accounts receivable/payable tracking		1
<b>FlexComp - 1</b>	<b>1</b>	<b>9</b>
Member enrollment – New Hire	1	
Open Enrollment		1
Member maintenance		1
Employer maintenance		1
Employer contribution reporting		1
Cash receipts journal		1
Accounts receivable/payable tracking		1





Function Performed	Fully Integrated	Not Integrated
Reimbursement Vouchers		1
Correspondence		1
Data verification		1
<b>Totals</b>	<b>108</b>	<b>301</b>
<b>Percentage of Total Work</b>	<b>26%</b>	<b>74%</b>

**Table 9 - Administration Processes: Fully integrated or not fully integrated**

Function Performed	Fully Integrated	Not Integrated
<b>Accounting</b>	<b>0</b>	<b>2</b>
Interface with G/L	0	1
Bank reconcilements	0	1
<b>Administrative Services</b>	<b>0</b>	<b>3</b>
Correspondence	0	1
Imaging	0	1
Telecommunications	0	1
<b>Development and Research</b>	<b>0</b>	<b>3</b>
Ad hoc reporting	0	1
Death updates	0	1
Insurance testing	0	1
<b>Information Technology</b>	<b>6</b>	<b>13</b>
User access/security	1	
Table updates	1	
Order batch job processing	1	
Setup for batch processing	1	
Ad-hoc reporting/queries		1
Program development	1	
Upload daily batches		1
Deferred Comp Provider Reporting		1
Dental/Vision Exception Reporting		1
DC Reporting		1
BC/BS HIPAA File	1	
1099R Reporting		1
Fidelity Demographics File		1
Zero Beneficiary Reporting		1
FlexComp New Employee Reporting		1





Function Performed	Fully Integrated	Not Integrated
PeopleSoft Queries/Ad-hoc Reporting (for Group Insurance, Job Service, etc.)		1
FlexComp File Creation for Annual Statements		1
Dental & Vision File Creation for Retiree Annual Statements		1
Employer Electronic Reporting		1
<b>Internal Audit</b>	<b>0</b>	<b>6</b>
Ad hoc reporting		1
Open Audits Tracking		1
Audit Project Time Management		1
Test file creation		1
Benefit Testing		1
Sample Selection		1
<b>Totals</b>	<b>6</b>	<b>27</b>
<b>Percentages of Total Work</b>	<b>17%</b>	<b>83%</b>

### 4.1.3 Technologies

The technological foundation on which the primary system and its components are built is in excess of 20 years old. These computer systems have been modified many times to handle changes in NDPERS' business requirements. Changes over the years have exponentially complicated these systems and made it difficult to continue to maintain them efficiently or effectively. Many of the recent program's options could not be automated within the current computer systems for fear of rendering parts of the system inoperable.

A significant backlog exists of requested enhancements. As of this report date, approximately 13 of 111 projects were being worked on by ITD for NDPERS. Allocation of enhancement requests made by NDPERS of ITD along four priority levels results in the following (1 being the most important; 4 being the least important):

- Priority 1: 32 projects (29 due to critical due date and 3 required by legislation)
- Priority 2: 35 projects
- Priority 3: 17 projects
- Priority 4: 27 projects

A combination of factors has caused the backlog to build to this level including budgetary, availability of ITD and NDPERS staff, complexity of required changes, and ITD staffing changes.





Efficiencies and flexibility could be realized by procuring new, more comprehensive, date-effective, business-rules driven, and integrated administrative system. Doing so could also address many of the business problems and challenges presented by this aging technology.

## 4.2 Major Business Issues

Based on our review of the current business environment at NDPERS, there are several areas of concern that we would classify as “Major Business Issues.” The sections that follow provide additional detail on these issues.

### 4.2.1 Absorption of New Programs and Future Growth

NDPERS became an agency in 1966 with one responsibility, the administration of the NDPERS defined contribution plan. Since then the range and complexity of programs administered by the agency has grown. The following demonstrates this growth:

**Table 10 - Growth in Plans Administered**

Year	Number of Programs	Program Name
1977	4	Defined Benefit Plan
		Prior service Plan
		Health Plan
		Life Plan
1983	6	Judges Retirement
		Highway Patrol Retirement
1987	7	Deferred Comp Program
1988	8	Judges 27-17 Retirement
1989	10	Retiree Health Plan
		FlexComp Program
1991	11	National Guard Retirement Plan
1996	13	Dental Plan
		Long Term Care Plan
1997	14	Employee Assistance Plan
1999	16	Optional Defined Contribution Plan
		Portability Enhancement Provision
2003	20	Vision Plan
		Job Service Retirement Plan
		OASIS
		Law Enforcement Plan

Both the number of members served and the number of employers participating has increased with the number of programs administered. Figure 5, below, presents the total number of members served by NDPERS between 1988 and 2007<sup>2</sup>:

<sup>2</sup> Members served in 2007, as estimated.





**Figure 5 Increase in Members Served**

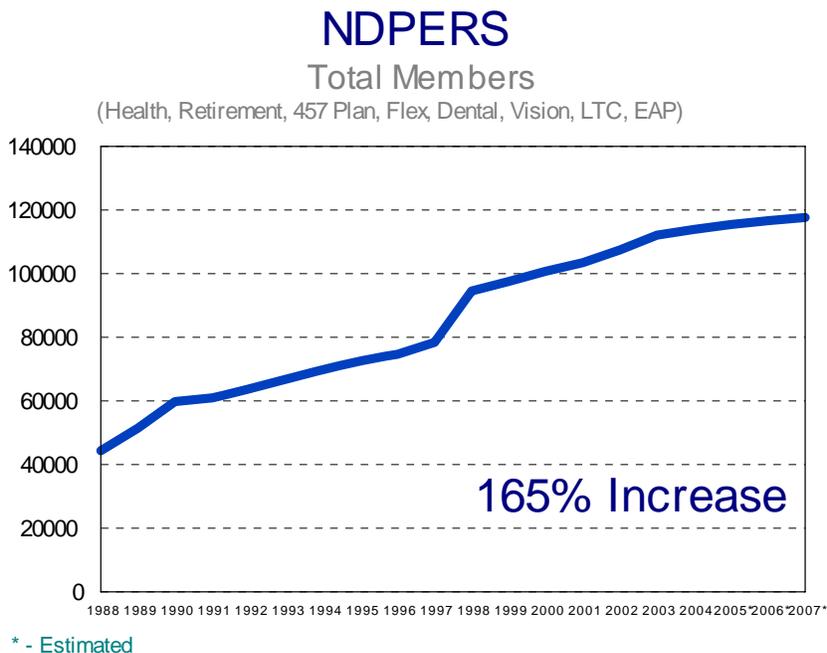
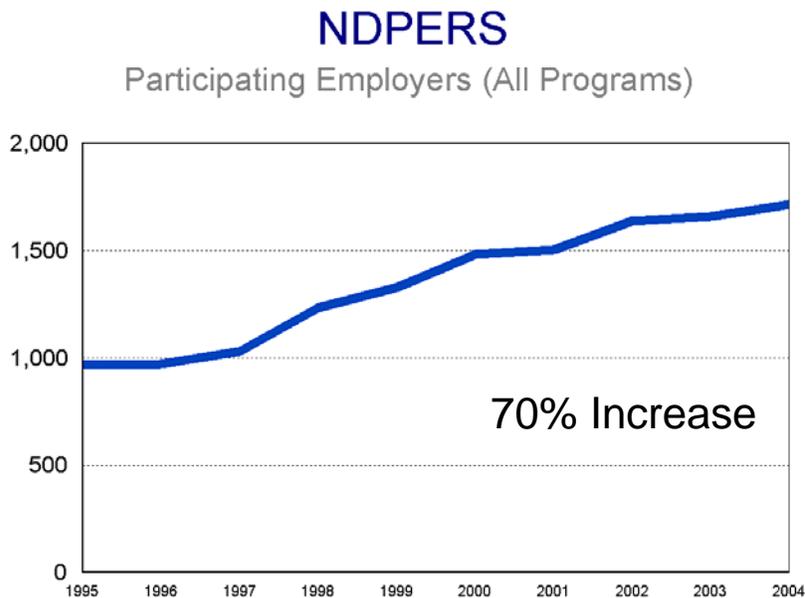


Figure 6, below, presents the total number of employers served by NDPERS between 1995 and 2004:

**Figure 6 - Number of Employers Served**



Consequently it is clear the agency has changed dramatically over the last 40 years. As all of this change has occurred, modifications have been made to the legacy system. Stand-alone PC-based systems and Excel spreadsheets have been added to do some of the functions as well as new manual processes.





While future new programs that may be assigned to NDPERS is unpredictable, it is clear that the demand for NDPERS services will grow even if no new programs are assigned, no new employers join and no additional employees are hired. This growth will come from the growing number of members who will become eligible for retirement. Retirement means that not only will they begin retirement status, but also they will begin participation in the health insurance plan, retiree health credit program and other NDPERS optional plans available at retirement (dental, vision, life, etc). Table 11 provided below presents projected retirements through 2010 using existing rates:

**Table 11 - Projected Retirements**

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Retirements</b>						Projected	Projected	Projected	Projected	Projected
Normal	92	89	114	110	91	117	127	132	155	188
Rule of 85	95	92	145	122	143	168	192	216	236	238
Early	109	100	106	82	116	118	122	133	143	153
Disability	23	24	34	25	24	27	27	26	26	25
<b>Total</b>	<b>319</b>	<b>305</b>	<b>399</b>	<b>339</b>	<b>374</b>	<b>430</b>	<b>468</b>	<b>507</b>	<b>560</b>	<b>604</b>

Based on this analysis, the number of retirements will grow by 61% in the next 5 years. Without a change in its existing methods, PERS projects it would need an increase in staff of 7 FTE, at an estimated cost of \$610,000 per biennium.

#### 4.2.2 Maintainability of Legacy System

In conducting this study we also reviewed the existing system with ITD and ITD pointed out that:

- The longer an application exists, the more difficult enhancements are to make and each one adds complexity that was not built in during the initial analysis. In addition, with as many years as this applications has been maintained, the code becomes difficult to understand and requires more time for developers to code and implement enhancements.
- The application has key programs that need to be changed with most maintenance requests. As a result, they hold up downstream maintenance work because one change has to be completed in order for another to start.
- The current NDPERS applications run on an old technology infrastructure that ITD would like to replace. Most state agencies are submitting cost estimates for Natural application replacement now and ITD envisions seeing most Natural applications in state government being replaced by 2011.
- Natural is a proprietary development language. ITD has not built a new Natural system in the past 8 years.
- The Adabas database is not a relational database. ITD currently designs new applications using relational databases such as Oracle and Microsoft SQL Server. As more state ITD customers migrate away from Adabas, the infrastructure will no longer be shared and could become prohibitively costly for each remaining customer to support.
- The Natural developer pool is getting smaller as those with knowledge of it leave the workplace or transition to more modern languages.





- Most new applications are being developed with Service Oriented Architecture (SOA) with the objective of providing greater agility for an application to be changed in order to meet current and future business needs.

Based upon the information from ITD and our assessment we conclude that maintainability of the current system is problematic and will inevitably become more so for many reasons previously cited – the unavoidable increase in workload that will result from expected retirements, the near obsolescence of technology currently employed, the numerous modifications that have been made to current applications over the years resulting in a fragile piecemeal system, and the dated programming languages and the database management system in use. Furthermore, benefit programs more recently taken on by NDPERS are now typically administered using applications developed by NDPERS IT staff on their local network. While these “stand-alone” applications may address the immediate need, they are not integrated with other functionality and data in the legacy system. While these functions were not added to the legacy application systems because of cost and complexity, these workarounds have added complexity to the processes required to accomplish daily work. As a result, NDPERS faces significant risk of corrupt, contradictory, and inconsistent data and incomplete or incorrect decisions and activities on the part of staff.

### **4.2.3 Manual Processing**

In many cases, work cannot be performed programmatically by the existing Legacy application system and must therefore be completed manually or on the individual staff member’s desktop, and the results manually entered into the system. For the program related processes performed by NDPERS staff, 301 of 409 processes (74%) are not integrated with the mainframe legacy benefit administration system. Of the administration processes performed, 27 of 33 (83%) are not integrated with the mainframe legacy benefit administration system. As a practical matter, no integration exists and opportunities for errors abound.

### **4.2.4 Built-in Limitations**

It is axiomatic: the world was different 20 years ago. This is true nowhere more than in the area of technology. Hard disk space, an expensive commodity in that era, influenced design decisions. For example, numeric fields were defined that are inadequate to store today’s values. Similarly, text fields for addresses, notes, comments, etc. were not set long enough to allow other than abbreviations for actual values in some instances.

Integration among the various tools used to complete the day-to-day work of the system is an issue. Even some recent enhancements to the legacy application system are not integrated. For example, the partial lump sum option for retirement must be computed manually and then entered into the legacy system.

### **4.2.5 Employer Reporting**

As with most systems of its vintage, NDPERS’ legacy system was designed with little if any capability for online, remote access. Data was to be submitted on paper forms, manually entered and then verified or corrected by staff. Of course, the reduced cost of desktop computer power and the advent of the Internet and Web browser have invalidated this archaic data entry paradigm. In modern pension solutions, employer (i.e., member wage, contribution, service credit) information is sourced from and owned by the employers who are responsible for entering, verifying, and correcting their data.

## **4.3 Business and Technology Challenges**

The following subsections describe in detail several challenges that NDPERS currently faces.





### 4.3.1 Implementation of Enhancements

The addition of provisions and options having complex rules that arise due to new legislation are often not automated within the current system. Because of the complexity and fragility of the existing code, NDPERS and ITD have learned that only simple changes are feasible within the current system. Those legislative changes that require involved modifications are at times handled manually or in a quasi-automated, but stand-alone fashion outside of the application system. Both of these non-integrated approaches are undesirable for reasons previously explained. In addition this legacy application system is very large, as well as complex, consisting of 360 computer programs that ITD maintains and over 700 computer programs that NDPERS maintains.

### 4.3.2 Non-Integration of New Plans

A variation of the challenges cited above is that entire new plans, not just functional enhancement, are not integrated within the legacy system. This includes Job Service Retirement, Dental Insurance, Vision Insurance, and the Long-term Care insurance programs. Employer reporting for a variety of plans (e.g., Deferred Compensation), and even the entry of employer reporting data from paper reports in the “main” Retirement System, are maintained on stand-alone systems. Similarly, reconciling and accounts receivable processing for the Group Insurance billing is done manually, outside of the mainframe system. While individual billing is handled on the legacy system, exceptional conditions (such as a check returned for non-sufficient funds) are not handled programmatically.

This fundamental lack of integration presents opportunities for systems that should otherwise be integrated and synchronized to diverge. As a result, there is substantial risk that an incomplete or incorrect decision will be made by NDPERS relative to a member, a retiree or an employer.

### 4.3.3 Resource Intensive System

NDPERS staff is responsible for testing application changes after ITD has done the programming and initial testing. Based on recent past experience, NDPERS staff knows that even simple changes can cause unexpected problems in unanticipated areas of the system. Therefore, NDPERS staff expends an inordinate amount of time in identifying every option and permutation that might be possible in the changed application and generating test data to verify every possibility; and we believe because of this many valid requests by users are not made.

### 4.3.4 Retaining Competent Programmers

NDPERS and ITD have indicated that retaining competent COBOL and Natural/Adabas programmers has become a challenge. The inability or challenge in keeping senior programmers (who, too, are approaching retirement age) and the learning curve and unfamiliarity of new programmers with the complex, interwoven program code creates an opportunity for errors to be systematically introduced or for modifications to existing functionality to regress. Any attempt to procure these programming resources from an outside vendor would increase programming costs by at least 60%. The inability to retain programmers introduces an ongoing risk to NDPERS that possibly may not be mitigated other than through a system replacement.

### 4.3.5 Threatened end to the Support of DOS Programs

Currently, six of the stand-alone PC-based systems utilize dBase programs running under DOS. The systems are running successfully now under the Windows-XP operating system, but Microsoft has stated that it will be discontinuing the support of DOS programs under a future Windows system. Microsoft has





not stated when this change will be made. In addition the number of programmers familiar with and competent in dBase is dwindling.

#### **4.3.6 Retention of Contribution History**

Only the current fiscal year of detail contribution information is kept in the legacy system. Each year, the prior year's detail is added to the Life to Date total, and then deleted from the file. The staff believes the contribution history to be accurate. However, the internal auditor would like to see more detail history for prior years with explanations for any exceptional changes in salary.

#### **4.3.7 Difficulty with Production Operations**

After many years of changes, the application has become fragile; behavior sometimes is unpredictable, as modifications have been made over time. Regardless of the effort expended in testing changes, NDPERS still encounter difficulties while attempting to run production programs. A specific example involves running the monthly retiree benefit payroll to produce the retiree benefit payments. NDPERS discovered that a program aborted, and after NDPERS and ITD researched the problem and made corrections, ITD had to reset the system and restore the files to their original state prior to restarting the job. At times, not everything is reset or restored correctly. When this happens, the program still aborts, and NDPERS and ITD must try again to reset, restore, and restart. It may take several times to complete the entire job correctly. Historically, these interruptions during production processing were minimal. However, recently, they have been occurring with increasing frequency.

#### **4.3.8 Historical Insurance Coverage Not Available**

The legacy system maintains only the current insurance coverage information on the member's record. Staff often must know what coverage the member had during a prior period, when researching prior period adjustments. Keeping an accurate and complete history of insurance coverage, with effective dates and end dates, could be easily accomplished in a new integrated benefit solution.

#### **4.3.9 Employer Reporting for Defined Benefit and Deferred Compensation Plan Input by NDPERS**

Keying or uploading wage and contribution information is a task that should be done by the employer. Approximately 200 political subdivisions report on paper, with NDPERS staff left to enter the data – despite the fact that the employer is the source of the information and in the best position to correct any errors. When the legacy system was developed, offering remote capability to small employers was not economically feasible. With the development of the Internet, this can now be accomplished with reasonable cost and effort.

#### **4.3.10 No Upfront Edit Checks**

Several problems exist in the current method of wage and contribution reporting, e.g.:

- Employers may not report pre-tax versus post-tax contributions correctly, and NDPERS may never know if the report is correct or incorrect in this regard.
- Reported salary often contains non-reportable income and is sometimes missing reportable wages. NDPERS currently has no way to know about or control this issue.
- The current system identifies members whose salary has increased by more than 50% from one month to the next and reports this fact to NDPERS. However, the hard-coded 50% factor should instead be





a parameter that can be adjusted based on organizational preference without the need for a programming change and redeployment of the application. This feature, commonly available in modern pension solutions would improve NDPERS' ability to verify that service credit is being awarded correctly and look for various degrees of salary spiking.

#### **4.3.11 Non-Integrated Systems**

Several functions of the NDPERS systems are not integrated with other parts of the NDPERS system:

- Group Insurance – Group Insurance is integrated with Retiree Health Credit to get the correct premium. However, it is not integrated with the retirement system to establish or maintain deductions.
- Reconciliation of the Group billing for health/life/EAP insurance is an entirely manual process.
- The accounting functions of billing, accounts receivable and accounts payable to employers and members are not integrated with the legacy systems.
- Job Service Retirement Program – is contained on excel spreadsheets and is entirely manual.

#### **4.3.12 Non-Integration with the Accounting System**

NDPERS uses the statewide PeopleSoft accounting system that ITD hosts and maintains. The retirement system applications are not integrated in any way with the PeopleSoft accounting system. This means that the accounting transactions that are generated within each of the retirement systems, as well as the accounting transactions generated within each of the employee benefit plans, must be summarized manually. The summary totals are then input into the PeopleSoft accounting system as manual journal entries.

In addition to the day-to-day accounting transactions generated by the plans, the cash receipts and accounts receivable and payable are handled manually, outside of the systems.

#### **4.3.13 Customer Relationship Management**

Tracking member contacts in Outlook shows that NDPERS is aware of the importance of this function. However, using Outlook for this purpose is cumbersome at best. This also complicates communication with the members regarding any contacts made and actions taken on their account. The Member Services staff must have multiple systems up on the workstation in order to gather all of the information needed to answer member inquiries. A single contact management or CRM-like capability would support this.





## 5 REQUIRED OPERATING ENVIRONMENT

The following sections describe the business environment required by NDPERS management and staff.

### 5.1 Vision

NDPERS has had an agency mission statement, goals, and strategic plans since the early 1990s. Approximately seven years ago, ITD began using a more structured format for strategic planning which involved developing agency drivers. Taken together, these drivers make up NDPERS' vision. NDPERS developed philosophies, goals and objectives associated with each agency driver. The goals and objectives show, at a more detailed level, what NDPERS plans to accomplish through daily tasks in support of the established drivers and philosophies.

NDPERS management presented the drivers, philosophies, goals and objectives to the NDPERS Board of Directors. The Board provided their input and approved them. NDPERS has been basing its strategic plans on this structure since Board approval. Within the strategic plan, projects can be associated with goals and objectives to help ITD ensure that the IT dollars spent by NDPERS actually support the NDPERS vision.

The NDPERS vision consists of the following agency drivers:

- Provide an employee benefit package that is among the best available from public and private employers in the upper Midwest
- Research and evaluate benefit products and services
- Ensure the efficient and accurate administration of member benefits
- Educate members, employers and the public on the value of NDPERS policies and programs
- Earn the respect and trust of our clients
- Attract and retain a competent and highly motivated work force
- Maintain actuarial and financial soundness of the funds.

### 5.2 Capabilities Required

During meetings and interviews with NDPERS management and staff, LRWL noted the following brief descriptions of capabilities required with the existing PERS operating environment. LRWL does not intend this section to be a complete detailed system requirements definition. The information is intended to provide examples of general expectations of a needed operating environment within the agency. Many of the comments made during these discussions related to problems in the existing system.

All NDPERS management and staff stated the operating environment must be updated to reduce the use of manual workarounds and off system worksheets to meet the expanded program responsibilities and members. There may be some exceptions to this rule that NDPERS will agree do not justify automation. Examples could be processes that are performed with very low frequency and/or require only minor manual efforts. Other than these exception conditions, NDPERS would expect a new system to be integrated and comprehensive, handling all aspects of the NDPERS business for all plans administered.

The capabilities required in a new operating environment, as expressed by management and staff, have been organized into ten subsections as provided below.





### 5.2.1 Account Maintenance

An updated operating environment must integrate all plans and programs, utilizing a single account (entry point) for an individual member. When accessing the member's account, NDPERS must have access to information and update capability regarding all plans and programs in which the member participates. Specific comments included:

- A change to a member account would automatically notify the member of the change
- A new application system must handle all plans and programs administered by NDPERS (see list below) in an integrated fashion. That is to say, there must be a single point of entry (an all inclusive database) for all data related to a member, organization or retiree. An update to data (entered once) will be reflected in all plans or programs that utilize that data. The handling of all transactions related to all plans and programs will be automated within the application system, unless the automation cannot be justified due to the infrequency of occurrence.
  - Defined Benefit
    - Main System/Public Employees
    - Judges
    - National Guard
    - Law Enforcement
    - Highway Patrol
    - Job Service Retirement (a closed plan)
  - Defined Contribution
  - Deferred Compensation
  - Health Credit
  - FlexComp interface to PeopleSoft FSA
  - Group Insurance
    - Health
    - Life
    - Long-term Care
    - Vision
    - Dental
  - Employee Assistance Program

### 5.2.2 Account Processing

The processing capabilities must cover all of the plans, programs, functions and requirements of NDPERS. Information must be available for view and update for staff internal to NDPERS. Information must also be available for view and update to members, where appropriate, via Web access. NDPERS staff specifically mentioned the following capabilities:

- For Retirement
  - On-line enrollment
  - Dual membership within plans administered by NDPERS
  - RIO – dual membership (including access to RIO inquiry)
  - Beneficiaries information available on-line
  - Domestic Relation Orders and Power of Attorney
  - Expanded on-line services (more than available currently)
    - Expand Active and Retiree options to view and retrieve “real time” account information





- Add a purchase of service feature to on-line services
- Long-term disability retirement applications, reviews and appeals (including reports and letters, approval, re-certification/re-qualify, and return to work.)
- Comprehensive Benefit Estimate Calculator (including salary increases, dual membership, Level Social Security Option)
- Retiree return to work
- Reduced retirement benefit tracking
- Multiple retirement and retiree health credit contribution levels
- Partial Lump Sum options
- Secure on-line service for missing participant search (MIA's)
- Adjustments for retro-active salary increases or corrections (bonuses, late contributions, missed deposits, erroneous salary) (currently all manual)
- Integrated purchase of service credit
- Military purchases – employer reemployment assurance (USERRA) must be handled
- Ad hoc termination notice letters to members leaving employment (vested and non-vested)
- Reports from provider companies and employer reporting
- Enhanced process to identify and correct member addresses – database fields too small, still has rural route addresses on file, member must sign a change of address.
- Ad hoc reporting (both business system and workflow systems)
- Statements redesigned to be more useful and user friendly (active and retiree)
- Member Service Call Center Technology to include integrated call and logging and reporting
- Call and client tracking must be integrated and available for utilization by all staff (for sharing of information on problem accounts and special conditions)

### 5.2.3 Group Insurance

The processing capabilities must include integrated processing for all of the group insurance plans, functions, and requirements of NDPERS. Information must be available for view and update for staff internal to NDPERS. Information must be available for view and update to members, where appropriate, via Web access. NDPERS staff specifically mentioned the following capabilities:

- Administer insurance benefits for:
  - All employees of the state and higher education
  - All retirees electing continuing coverage for health, life, dental and vision
  - Employees of political subdivisions that choose to be covered by NDPERS
  - All health plans available:
    - Exclusive Provider Organization
    - Preferred Provide Organization
  - Dental
  - Vision
  - Long Term Care
  - Employee Assistance Program
  - Life
- General requirements for group insurance
  - On-line enrollment (EPO and annual enrollment, new hires, new group)
  - Handle all service levels
  - Meet all HIPAA requirements
  - Must handle federally mandated notifications (such as COBRA letters at termination of employment and Medicare related letters upon turning age 65)





- Insurance levels of coverage must be available on-line
- Life insurance (on-line services)
- Produce confirmations of coverage changes
- Maintain coverage history
- Maintain premium history, including adjustment records
- Ability to process automatic premium refund
- Notification for dependents reaching 23 or 26 for health, dental or vision (does not automatically suspend, but produces letters and option to take COBRA)
- On-line access to information; such as
  - Level of coverage
  - Covered individuals
  - Effective date
- Sharing of information for different carriers
- Ad hoc reporting capabilities.

#### **5.2.4 Retiree Payroll**

The required operating environment must handle the monthly retiree payroll. While the process of producing benefit payments must be secure and include appropriate audits, the process must also be automated and efficient. The following specifications were mentioned during meetings with NDPERS staff:

- A user friendly first check setup
- Complete handling of deductions (including taxes, group insurance, other retiree benefits programs, child support payments, IRS liens, union dues)
- Supplemental retiree benefit payments (e.g., ad hoc increases, replacement payments, disability lump sum payouts)
- Automated health credit payments for all retirement options, including lump-sum benefits
- Ad hoc reporting
- Automatic payroll and deduction notices to eliminate quarterly statements
- Automatic calculation of the tax deposit required after checks are produced.

#### **5.2.5 Accounting**

NDPERS utilizes the state's PeopleSoft accounting package, hosted by ITD. The required operating environment must interface with PeopleSoft to provide accurate accounting for all funds, plans and programs administered by NDPERS. Several specific requirements were mentioned during meetings with NDPERS staff and the NDPERS internal auditor:

- Integrate cash receipts, receivables, and payables for all programs and plans
- Produce automated reports for all information that feeds the CAFR
- Automate employer reporting for Deferred Comp and Defined Contribution, as well as Defined Benefit and Group Insurance
  - Defined Contribution is currently reported in the transmittal with Defined Benefit, but NDPERS needs better validation that enrollment and contributions are accurate by plan (plans may have different contribution rates) referring to the correct retirement system
  - Deferred Compensation contribution reporting is handled separately from transmittals; the State and Higher Education submit electronic reports but approximately 100 political subdivisions report on paper
- All plans need to maintain detailed history on employer contributions and transactions





- Group billing and individual billing for Group Insurance must be integrated and automated, including receivables and payables (tracked by individual).

### **5.2.6 Auditing and General Requirements**

During discussions with the NDPERS internal auditor, the following general requirements were noted:

- Controlled and secure access to the system
- Data extraction capability for testing all plans
- Adequate ad hoc reporting capabilities
- Real-time updating (where appropriate), rather than overnight batch processing
- Adequate real-time validation of data and exception reporting (but the system must be flexible enough to handle all types of transactions)
- Adequate logs and system audit trails (logging all changes to the database – user ID, date/time, before images)
- Integration of all programs and plans that NDPERS administers.

### **5.2.7 Administrative**

The following requirements were noted during discussions with the Administrative Services Manager:

- Integrated scheduling for travel and registration/payment for seminars
- Front-end imaging which uses workflow to ‘push’ work (appropriately) through NDPERS’ office
- Include performance metrics to provide assistance in managing workload, allocating and scheduling resources, and identifying backlogs or choke points as they are starting to occur – rather than after they have appeared
- Continue to use the Smart Mailing facility.

### **5.2.8 Program Development and Research**

The Program Development and Research staff expects and needs the following:

- Continued access to:
  - Some monthly files, as needed (e.g., Health, Retirement, Defined Contribution)
  - Quarterly membership updates (currently using three sources to provide death information)
    - A private vendor
    - State Vital Records
    - The Social Security Office
  - Member and retiree dependent information
  - Exclusive Provider Organization (EPO) data (used for testing program requirements)
- Advanced ad hoc reporting capabilities.

### **5.2.9 Change Management and Training**

Several requirements related to training for staff were mentioned, including:

- Training must be adequate for all levels of computer skills
- Change management must be adequate and consider all staff
- NDPERS must consider moving away from using Social Security number (SSN) as a key (currently SSN is used and printed on many reports, letters, notices, checks and other documents).





### 5.2.10 Technical

Technical requirements mentioned included:

- All plans, programs and functions must be integrated
- NDPERS must be trained to perform system maintenance
- System must be table driven (nothing hard-coded in the programs) – rules based, date effective
- We must consider a paperless environment utilizing Electronic Document Management (workflow must be considered as an option)
- A full test environment must be available after implementation
- The system must utilize newer, state of the art technology
- The system must incorporate on-line validation and updating (where appropriate), rather than batch/over-night updates
- Any imaging capabilities must integrate with and use existing licenses for FileNet as made available through ITD
- A browser-based solution would facilitate remote access (e.g., from staff working remote) as well as simplify maintenance of a single set of programs – both those that support NDPERS internally and those that are Web-facing for members and retirees to use
- Equipment (other than the NDPERS LAN servers) must be housed at ITD.





## 6 POSSIBLE APPROACHES

As the previous discussion highlights, NDPERS has grown dramatically over the last 20 years in terms of the programs it administers, the number of employers it serves and the number of members enrolled in its programs. This growth has taken place while the basic NDPERS applications system has remained essentially the same. The resulting consequence of this is that both the complexity and the fragility of the application system have increased with each presenting NDPERS with numerous challenges. The primary means by which the organization has met this challenge has been through the experience of its staff in understanding this complexity and making it work. However, as NDPERS looks to the future, it could lose almost half its staff. In 15 years this increases to 72%. Secondly, agency workload is projected to increase in this same period as more members become eligible for retirement – a 61% increase in the next five years alone. Consequently, NDPERS needs to reduce the complexity of its administrative operations to handle the increase in workload and to prepare for the transition of the agency to new, less-experienced staff.

The following sections discuss the options available to NDPERS in the face of these challenges. The options fall into two categories: first, continue investing in the existing application system or, second, to replace the existing business system.

### 6.1 Maintain the Legacy Application System

In this approach, NDPERS would continue to use its legacy mainframe-based solution supported by ITD. However, it would make a concerted effort with significant investment to include all the currently requested enhancements in the system as well as incorporate all the various work-arounds (automated or manual) within the system.

In the course of gathering data for this report, NDPERS approached ITD for an estimate of the cost of enhancing the legacy application with these changes – the current requested enhancements and the work-arounds. ITD effectively concluded that it was a poor investment of money and time and recommend against this approach.

With the foregoing in mind, we are in agreement with ITD. The option of maintaining and enhancing the current system is not one that NDPERS should even consider.

### 6.2 Replace the Legacy Application System

This section presents a discussion of the two alternatives available to NDPERS for replacing the legacy application system. The three alternatives are:

- Buy the new solution
- Build the new solution

In the following sections, we describe each solution delivery alternative and discuss the advantages and disadvantages of each. Appropriate recommendations are provided.

#### 6.2.1 Buy

Within the “buy” alternative, there are three possible approaches:

- A comprehensive all-inclusive purchase





- A best of breed purchase
- Application service provider (ASP).

### **6.2.1.1 Comprehensive and All-Inclusive (COTS)**

In this delivery model, NDPERS would engage, via a competitive procurement, and charge a single vendor with overall responsibility for delivering the new solution. NDPERS could reasonably view these solutions as commercial, off-the-shelf solutions or COTS. Unless prohibited by the terms of the contract, the selected vendor may elect to subcontract portions of the job (e.g., hardware purchase and installation, training services, etc.), but NDPERS would look to only the single prime contractor as the source of all support and for the resolution of all issues that arise.

Several viable benefit solutions exist in the marketplace and have been successfully implemented at multiple public retirement systems. The benefit application provider implements some of these solutions. Below is a limited list of such providers:

- BearingPoint's BPAS
- Saber's Clarity<sup>3</sup>
- Levi Ray & Shoup's PensionGold®
- Sagitec's NeoSpin™
- Vitech's V3.

Other packages such as PeopleSoft's public pension product or CPAS' product are often implemented by a partner (e.g., Deloitte or Cedar in the case of PeopleSoft and Tier Technologies in the case of CPAS). In either case, the client deals with a single vendor (i.e., the implementation firm) throughout the project, greatly simplifying contract and project management relative to the "best of breed" delivery model discussed below.

Within this delivery model are various implementation models, depending on the benefit application product that is selected:

- **Package/Configurable** – A package solution is one that is delivered "out of the box." Minimal program code customization is performed. Instead, parameters are adjusted (configured) to accommodate the client's particular rules, calculations, etc. The advantage of the package solution is that it is advertised as being relatively economical and quick to implement (when compared to the other three implementation models). The risk of failure is claimed to be reduced, as there is less customization required. In addition, so long as license fees are paid, when a new version of the package is released, the client will receive periodic upgrades. The primary disadvantage of a package solution is that often the retirement system client must adapt its processes to fit those defined by the new package solution. If a retirement system does not have a flexible organizational culture, there is a measurable risk of dissatisfaction or failure. The package implementation model is more popular with smaller public retirement systems whose limited staff size is arguably more open to change and whose funding limitations preclude more costly implementation models. Often third party implementation firms (rather than the package developer) perform the actual installation and implementation. In several cases, this has resulted in limited best practices input because the implementation firms are not specialists in the retirement environment.

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<sup>3</sup> Covansys Corp. completed the sale of its state and local government practice to Saber Consulting Inc. on June 1, 2006.





- **Template / Architecture** – This is a vendor-developed, base solution. For each client, the vendor performs a gap analysis identifying the gaps between the base solution and the retirement system’s specific business requirements. The vendor then modifies the base solution to close the gaps. The base solution continues to evolve, commonly being updated after every new pension system implementation. Template solutions are virtually always implemented by the solution developer using a “proprietary” methodology for tailoring its base solution to the next client. As to advantages, starting with a base template that is modified for each customer site offers lower costs than a custom installation (discussed below) while still permitting the solution to be tailored to meet the client’s unique requirements. The solution becomes the “property,” in some form, of the client, so annual license fees and new version releases may not be applicable – but all vendors who follow this model have been open to providing out-year support services in a variety of forms as defined by the client’s RFP. Most vendors that implement a template-based solution have done it before and have a track record of such implementations. However, each implementation is a “one-of-a-kind” solution. If the vendor updates the base template, previous clients usually have no “rights” to acquire the upgrade. While contracts can be designed to afford the client future upgrade “rights,” all such upgrades will typically require customization services at some additional cost.
- **Framework** – Some vendors have developed applications for individual public pension systems and then reuse parts of them to implement solutions for new clients. For example, they may reuse the conceptual design documents, object models, window or page layouts, and/or database designs. Since these vendors have typically developed several applications prior to reusing the product, they also have developed a reasonably good, repeatable implementation methodology. This model affords the client many of the benefits of a custom package while not incurring the risk inherent in “starting from scratch.” However, the framework implementation model is sometimes more expensive than a template based implementation and may require more time and support from the client.
- **Custom** – In the custom implementation model, the vendor builds the system “from scratch” according to the specifications and desires of the client’s user community – often with input from client IT staff as to architecture and standards to be followed. The obvious advantage is that the solution provides an ideal, completely customized fit to the client’s organization and business practices. The obvious disadvantages are risk and cost. Since custom development requires continuous involvement, review, and approval by the user community, there is a significant risk (as with most first-time software development endeavors) that the project will not meet original cost and schedule targets. The customer owns the solution, so there are no recurring license fees to be paid. However, any application upgrades must be performed using vendor application support personnel or client IT staff extensively trained in the new environment. In general, compared to the other implementation models, a custom solution implies the greatest risk, cost, and project duration. Further, custom solutions (if not provided by a firm well versed in the retirement industry and appropriate best practices) may only provide a technically upgraded solution – without comprehensive incorporation of industry best practices and far reaching process improvements.

At times, the distinction among the implementation models is blurred – sometimes deliberately and sometimes by happenstance. When viewed side by side, all of the implementation models are comparable – with the exception of the custom model. In each (short of the custom approach), the vendor arrives with a baseline product that meets a substantial percentage of the client’s requirements and the balance of the requirements is met through code changes, parameter adjustments, and/or configuration efforts.

Table 12 below presents where we believe the most often encountered vendors rests along a spectrum of solution delivery alternatives:

**Table 12 - Spectrum of Comprehensive Solution Providers**





PACKAGED SOLUTION	CONFIGURABLE SOLUTION	TEMPLATE	FRAMEWORK	CUSTOM DEVELOPMENT
PeopleSoft H/R Oracle Financials (as examples)	LRS Vitech CPAS/Tier	Saber	BearingPoint Sagitec	Tata Infotech OptData (as examples)

### 6.2.1.2 Best of Breed

In the best of breed purchase model, the client conducts multiple procurements in an attempt to acquire the optimum solution in each broad functional area. For example, a retirement system might issue separate RFPs to acquire a membership tracking system, a payroll system, a financial accounting application, a workflow management system, a disability tracking system, a Customer Relationship Management solution, etc. The advantage to this approach is that the client implements in each functional area the solution that best meets its needs (in that area) or can best be customized to do so. The client is under little pressure either to compromise in defining the new solution’s requirements or to change the way it conducts business to conform to each sub-solution’s characteristics.

However, the disadvantages of this approach are numerous:

- **Procurement** – The number of procurements to be supported is problematic. Most retirement system clients are “stretched” just to support single comprehensive solution procurement in addition to completing their day-to-day activities. The best of breed approach demands several procurements and several projects. Phased procurements would be required due to the challenges presented in simultaneously supporting several procurements. Therefore, for several years, client staff would be required to support the implementation of numerous solution components while still supporting members and retirees. This situation would prove untenable in virtually any public retirement system setting.
- **Integration** – The biggest issue perhaps is integration. All of the disparate pieces will need to be integrated into a single, seamless solution. In addition, because of the plethora of choices available in each functional area, the integration problem will be unique, in that the particular combination of solutions has probably never before been fully integrated in a public retirement solution. There are only two choices as to who will perform the integration: the client or another vendor. At the risk of generalizing, there is probably no public retirement system having the necessary skills and available staff hours to accomplish the integration. Seeking a vendor to perform the integration adds yet one more procurement stream to an already over-extended staff. And the bids for integration services will be very high, as system integrators will quickly recognize the project’s enormous risk and therefore price the effort accordingly.
- **Validation** – Validating the integrated solution will be extremely challenging. The number and intricacy of interfaces among components, their bi-directionality, and the volume, complexity, and interrelatedness of the retirement system data imply enormous difficulty in identifying all possible test scenarios and in testing and validating them.
- **Responsibility** – When something goes wrong, identifying which vendor is responsible will be a conundrum. Each vendor will hold one or more other vendors accountable as the source of the problem and therefore the appropriate party to resolve the problem.





While a best of breed approach is appropriate for some businesses (e.g., manufacturers or distributors who require an order entry system, an inventory system, a payroll system, a logistics package, and a financial accounting application – all suitably integrated), it is not well suited to a public retirement system. For clients like NDPERS, a best of breed delivery model implies a much longer project schedule, substantially higher cost, and undue project risk relative to an all-inclusive purchase.

### **6.2.1.3 Application Service Provider (ASP)**

Another alternative that might be considered is an emerging solution approach – use of an application service provider or third party administrator. We are not aware of any multi-employer; statewide, defined benefits plans (similar to NDPERS) that are currently utilizing such solutions. However, we do know that Hewitt Associates, TIAA-CREF and Towers/Perrin-EDS have explored this strategy with a number of NDPERS’ peers. The offering may go by names other than ASP such as “third party administrators,” “co-sourcing,” “in-sourcing,” etc. This approach is reported to have been successful for city, county and private sector DB plans – especially in the automobile-manufacturing sector for Taft-Hartley administrators.

We understand from discussions with potential ASPs that entry into this market is driven by a number of factors, including:

- Sufficient critical mass
- Economies of scale
- Liabilities related to data (and derivative) issues.

This approach could be considered similar to 457 and 401 plan administration – albeit with wage and contribution reporting, service credit tracking, average final wage computation, refunds, refund buy backs, etc. included.

Although there has been some discussion in the marketplace about this approach, LRWL is not aware of any ASPs who are currently providing the service to NDPERS’ true peers. And if there were, NDPERS would have to look closely at the actual services provided, the options available in terms of business processes provided, and the amount of configuration available. NDPERS would be the first to our knowledge. In selecting this approach, NDPERS would need to be comfortable with venturing into relatively uncharted waters.

## **6.2.2 Build**

Cost estimates for the “build” option were arrived at in two ways: first, based on LRWL project archives from several prior system development proposals and, second, from a request submitted to ITD. The magnitude of both estimates is large but each is materially different (i.e., they are both large and costly, but they are not the same). The assumptions used by ITD in arriving at their estimate, and the scope of functionality they envision, may have been different from that that LRWL used for its analysis – which we believe represents the full functionality we would expect to be delivered within a modern benefit administration system.

With that in mind, we present both estimates in the following sections. We also provide commentary on what may contribute to the difference.

### **6.2.2.1 Cost Estimate for Build based on Prior Proposals and LRWL Archives**

NDPERS could elect to build the new benefit solution in-house. This would likely require additional staffing at NDPERS and/or ITD or the use of contract services or a combination of the two.





To evaluate this alternative, the first question to be addressed is the estimated cost of the effort. Estimating the cost to build a benefits solution requires some educated assumptions:

- Based on data in our project archives from several proposals from the solution vendors mentioned above (i.e. those who already have a package, template, a framework, an architecture, or a solution) for similarly sized projects, the number of staff hours to be devoted to configuring and customizing their solutions averages approximately 130,000 hours. However, as we pointed out, that effort was to do the customization and configuration of their existing core product. We would (conservatively) suggest that the creation of the base would require at least an additional 65,000 hours. Therefore, we assume the total number of person-hours for the project to be 195,000 hours. As we explained, this assumption reflects our knowledge of the time devoted by pension solution vendors to building their base solution combined with a reasonable estimate of the effort required to deliver it to an individual client roughly the size of NDPERS.
- The average time available per staff member (whether internal or contractor) to devote to the effort is roughly 1,500 hours per year taking into consideration two weeks of vacation, two weeks of sick leave, ten holidays and 1.5 hours of “down time” each day.
- Let us further assume that the average salary<sup>4</sup> of staff members (whether internal or contractor) assigned to the project is \$75,000 plus an overhead factor of 35% and an operations support cost for supplies, etc. of 5%.

Based on these (conservative) assumptions, the estimated staffing requirement is at least 130 person years at a cost of just under \$14 million. To accomplish the task within a four-year period would require 33 staff positions. This cost estimate is for staff only. It does not include the cost of any additional facilities to house the additional staff nor licenses for operating systems, databases, development tools, or other software that might be required. Nor does it include any funding for additional equipment such as servers to provide for three environments – development, testing and deployment – nor PCs for the development team. It does not include training. If we add a million dollars to cover such items, the rough cost of completing the project in house comes to over \$15 million, conservatively speaking.

We believe this figure is greater than, but on the same order of magnitude of, the cost associated with the procurement of a vendor-supplied solution. However, the following issues also need to be factored into the analysis:

- The addition of a large number of staff members (or contract programmers) to the IT department will require time for recruitment, deployment and training. All of these steps will take time and extend the project’s timeframe. A benefit solution vendor, on the other hand, should come to the project with a built-in and experienced staff – already accustomed to working together and utilizing the vendor’s existing development methodology – which can be productive immediately.
- The addition of a large number of staff members (or contract programmers) will mandate a significant increase in office space that, upon the completion of the project, will no longer be required. A pension solution vendor, on the other hand, would house many of its programming staff at its own development facility, augmented by temporary local office space during the project, thus exerting minimal impact upon the space requirements of the client.

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<sup>4</sup> This assumes an average across a range of skills – journeymen analysts and programmers; specialists in database design and administration, infrastructure architecture, complex tool suites; managers skilled in technology and retirement knowledge, etc.





- In these fiscally challenging times, it would be extremely difficult for a public agency to justify the hiring of so many additional staff members. If temporary/contract staff was to be used instead, another suite of challenges would be introduced, e.g., higher costs, staff continuity challenges, management burdens, responsibility and accountability, and the retention of contract staff during the last phases of the project (even with completion bonuses).
- At the end of the project, ITD would be faced with a decision of staff reductions to return to a normal work force associated with maintenance of the new system or the retention of a core development staff to keep pace with new developments and technologies. On the other hand, a benefit solution vendor “goes away” at the end of the project. Development and maintenance of in-line improvements are usually covered under annual license / maintenance agreements so that the client will not incur these costs (or retain the necessary staff) to stay current with technology changes.
- Development via an in-house approach will likely result in the codification of existing business rules and practices. The selection of an outside product brings with it certain built-in “best practices” and “business process reengineering” opportunities that have been gained over years of development and refinement in support of other public retirement system clients. While there is no guarantee that all such vendor-supplied best practices will be immediately applicable to the next client, their availability certainly offers the potential for introducing new and improved procedures along with more efficient transaction processing.

### **6.2.2.2 Cost Estimate for Build from ITD**

As a result of feedback provided by ITD with respect to the cost of enhancing the legacy applications system, NDPERS submitted a request to ITD for a full legacy application system rewrite resulting in a browser-based application using a relational database.

ITD provided an estimate for replacing the system with current technology including J2EE development, Service Oriented Architecture (SOA), rules-based processing and workflow. The estimate included the existing system functionality, functionality enhancements and additional new functionality.

ITD arrived at an estimate of \$7,565,475. This figure represents \$6,052,380 for the system itself and a 25 percent contingency (\$1,513,095). The contingency rate is based on ITD’s experience with scope changes in projects this size. Refer to Appendix D for an estimation of ITD project costs over a 10-year timeline. ITD indicated that a more accurate estimate would be prepared once the project was started and the analysis phase completed.

ITD would undertake the project using internal and external resources and estimated 40 months to complete the system rewrite.

#### **6.2.2.2.1 ANALYSIS OF ITD ESTIMATE**

In general, the assumptions used by ITD were comparable to those used by LRWL. While the scope of functionality requested included all current functionality, that in the enhancements queue and that included in manual and automated work-arounds, we are generally concerned about “build” projects since development of a system of this size, with the complex business rules and operating characteristics that a benefit administrative system employs, is a significant endeavor. There are numerous opportunities for failure along the way including development of a system that does not employ best practices in development or in the administrative tools that result from that development process. Build solutions also have a greater risk of overruns and failures.

ITD is estimating a 40-month duration for the project. This also presents a risk in the ability for the project team to maintain focus over that duration and for the project team, in general, to remain intact.





Project team members may leave and an incentive would need to be created for them to stay and commit to the project.

In summary, the option for ITD to build a solution in a modern technical environment will not be considered further for the following reasons:

- The costs estimated by ITD to build the solution are comparable to the costs of similar system developed by outside vendors.
- ITD can build a technically good system, but ITD is not in the retirement business, and would not be aware of industry best practices.
- Packages built by the outside vendors have retirement best practices built in.
- Outside vendor staff will have retirement industry expertise.

### 6.3 Recommended Approach

Appendix D provides a comparison of project costs, over a 10-year timeline, to develop a benefit system through ITD or to buy a benefit system from a vendor. The projected cost to develop a system through ITD is \$10,845,151. The projected cost to buy a system from a vendor is 2.6% more, or \$281,689, for a total of \$11,126,840. Developing a system involves greater risk of cost overruns, missed opportunities for business process reengineering (ITD staff do not possess retirement industry expertise) and meeting project deadlines. Buying a system provides less risk, presents the agency with industry best practices and a better opportunity for business process reengineering. Based upon this analysis, we recommend that NDPERS pursue replacement of the legacy application system and not maintain and enhance the current system

. In Appendix D, the costs of option 1 and option 2 consists of several components:

- a) Option 1 - system replacement costs of \$6,100,00 are based on the preliminary estimate from ITD, while Option 2 system replacement costs of \$7,000,000 are based on LRWL experience with comparable system replacement projects.
- b) The procurement option will include the development of an RFP (with a cost of \$316,720) to define the detailed requirements used by the vendors as the basis of their bid.
- c) IV&V/QA/OPM estimated costs for an OPM vendor during the implementation phase (requirements definition, build, test, conversion and implementation) are included in both options 1 and 2; the number for the ITD build option is increased over the procure benefit system replacement option amount because of the additional 4 months in the ITD estimate.
- d) The backfile conversion (loading the images on micro-fiche to FileNet) cost will be \$200,000, no matter which system replacement option is chosen.
- e) ITD chose 25% as their contingency, based on the lack of detailed requirements; while the contingency for the procurement option is 10%, based on LRWL experience with other system replacement projects.
- f) Both options will include \$160,500 per year to backfill the positions of NDPERS staff assigned to the project.





- g) Both options will include costs for ITD to host the hardware and benefit administration system.
- h) Out-year support will be part of either option, to provide on-going support for the benefit administration system.
- i) The column on the far right of the table shows that the total estimated 10-year costs for the ITD build option would be \$10,845,151, while the total estimated 10-year costs for the procurement option would be \$11,126,840. This is a difference of only \$281,689 or 3%.

## 6.4 Critical Success Factors

NDPERS management used its existing agency drivers and philosophies (as described) as a basis for developing Critical Success Factors (CSF) for this feasibility study. CSFs are issues, tasks, or characteristics that must turn out favorably for the system replacement project to be considered a success. The CSFs related directly to the agency's vision and goals. Several CSFs that have been identified relate to a potential IT system replacement project. In this report, the CSFs are categorized as relating to the period of transition to a new system or to the actual required new operating environment.

### 6.4.1 Transition CSFs

The following Critical Success Factors were identified as relating to the current operating environment during the period of transition – when a new system would be studied, justified, designed and implemented:

- Allow no retreat from the current level of operational member services – LRWL must insert a caveat at this time. NDPERS staff is limited and already working at near capacity. We respectfully point out that, like virtually any other public retirement agency undertaking a system replacement, NDPERS should anticipate service levels dropping during the implementation period. This risk can be mitigated, but not completely eliminated, by backfilling positions with staff hired on a temporary basis and managing the process.
- Continue to provide timely reporting of member contribution data
- Continue to provide timely, accurate data to actuaries
- Continue to provide timely, accurate data to external auditors, state auditors and the Office of Management and Budget.

### 6.4.2 Required New Operating Environment CSFs

The Critical Success Factors related to the required new operating environment are divided into three categories: development, implementation and continuing operation of the new LOB system.

- “Development” is defined as the period covering analysis, design and building of the new system.
- “Implementation” covers the period beginning when the new system – in whole or in part – is placed in production.
- “Continuing operation” is defined as the time beginning when the entire system has been put into production.





During “development,” the following must be accomplished in order to call the project a success:

- Deliver feasibility study that thoroughly highlights NDPERS situation and facilitates decision making on whether to proceed with an RFP.
- If a decision to proceed is arrived at, develop and publish a well-crafted RFP with effective evaluation criteria
- Develop understanding of the significance of and difference among: lowest price, best value, and low risk within the context of the needs of our programs
- Ensure commitment and participation of the Legislature, Governor, ITD, NDPERS Board, senior management and other decision makers
- Foster support and commitment to project success among operational staff, management, NDPERS Board, ITD, the legislature, and NDPERS’ employers and members
- Actively pursue a business solution and not a technical masterpiece
- Maintain an environment that supports prompt decision-making, in both the RFP development / vendor selection process and the implementation process
- Use sound project management processes and meet the requirements of North Dakota ITD Enterprise Architecture/Enterprise Project Management Standard STD009-05
- Ensure risks have been identified and adequate risk management techniques utilized
- Ensure the ability to post transactions with an effective date and the ability to audit same
- Ensure the ability to process any transaction at any time of the month through the business application systems (including the 13<sup>th</sup> check)
- Ensure adequate appropriate internal financial controls in the systems
- Provide a system to allow for an automated testing environment
- Ensure thorough testing is performed at appropriate stages
- Provide a system that will automate and integrate all current manual and stand-alone processes
- Ensure that staff has buy-in in the solution and the change process
- Develop a project implementation methodology that recognizes the additional workload and responsibility associated with developing and implementing a new business system and minimizes the associated stress on NDPERS staff
- Allow no retreat from the current level of operational member services (see caveat stated above for “Transition” CSFs).

During “implementation,” the following must be accomplished in order to call the project a success:

- Ensure that the cost of the new business system is equitably allocated to all programs
- Ensure the intended purpose and objectives of the system implementation have been met





- Provide as smooth a transition as possible from old to new with great attention paid to training and change management
- Allow no retreat from the current level of operational member services (see caveat state above for “Transition” CSFs).

During “continuing operation”, the following must be accomplished in order to call the project a success:

- Ensure new business system will not limit the benefits provided by existing programs
- Provide ability to set up and run standard reports in publishable format (html, Excel, PDF)
- Provide ability to extract pertinent management and operational information and metrics
- Provide continued timely reporting of member contribution data
- Ensure that all business transactions are identified and recorded in the General Ledger
- Ensure that all changes to member account balances are recorded in the G/L and to Accounts Receivable
- Provide accurate tax and compliance reporting to members and tax authorities
- Deliver a correct retirement check or EFT the first time it is paid and successively thereafter
- Provide sufficient real-time validation to prevent incorrect data from entering the system
- Apply business rules to consistently enforce standardized processing and eliminate manual and individualized application of rules
- Provide a workflow system to automate work processes, enforce processing consistency, enable automated measurement of work efficiency, backlog, etc., and allow flexibility to change and modify processes when appropriate
- Ensure adequate controls are incorporated to provide efficient and accurate administration of member benefits
- Provide a system that is flexible enough to allow internal IT staff to make minimal modifications when necessary (i.e. legislative changes, rate changes, etc.)
- Provide on demand, complete, user friendly logs and audit reports to track adjustments and changes to data, especially when there are special conditions or when the use of override procedures is available
- Allow no retreat from the current level of operational member services
- Deliver information to members and users through a variety of means including the Web, IVR, PC desktop and printed media
- Continue to achieve high marks from members when asked their opinion of the service they receive from the organization
- Maintain a positive working relationship with our participating employers
- Maintain system security to protect the privacy and confidentiality of personal member information in compliance with federal and state laws





- Continue to provide timely, accurate data to actuaries
- Continue to provide timely, accurate data to external auditors, state auditors and the Office of Management and Budget.

The most effective way of determining whether an organization's Critical Success Factors have been attained is to define and measure against a set of metrics or measurable goals. Improved or shortened work time for daily tasks is only one way to document improvement in services based on the use of the replacement system. NDPERS should also define metrics for those customer service tasks that cannot be accomplished currently. Metrics in these areas can prove increased services are being offered based on use of the replacement system. Please refer to the discussion of operating metrics in Section 3.3.

## **6.5 Concerns Regarding a System Replacement Project**

Many of the concerns mentioned by management and staff related to the availability of time for NDPERS subject matter experts (SMEs) to devote to a project of this magnitude. Management does understand that NDPERS has reached a critical point where the current legacy system will not allow NDPERS to maintain the current level of customer service in the future. Specific concerns mentioned by management and staff include:

- Time required of staff, when staff is already stretched to the apparent maximum level
- Comprehensive and adequate training must be provided for all staff, including IT in the development and implementation process as well as the use of the new system
- Adequate resources must be devoted to change management, to assist in the transition for staff
- NDPERS must have the capability to add screens, reports and simple functionality after the implementation is completed, rather than depending on the vendor for all changes
- The contract must include performance and warranty requirements
- The vendor must provide adequate support both during and after the development and implementation
- NDPERS must have protection against key vendor people leaving the project.





## 7 REPLACEMENT OPTIONS AND AVAILABLE SOLUTIONS

This section explores NDPERS' options for moving forward with its legacy application system replacement project and describes the solutions that are available in the marketplace.

### 7.1 Implementation Alternatives

Implementing a system of the magnitude of the system replacement envisioned by NDPERS requires that we address the implementation strategy carefully with the goal of risk minimization. Below, we present three alternative approaches, each with its pros and cons.

There are three major strategic alternatives for implementing a new LOB benefit solution:

- Phased implementation
- “Big Bang” approach
- Reproduce current environment and expand.

#### 7.1.1 Phased Approach

This is the approach most often selected. Depending on the number of components chosen, the number of phases may range from three to five. Typically, the vendor has significant input in recommending the number of phases, but NDPERS would make the final decision. In addition, since there are offsetting cost effects per the pros and cons below, the actual overall cost impact of embracing a phased approach is probably roughly the same independent of whether 3, 4 or 5 phases are selected.

- Pros – Allows the organization to “eat the elephant one bite at a time”; it also allows for a learning curve for both the vendor and the client. The implementation team can see what they did well in the first phase and make course corrections in the subsequent phases. The operations team gets a chance to learn to use one piece of the solution at a time – as well as suggest to the vendor ways that subsequent phases can be improved. And, possibly most significant, there is less risk that the operations could be “paralyzed” by an un-successful big bang implementation.
- Cons – This approach extends the implementation timeframe by anywhere from thirty to forty percent. Since an extended implementation schedule also directly corresponds to the cost of the project, the longer the time, the greater the cost. The extended duration also means correspondingly more effort required of the project team. Bridging programs (that permit the system to share data between the old and the new solution) must also be developed, tested, and maintained during the “dual cohabitation” period – but are eventually discarded.

#### 7.1.2 “Big Bang” Approach

Vendors may suggest that new system functionality be brought up all at once via a single phase cutover (e.g., in a “big bang”). This approach has significant shortcomings. It puts a considerably increased burden on the user acceptance testing, conversion testing and understanding of reconciliation procedures. Possibly the most significant risk introduced by this method is the introduction of functionality new to NDPERS personnel – including workflow processes, member and employer service processes, benefit estimate routines, etc. – all at the same time. The potential risk of failure at that point is significant. For that reason, the agency might feel compelled to run the legacy and new systems in parallel for a period of time (e.g., 3 to 6 months). Unfortunately, doing so introduces a significant additional administrative burden on the agency, one that, under these circumstances, would already be taxing a thin staff.





- Pros – It is unnecessary to develop programs that must bridge data between the new application and the legacy application. The new system can be implemented in a (marginally) shorter time frame. Although the “shock” and impact of a new system implementation via a big bang approach may be more intense, it is over sooner.
- Cons – Stress of the cutover is felt across the organization not simply in one business area. It requires an extremely focused management team to maintain the project vision throughout the organization and keep users from getting discouraged. Running the legacy and new system in parallel, to mitigate the impact of a failure on cutover, would likely be required and doing so would require frequent and regular reconciliation between the two systems. No “learning curves” are available to “fine tune” later phase rollouts. Note that vendors are able to deliver solutions more rapidly than clients can accept, absorb, and integrate them.

### **7.1.3 Reproduce Current Environment and Expand**

This implementation method might be characterized as “Do a technology transfer first; then provide best practices and enhancements later.” It provides some of the advantages of the big bang approach discussed above, but because most of the potential improvements are implemented in later releases, this approach requires extraordinary commitment to the project’s vision from the client – both management and staff – for a long time before significant improvement is experienced.

- Pros – The initial cost is lower since, while the solution architecture must support future enhancement of features, those features are not a part of the initial phase. However, the new platform is positioned for future enhancements and functionality/technology enablers. All current system data is converted or integrated as part of the initial rollout so no bridging of that data is necessary. The initial phase of the solution can be implemented in a shorter time frame.
- Cons – Best practice changes to the current environment are limited in the initial solution rollout. The strategy requires a strong management team to maintain the vision and keep users from getting discouraged. There is a danger that the initial foundation architecture is incomplete or does not foresee capabilities required in subsequent releases – a problem detected only later (perhaps much later) when the subsequent phase is designed or implemented. Most important, this approach has not been previously widely completed and evaluated.





## 8 TECHNOLOGIES AND SUPPORT COMPONENTS FOR ALL PLANS AND PROGRAMS

Below we discuss the various technologies that comprise a comprehensive integrated benefit solution, as well as the support components that are required for the successful implementation of the project.

### 8.1 Line-of-Business (LOB) Benefit Administration Application

This may be viewed as the core component of the replacement effort. The line-of-business functions include the applications that permit a retirement agency to perform its operations, e.g., wage and contribution reporting, generating benefit estimates, calculating the cost of purchased service, retirement processing, issuing payroll, 1099 processing, etc. All of the agency's core "processes" should be contained in the line-of-business application. Whether they are available "out of the box" depends on which vendor is selected, which vendor product is chosen and what delivery model is used (see related discussion in Section 6.2). In NDPERS' case, additional functionality for the Group Insurance Plans (life, health, dental, vision and long term care), Deferred Compensation, Defined Contribution and an interface to FlexComp would also be required.

Most of the major benefit administration solution providers offer comprehensive LOB capability, which typically includes at least some of the following business functionality:

<ul style="list-style-type: none"> <li>■ Membership Eligibility</li> <li>■ Contributions</li> <li>■ Reciprocity</li> <li>■ General Ledger</li> <li>■ Purchasing and Reinstating Service</li> <li>■ Membership Status</li> <li>■ Statement of Account</li> <li>■ Benefit Estimate</li> <li>■ Disability Retirement</li> <li>■ Withdrawal of Contributions</li> <li>■ Administering the impact of divorce on a member's account</li> <li>■ Appeal Processing</li> <li>■ Income Tax Processing</li> </ul>	<ul style="list-style-type: none"> <li>■ Payment of Benefits</li> <li>■ Employer Health Insurance Coverage</li> <li>■ Service Retirement</li> <li>■ Death Before Retirement</li> <li>■ Durable Power of Attorney</li> <li>■ Cost-of-Living Adjustments</li> <li>■ Customer Service / Activity Tracking</li> <li>■ Plan Information</li> <li>■ Working After Retirement</li> <li>■ Audit / Security</li> <li>■ Imaging / Workflow</li> <li>■ General Reporting / Query</li> <li>■ Call Center</li> <li>■ Member Education</li> </ul>
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A preliminary decision involving LOB functionality relates to the solution's delivery model. As discussed in Section 6, there are various delivery models available from the major vendors (e.g., package, template, configurable architecture, and even custom development), which imply varying degrees of configuration and customization of the base solution to the customer's specific requirements. LRWL's recommendation is that either a package- or template-model is most applicable to NDPERS.

An additional factor revolves around the degree of integration between the LOB application and the imaging and workflow management components. When implemented correctly, tight integration may promote work efficiency and system security and control. However, when it is implemented without benefit of a thoughtful and detailed requirements analysis, it can actually impede work. In addition, any implementation must be strongly influenced by knowledge and application of industry best practices.





Finally NDPERS relatively small size suggests not tightly coupling the workflow, but rather allowing some flexibility.

Our recommendation is to pursue a level of integration that will allow NDPERS to put most work processes under workflow management control but retain the ability to process work outside of the workflow management system on an exception-only basis. Doing so will ensure, for example, that steps are not “skipped,” data integrity is preserved, transactions are not completed until all necessary forms are received, etc.). NDPERS must also ensure that the development of each workflow process is developed with awareness of best practices.

## 8.2 Customer Relationship Management (CRM)

The Customer Relationship Management (CRM) capability incorporated into the best LOB solutions includes maintaining information on all contacts with members, retirees, and employers. The degree of robustness and functionality may vary greatly:

- From minimal capabilities that track interaction in a formalized “notes” capability,
- Through logging all interfaces in a semi-automated manner,
- To a totally integrated and fully functional CRM or call center capability.

CRM functionality allows the retirement system to record, track, and analyze all contact a member, retiree or beneficiary (or even an employer) has with the retirement system. Thus at a high level all dealings with an individual “customer” can be viewed centrally assuring a member-centric approach to problems and issues. This is useful, for example, when a member is “shopping” for answers, when informing a member that a certain form was received, when telling a member when an application was processed, and when answering questions related to information previously supplied by phone or correspondence previously sent by mail or email.

CRM may be viewed as a superset solution encompassing:

- Contact management, in which all contact with a member, retiree, beneficiary, or employer is recorded with the mode of contact, who performed it, when it occurred, and the subject discussed in a structured mode including free form notes describing the interaction.
- Call center capability, by which all incoming telephone calls from members, retirees, beneficiaries, or employers are directed to the correct dedicated call center staff for service. In the best CRM solutions, Automated (AVR) or Integrated (IVR) Voice Response functionality is provided so that callers are guided through a series of menu choices to access the service or information they are seeking. Many AVR and IVR solutions facilitate member self-service by phone for the most common requests (e.g., “Has my retirement application form been received?” or “What will be the date of my first retirement check?”). This is similar to the service provided by many banks or credit card processors when a customer calls to request current account balance information. Inquiries that cannot be satisfied in this automated fashion are routed to the proper staff via caller responses via telephone keypad to a series of questions.
- Computer Telephony Interface (CTI), wherein a customer service-oriented screen, viewed by the NDPERS staff member, is primed based on a caller-ID provided telephone number or entering a unique identifier via a telephone keypad and connectivity to the LOB software. Through such an interface, the caller’s demographic and other relevant information is presented and available to the staff member when they answer the call.





## 8.3 Web Enablement

The following sections review Web enablement or Web-based access in the implementation of a new benefits solution for each of three “constituencies:”

- Members (and retirees)
- Employers
- NDPERS staff.

### 8.3.1 Retirement System Member

An important benefit (and challenge) to providing member services via the Web is that the service window available to the member expands (for those activities available over the Web) from eight hours a day, five days a week to a near 24 hours a day, 365 days a year. Potential capabilities of a member-accessible Web-based interface with NDPERS are summarized below:

- A benefit estimator which provides an accurate estimate of the member’s retirement benefit using live member data rather than requiring the member to input his or her work history and assumptions. In addition, such an estimator could facilitate an exploration of retirement options (e.g., “How much would my benefit increase with the purchase of three years of service?”). This is available in NDPERS’ current implementation of a Web-based estimator.
- Access to electronic versions of all the paper forms currently in use within the system similar to NDPERS current capability but auto-populated with appropriate member data (e.g., name, SSN, DOB, current address) and bar-coded to assist in recognition when the member-completed form is returned to NDPERS.
- Web-based member data collection which, when submitted through the Web browser, initiates a workflow and is captured in the document archive as if it had been initiated on a bar-coded paper form. Such a capability would present a populated form that the user could print but would simultaneously be saved in the NDPERS member document archive as a record of the transaction.
- Web-based member, retiree and employer communications would permit NDPERS to reduce paper-based communications with their members. If a member elects to receive correspondence and communication via email, the Web-enabled solution would notify the member of such a document and direct the member to a Web location to view on-line, download and/or print the document. Alternatively, since member service, wage, and contribution data will be available on a close to 24/7, any member with Web access could produce a statement at any time.

We believe there are three major risks to be managed in the implementation of a Web-based interface such as the one described above:

- **Correctness of member data** – In a recent survey of public retirement systems and their plans for the use of the Web to provide greatly enhanced member self-service, the remark that most impressed us was one that warned of providing members access to inaccurate data. Before opening the data up to member review, NDPERS must ensure its completeness and accuracy, possibly by involving the members in an interactive review of their data.
- **Updating data** – Currently NDPERS member contributions and interest is posted on a monthly cycle. All of the potential replacement systems allow for contributions to be posted when received and do not require queuing data for monthly posting. If elected, frequent posting of contributions – or of other transactions, such as refunds – will add an increased workload on the NDPERS staff responsible for reviewing and reconciling the data.





- **Design of Web site to take best advantage of technology** – The tools and practices available to create the best, most interactive and productive Web experience for members change and improve daily it would seem. While usage of the site may initially be low, we believe members will quickly make it their preferred means of interacting with NDPERS if the site is well implemented and updated regularly, the value members and employers place on the Web site will be a product of the creativity of the Web designers and their understanding of what potentially draws members and employers to the site.

While Web enablement offers the greatest promise of all technology enablers for providing a high degree of customer self-service, there are a number of important caveats to be kept in mind when considering its implementation.

- First, security is a critical concern. All member data, if not confidential, is certainly personal. It must be safeguarded from view by unauthorized persons. NDPERS will have to issue members their own user PIN (personal identification number) and password. PIN management and appropriate security controls have to be designed to prevent unauthorized access. Furthermore, PIN management can prove to be a resource intensive – but necessary – endeavor. We suggest that before NDPERS opens up its data to member access, the entire security issue be thoroughly addressed.
- Second, Web-based service must be strictly limited to those functions that are truly subject to automation – i.e., functions that do not require human intervention or decision making to complete. Although the overall recommendation of this report is to implement a highly automated, fully integrated solution, most such public retirement solutions nevertheless retain human decision-making responsibility in a number of processes. An example might be determining the amount of service credit available for purchase by a member. Often, the retirement system counselor must first ask a series of questions of the member and/or request documentation. Then the counselor subjectively applies “business rules” that may or may not completely and consistently reflect all rules or rules as others interpret them within the organization. Any such process that is known to vary or suspected of varying from one case to another should be reviewed critically before being considered for publication or posting to the Web site. It is imperative that any interactive functionality providing a derived value provide the same answer that would be supplied to any other member or retiree having the same information in the database, and the same answer they would have received from retirement system staff.
- Third, both technological tools and staff resources must be allocated to supporting the Web capability – at least in the short-term. Once members are able to see their own data, and are compelled by NDPERS to visit the Web site and review their data, the agency should expect to receive numerous phone calls seeking assistance and questioning the data. While the long-term benefit of Web-enabled customer self-service is a reduction in member inquiries of staff, the short-term effect will likely be an increase in the number of calls received. Members will need to have a response to their calls or they will not view the Web site as a viable and reliable alternative and will migrate back to the path of least resistance – calling NDPERS with inquiries.

With these in mind, Web-based services should be rolled out in phases, limiting the scope of any single phase to that which can be adequately supported by retirement system staff. For example, Web-based service could be rolled out function-by-function – e.g., first forms submittal, then demographic updates, then data-driven calculators, etc. NDPERS may want to consider reviewing a history of member services call counts and time release of new Web functionality to correspond with anticipated lulls in call volume.





### 8.3.2 Employer

NDPERS' current employer reporting capability consists of employers submitting wage and contribution reports via FTP. The reports are then read into a PC-based validation program. If no validation errors are found, the file is moved up to the mainframe for processing. If file format errors are found, the employer is contacted and told of the errors with a request that they be corrected and a new file submitted. There currently is no Web-based interaction with the employer with respect to submitting or entering and correcting wage and contribution data. Similarly, no capability currently exists which allows employers to enroll new members over the web or for members to change beneficiary data.

NDPERS has expressed a keen interest in Web-based employer reporting. Such a capability should (and can), at a minimum, allow an employer to:

- Submit wage and contribution data or insurance premium or other plan contribution data by file or by keyboard entry into the Web site pages
- Run the data through a validation process and identify data errors
- Correct errors in submitted data online or reject the data and resubmit entirely new replacement data for the filing period
- Finalize the reported data and either post the data online/real-time or submit it to some controlled posting process initiated and monitored by an NDPERS staff member
- Update current member demographic data based on the data submitted and posted through this process
- Take advantage of workflow processes that are “spun off” as a result of posting employer data (e.g., new member enrollment form for member submitted through the payroll stream for the first time)
- Produce an “invoice” or receivable amount derived directly from the submitted data and the rates currently in place for the plan or program.

For those plans and programs that involve an additional third party (e.g., defined contribution process and Fidelity or health insurance and a specific health insurance carrier), consideration will need to be given to the nature of data collected and what level of integration needs to exist between the employer reporting system and the other third party administrative (TPA) systems. For example, should defined contribution plan contributions automatically be transmitted to the TPA once posted to the system or should some manual intervention be required prior to transmitting to the TPA?

### 8.3.3 NDPERS Staff Member

Implementation of workflow capabilities in a new replacement system has the potential to diminish the need for all staff to be in one location. Implementing a browser-based solution would bring the benefits of essentially allowing staff and management to regularly work from home or other remote locations, including field sites while providing counseling sessions. Management should consider the organizational benefits and challenges posed by this new approach. Web enablement of daily business functions offers advantages, including:

- Providing a work environment more attractive to and supportive of part-time and stay-at-home workers
- Taking the first step (by providing alternative or distributed work locations) in supporting disaster recovery capability.





The challenge associated with staff member Web-based access to the system lies not in the method of implementation nor with whether the system is bought or built. The challenge stems from a necessary review of personnel policies and possible change in management attitudes toward where work is done. In assessing this challenge, management should not overlook the reporting capabilities of workflow tools. In addition, NDPERS should ensure that explicit requirements are included within the RFP for extracting operating metrics of interest to management to monitor employee processes and throughput – whether staff performs their work at NDPERS’ offices, at home or elsewhere.

### **8.3.4 Data**

The quality of data converted from the legacy system to the replacement system will significantly impact how well staff; management, members, employers, and other stakeholders adopt and embrace the replacement system. Data cleansing and data conversion will require thorough planning and a significant investment of resources.

### **8.3.5 Data Cleansing**

The cleanliness or integrity of the data maintained by retirement systems can vary. The data we have encountered in some of our engagements has been cleaner than in others. In some cases, only certain of the data may present problems (e.g., service purchase history). We found during our interviews with NDPERS staff that known data issues involve data such as demographic information, address and marital status (data that is entered in multiple places). This type of data can be out of sync or incomplete. Marital status may be correct in the Group Insurance System, but it may be missing or inaccurate in the Retirement System, making tax calculations incorrect.

NDPERS program staff believes that historical salary and service credit is accurate. Members seldom question benefit calculations performed based on this data. However, NDPERS’ IT staff has a concern that all data may be less than complete, less than perfectly accurate, or less than totally consistent. This may be for a number of reasons, including:

- The sheer volumes of data maintained
- The source of the data – those submitting the data may not be motivated to provide data completely and accurately
- The number of disparate databases maintained
- The differing modes and media for submitting data, and
- The number of system conversions that may have occurred during the system’s lifetime.

A data-cleansing project entails a vendor taking the data and cleansing it by applying defined sets of logical rules. Some cleansing can be done programmatically, and other cleansing activities will require research, (possibly) correspondence with employers, and/or manual correction.

With the implementation of the new retirement solution, future “contamination” of the data resource will be avoided. Modern relational database technology and intelligent application design and implementation will ensure a single, unambiguous source for each data value. A well-designed data model and comprehensive data validation within the front-end application and through stored procedures and triggers in the database will guarantee the quality of data entering the system going forward. The LOB vendor will assist NDPERS in defining all the edits required to ensure the continued integrity of the database after rollout.

However, any errors that already exist in the database must be corrected.





In Section 3.5, LRWL recommended that NDPERS begin work promptly on developing a data dictionary and, further, on verifying the accuracy and integrity of data maintained within the various systems it administers. In the event NDPERS decides the effort is larger than it can handle with existing resources, we would encourage it to consider including responsibility for a data cleansing effort within the scope of activities included in the system replacement RFP. Under such an arrangement, the vendor should be requested to include within their proposal a data quality assessment to determine overall data quality and what specific data elements require remediation, and develop and execute a plan to cleanse the data in preparation for converting it to the new system. The selected vendor should be made responsible for developing a systematic approach to:

- Identify all existing types of errors
- Isolate those accounts, records or data elements containing one or more instances of each error type
- Design automated tools for correcting all errors that lend themselves to an automated solution
- Design alternative procedures for correcting all remaining errors that are not suited to an automated correction process.

Intensive involvement of retirement system staff in this effort cannot be avoided. Subject Matter Experts and IT staff must be available to the LOB vendor to assist in the analysis. The SMEs also need to be available to determine the processes and criteria by which the cleansing effort will be verified. By necessity, some data cleansing activities will involve manual efforts. To the extent possible, such manual efforts should be manned by outside resources – possibly the LOB vendor, a third party vendor, or temporary hires. But all data cleansing initiatives must be controlled by and placed within the overall responsibilities of the LOB vendor. Obviously, wherever possible, automated procedures should be used.

Finally, it must be acknowledged that, no matter how conscientiously NDPERS staff and LOB vendor consultants address these data cleansing activities, some data errors will go undetected. Such errors will be identified only when a user first discovers them when reviewing the account, for example, to generate a retirement benefit estimate either in testing or in production. The new solution must provide an account audit function by which a user can flag (with a date and time stamp) the account as audited and corrected. From that point forward, the record is assumed to be correct unless challenged by the member.

The data-related issues and requirements discussed above should be included in the system replacement RFP; again, if NDPERS concludes the effort is one larger than it can take on with existing resources. Furthermore, if such is the case, the RFP should establish data cleansing as a deliverable to be completed (if possible) prior to the first functional rollout of the new benefit application.

The data remediation process should include providing a detailed audit history report of all data changes and adjustments made – including before and after states of the data, how the data was changed and why, what erroneous condition was corrected, and how the change was effected. We also suggest that an internal auditor determine how such changes should be documented to assure an adequate audit trail of all data cleansing activities.

### **8.3.6 Data Conversion and Bridging**

A critical component of the implementation project is the accurate and complete conversion of legacy system data to the new solution environment. LRWL recommends that the LOB vendor be assigned primary responsibility for data conversion. The major vendors have experience in the conversion process and possess the tools required to expedite the process. The LOB vendor should be required to create a data conversion plan that establishes the conversion environment and outlines strategies for the automated





and (if necessary) manual conversion of data to the new solution. The LOB vendor's data conversion plan should:

- Identify how the conversion requirements will be confirmed and refined
- Describe how the data elements in the legacy system will be analyzed
- Prepare a data conversion specification
- Identify the approach for manual data conversion, including the design of data collection forms and creation procedures for unreliable legacy system data
- Develop data conversion test scripts
- Create the schedule for conversion activities
- Ensure the compatibility and coordination of the data conversion effort with the overall system implementation plan.

The LOB vendor should also be required to conduct multiple tests of the conversion process including providing detailed reconciliation and balancing procedures for ensuring that all legacy system data was correctly converted and loaded. The conversion process must protect the integrity and confidentiality of the data.

As stated earlier, we recommend that a new solution be implemented in distinct phases. However, the benefits of a phased implementation require either or both of forward and backward data bridging (i.e., the regular, periodic “synchronizing” of data between the old and new environments when both environments are in use). We recommend that the LOB vendor be charged with responsibility for planning an appropriately phased conversion of data with phased bridging of data between the two environments until the final cutover to the new solution is achieved. A detailed, written conversion and bridging plan should be required of and prepared by the LOB vendor for each functional phase cutover. The significance of the bridging requirement may warrant NDPERS requiring prior experience in data conversion and data bridging in a phased implementation as a pre-condition for bidding on the implementation.

In addition, we recommend that the LOB vendor be assigned responsibility for the development of written procedures, methods, and checklists for balancing and reconciling the conversion and bridging of data between the legacy environment and the new environment. These procedures should include providing a detailed written audit history of all data changes and adjustments made – including “before” and “after” states of the data, how and why the data was changed, and how the correction was made.

### **8.3.7 Hardware**

In our experience, every public benefit modernization project entails the addition or replacement of hardware. The advent of browser-based solutions usually makes unnecessary a wholesale replacement of the client PC workstations. Any PC adequate to provide internet-browsing capabilities can support a browser-based benefit application. However, inevitably numerous additional servers and supporting equipment are required – not only to run the application and house its database, but also to provide fail-over and disaster recovery protection. If a browser-based solution is not required of the vendor or if NDPERS prefers a client/server, thick-client solution, replacement of PC workstations may be an issue. At a minimum, an inventory of the workstations and printers and their capabilities would need to be provided in the RFP. Material related to NDPERS current hardware has been gathered and is presented in Section 3.4.2.2, Hardware and System Software.





Regardless of whether the system is a browser-based solution or thick client solution, a decision is required as to who will provide the necessary hardware components. Typically, there are two choices:

- Having the solution provider include all the hardware specifications and configuration information in its proposal along with a quote to supply that required hardware (albeit typically through a third party subcontractor that is transparent to the client).
- Having the solution provider include all the hardware specifications and configuration information in its proposal along with a quote on that required hardware, but reserving to the client the option to procure it directly or require the vendor to do so.

Our recommendation is to require the LOB vendor to provide the hardware. NDPERS may also instruct the vendor to provide detailed specifications of all required hardware, so that ITD may cost the hardware from their procurement sources, as well as ensure that the hardware meets ND ITD standards. Issues that enter into the discussion and decision making process in this regard include:

- Problems that can be avoided by “one stop shopping”
- Problems that can be avoided if the delivery of the ordered items is late (finger pointing)
- Problems that can be avoided if there are problems with the items delivered (incorrect, malfunctions, etc.)
- Issues related to the vendor possibly wanting to stage the hardware at its site prior to final delivery to NDPERS.

Most public retirement systems seek a “bundled” solution from the LOB vendor that includes, in addition to the benefit application, the required hardware – all delivered, uncrated, installed, loaded, tested, configured, etc. by the vendor. Retirement systems that choose to acquire the additional hardware under separate procurements frequently experience problems in assessing accountability and culpability when something goes wrong. When a scheduled milestone cannot be met, the implementation vendor tends to blame the client, offering excuses like “the servers were not configured in time to load the application.” The “one-stop shopping” approach we recommend eliminates all such finger pointing.

Nevertheless, some clients are strongly encouraged, even required, by their procurement policies to pursue separate procurements for hardware. In these situations, the client’s goal is always one of economics and it is well served by separate procurement vehicles in some cases. However, when the project is as large, as time-consuming, as complex, as integrated, and as highly customized as a new benefit administration system implementation, this quest for economy is generally counterproductive. Unless NDPERS is absolutely required to procure hardware separately, this approach should be avoided. Even aside from the primary accountability issue, we recommend against trying to support yet another resource intensive and time-critical procurement. It would only add to the significant stress that will be placed on agency staff.

### **8.3.8 Commodity Software**

All new benefit solutions incorporate several commodity software products, including items such as operating systems, relational database management systems, query and report writers, development tools, office suite applications, etc. As in the case for hardware, a decision has to be made as to who supplies the commodity software products. All of the same issues apply to this situation as were discussed under hardware in the preceding section. Our recommendation relating to commodity software purchase is analogous. Unless precluded from doing so by policy or statute, NDPERS should bundle the purchase of commodity software with the benefit application procurement, making the LOB vendor responsible for





acquiring, installing, and appropriately configuring the software to support the overall solution. The vendor should provide detailed specifications on commodity software to NDPERS, so that ND ITD could provide costs for comparison and ensure that state standards are met.

### **8.3.9 Reports and Queries**

A number of components related to reports and queries are included in vendor-supplied benefit solutions:

- First, the RFP will define the requirement that all current report and query functionality must be provided – albeit perhaps in a different number of and differently formatted queries and reports. This requirement is defined in a number of ways in the RFP – primarily by listing existing reports and queries in the RFP itself and providing samples of them in the Appendices.
- Second, the vendor is required to provide not just an ad hoc query and reporting tool, but also priming its use by providing required tool definitions (i.e., schema definitions, mappings, etc.) and samples of various representative types of reports and queries that NDPERS staff (both IT staff and designated “super-users”) can use as models and templates. In this same vein, comprehensive training – and IT setup and maintenance of the tools and their use – should be required for an appropriate number of NDPERS staff.
- Third, delivery of such ad hoc reporting and query tools should be required early in the project so they may be used by not only vendor staff, but also by NDPERS staff (both IT and “super-users”) to assist in data conversion and data cleansing analysis, balancing, and reconciliation.

The use of increased automation within an LOB solution permits far greater detail in the variety of reports that the system produces. Furthermore, because of the integrated nature of the solution, the reporting has the potential to be far more thorough, providing access to areas (and the interrelationships among those areas) that previously went unmeasured and unreported.

Of particular interest in most new benefit solutions are automated reporting capabilities relating to work status, work throughput measurement and user processing efficiency which one would expect to obtain from the typical workflow implementation. Work-item status reports enhance customer service in that member queries for status can be answered by the person on the phone – or even by the member themselves via a Web-based query. Work processing reports help management identify business-processing areas offering the potential for process improvement (though not necessarily just how best to make those improvements). Measurement of staff productivity, which was previously unavailable, will now, be made available via throughput metric reports (see 3.3 Operating Metrics).

Increased Web-access to the system, whether for member self-service or remote staff member access (from home or on the road during remote counseling), provides the potential for increased Web-based intrusion or misuse. Security audit alerts and reports become increasingly important in this environment. In addition, such reports enable ready exploration of fraudulent activities, postings, etc.

The use of a centralized data repository opens a new universe of “what-if” inquiries and reports that were not previously readily available or within the domain of the end user. Such reports will increase NDPERS’ ability to respond quickly and accurately to requests from legislators and Board Members.

### **8.3.10 Data Warehouse**

A number of public retirement system clients consider a Data Warehouse as an alternative to a separate ad hoc reporting and query environment.





In the latter case, a truly separate environment is established for ad hoc query and reporting; the environment is defined as a separate database instance (i.e., a copy) from the production instance so that queries and reports will have no negative impact on production activities. Ideally, the database used for ad hoc query and reporting is on a server separate from the production server. However, depending on the client site's philosophy and budget, the ad hoc reporting and query environment may not be separate from the development and test or the quality assurance environments. In some cases, it may be the 'hot' backup site – or even the test environment.

Several of our clients have considered the implementation of a separate Data Warehouse. As is to be expected, approaches to the Data Warehouse vary – ranging from a so-called Executive Information Solution to a Data Cube. Some of these solutions are already crafted; others are developed on a case-by-case basis. In concept, the production instance of the database is post-processed on a periodic basis and a so-called data warehouse or data cube is constructed. Its purpose is to support both (historically) known and prospectively expected ad hoc reports and queries. The same training and preparation (for set-up and use) as described in the previous section must be provided.

### 8.3.11 Warranty

The RFP should require LOB vendors to provide a warranty on the delivered solution, ensuring that it will operate, in its entirety, in accordance with specifications approved by NDPERS, for a fixed period of time after final turnover and acceptance of the last phase of the project. In a phased implementation, such a warranty should apply to each set of program deliverables commencing with the point they are accepted on through to the end of the warranty for the last phase (i.e., the effective warranty for the first phase would be markedly longer than that for the last phase). Like any other warranty, the longer the warranty period, the greater it would cost. Generally, LOB vendors are required to warranty their solutions for a minimum of six to twelve months.

During the warranty period, should a problem develop in the solution, the vendor must provide support as necessary to correct it. Frequently, a "trouble report protocol" is established in advance. This protocol categorizes the severity of the problems and mandates the type and level of response required depending on severity: the more severe the problem, the faster the required response. For example, a critical problem that prevents the issuance of benefit payroll EFTs (or checks) may require two-hour telephone response, with an escalation to mandatory on-site support if the problem is not corrected within four hours.

LRWL recommends that the RFP for the LOB benefit solution specify warranty requirements in detail. We further recommend that, in addition to the LOB application, two other areas of warranty support be required:

- Federal regulatory changes (most commonly, tax rate and bracket adjustments) should be provided by the LOB vendor under the warranty (i.e., at no additional charge)
- A special warranty for certain functionality that may not be executed within the warranty period should be provided. For example, if the final cutover occurs in April and the warranty period is six months, then member annual statements and 1099s will not be generated on the production system within the warranty period. The LOB RFP should require that the warranty period for such (typically annual) jobs will not begin until the first time the process is run live in the production environment.

We point out that if warranty parameters are left undefined as a requirement, vendors will provide their "standard" warranty and warranty response times – which may not be appropriate or acceptable to NDPERS.





### 8.3.12 Post-Warranty Support

In the previous section we discussed the warranty requirements that NDPERS might include in the RFP for a LOB solution. Once the warranty period is over, NDPERS can choose one of several approaches to long-term support. The only requirement is that there has to be agreement on what is defined in the RFP and responded to in the proposals. Below we present several models that have been used successfully by other LRWL clients:

- **Fully Outsourced Support** – Beyond the implementation warranty period, outsourcing the support of the new benefit system after it has been rolled out is not uncommon. Systems developed in the modern environments normally use more numerous and varied components than development required for the older legacy systems. Therefore, maintenance and support require knowledge of and experience with more software components and system tools. Many retirement system IT departments do not have the experience or skill sets necessary to immediately begin supporting the new infrastructure along with the new application upon final rollout and acceptance. Thus, the implementation vendor often continues to provide infrastructure and applications support in the post-warranty period.
- **Decreasing, Partial Outsourcing** – A variation on the full outsourcing approach is to gradually phase in client support at the same time vendor support is gradually phased out. This phased transition can typically be accomplished over a period of two to four years. It serves to reduce the risk to the client in the short-term and provides a clear path for the organization to support itself in the long-term.
- **Full In-House Support** – This approach is feasible only if NDPERS has played a major role in the design and development of the LOB solution. Should that be the case, NDPERS IT staff will be sufficiently knowledgeable that they will not need to transition into the role of providing post-warranty support.

Earlier in this document, LRWL recommended that NDPERS select an approach in which an outside vendor be selected as the entity primarily responsible for design and implementation of the new LOB solution. Given the limited IT resources available to NDPERS, we view Full Outsourced Support by the system vendor as the most practical Post Warranty Support alternative. However, with that being said, we recommend that the RFP require each vendor, regardless of the option required by NDPERS, to provide an estimate of both hours (broken down by skill level) and cost of the post-warranty operations and IT support, if for no other reason than such an estimate provides a data point against which to plan NDPERS' support options.

Finally, we point out that should NDPERS choose the in-house post-warranty support model (either starting immediately or transitioning to it over time), the RFP should require the vendor to include and cost a proposed transition plan that will include the training of NDPERS personnel on any special tools or procedures. The transition plan would also cover the handover of all appropriate and/or necessary design tools, development tools, test and documentation tools as well as scripts, documentation, and any other technologies or knowledge that would be required by any reasonable support agent.

### 8.3.13 Data Center, Facilities and DRP

ITD is currently or soon will be hosting the legacy business application system on a series of Linux servers. It is anticipated that ITD will continue to provide hosting services for the new benefit applications. We assume that NDPERS and ITD will want to retain hosting control over the new solution. Nonetheless, a number of questions remain to be addressed:





- A separate “hot site” is not presently required to provide necessary information processing services in the event of a disaster at NDPERS’ primary site. A “ghost server” situation is available through ITD in the event of a disaster rendering the primary site inaccessible. ITD itself has a “hot site” to ensure that it can provide critical services to its clients. It is not known whether the environment will have the flexibility and capacity of any new equipment brought into the mix by the implementation vendor. In general, LRWL recommends a hot site capability exist due to the critical need to run pension payroll—every month, on time, without fail.
- NDPERS is required to keep a current Continuum of Government (COG) plan on web-based software provided by the Risk Management Division (Strohl Systems). This software contains a directory of critical tasks and addresses staff notification, alternate sites, ITD contacts, Team assignments and information processing needs when a business interruption occurs. In conjunction with the ghost server previously listed, the COG plan facilitates retrieval of system backups and critical information processing needs until the disaster can be resolved and normal operations can resume. Under the umbrella of the current effort, LRWL would recommend that NDPERS choose to utilize the COG plan as a starting point to implement a Disaster Recovery Plan, with hot site capability.
- If the decision is made to proceed with an RFP, the successful vendor must be able to document restoration of the system in a manner that is compatible with the State’s COG software and also provide recommended business continuity documentation.

### 8.3.14 Staff Augmentation

The success of the project will depend to a significant degree on NDPERS’ enduring commitment to provide the Subject Matter Expert (SME) support necessary to help define and design the new solution in detail, to review and evaluate project deliverables, to participate in acceptance testing activities, etc. Making this necessary commitment will be painful because the right people to commit to the project are the very people on whom day-to-day retirement system processing most relies. Further, these very critical human resources must be available to the project from its inception and remain dedicated to it for a period of years. Thus the most critical requirement in preparing for a successful implementation is to take the necessary steps to **augment NDPERS staff** to replace those current staff members who will be dedicated to supporting project activities and decision-making.

In this regard, there are three decision areas to be addressed:

- First, from what organizational units will SMEs have to be drawn to provide all of the necessary disciplines *and* the subject matter knowledge required by the project?
- Second, how many resources from each area will be required and who specifically will be recruited to support the project as SMEs, thus leaving a “vacancy?”
- Third, how will new resources be identified to backfill those who leave vacancies?

LRWL recommends that the RFP for the LOB benefit solution be drafted to require the vendors to specify the level of NDPERS participation (in person hours) that will be required to support the implementation and the disciplines from which these resources should be drawn. In general, however, it can already be anticipated that SMEs will be required from most, if not all, of the following functional areas:

- Employer Services
- Member Services
- Financial Services





- Information Technology
- General Counsel (as needed)
- Internal Auditor (as needed)
- Executive Management (as needed).

Some, if not all, of these functional areas will also have to participate in the pre-implementation phases of the project (i.e., needs analysis, RFP preparation, review and evaluation of vendor proposals, etc.). Project demands during this discovery process will be part-time, and some members of the team will not be wholly removed from their normal duties.

Once the new benefit system implementation begins, however, project demands on the many of the designated representatives from the organizational areas identified above may approach a full-time effort. Balancing project responsibilities and day-to-day responsibilities will be a challenge. In addition, as has been stressed previously in this report, the strongest and most knowledgeable NDPERS staff members should be assigned to the project team – in a familiar model that entails “short-term pain for long-term gain.”

Therefore, at the project’s very beginning, decisions need to be made regarding how to backfill the positions that are going to be vacated so that the SMEs are available as soon as they are needed. We recommend that part-time and/or temporary employees be recruited to fill the vacancies. If this model of temporary staff additions is not feasible due to policy, then procurement will have to be undertaken to solicit contractor backfill support.

A word of caution is in order: Both significant effort and time will be required. Replacements or supplemental resources will have to be identified, recruited, hired, oriented, and trained in their job duties before the project team candidates are removed from their current positions. All of these activities must be incorporated into the original project plan to ensure that all necessary organizational elements are in place to support benefit processing at the time the project team members transition to project duties. And the amount of time needed to have these new staff members come up to speed must not be overlooked: identify needs, procure/obtain individuals, educate them, and have them become knowledgeable.

### **8.3.15 Mandatory Options**

Though it may appear as a contradiction in terms, the use of “mandatory options” within the RFP has proven to be a value-add to our clients’ system replacement RFPs. The term refers to the practice of including in the RFP a specific set of business functionality, services or goods that must be priced by the vendor and included in their proposal. The client, NDPERS, would then have the option at the time the contract is signed or subsequently (as stipulated in the RFP) to select the option or not. By including mandatory options within the RFP, NDPERS gains commitment to provide a variety of goods and services within a single procurement structure. It also provides a means for NDPERS to gather cost and technical information for procurement components it might envision in the future but elect to conduct separate from the replacement procurement. The benefits to NDPERS are numerous and significant. The downside is limited to the additional time invested, during RFP development, for gathering specifics requirements or general descriptions associated with each option.

The range of mandatory options included in the RFP depends on NDPERS’ preferences. However, a number of the technologies and components listed above in earlier sections often are viewed as candidates. These include:

- Hardware
- Commodity Software





- Post-warranty Support (maintenance and out-year support from vendor)
- Post-warranty Support (maintenance and out-year support migrated to client resources)
- Staff augmentation
- Data Center Facilities
- Disaster Recovery Planning and Facilities

An illustrative list of other mandatory options occasionally seen would include:

- Bulk Printing and Outsourcing of Printing
- Defined Contribution Processing
- Deferred Retirement Option Plan (DROP) Processing
- Telephone System Replacement

### **Microfiche Conversion**

We believe that completing the back-file fiche conversion is an excellent candidate for a mandatory option in NDPERS' case. The scope of the activity is well bounded and limited and can be relatively, easily managed. Determining a cost by the vendor should be straight forward, whether the vendor itself performs the service or sub-contracts the effort. Converting the fiche for inclusion in the image archive would make processing workflows more efficient as all available images for a member would be readily at hand. According to NDPERS there are approximately 640,000 pages of member data on microfiche. Based on our past experience in procurements that involved image back-file conversion, we estimate conversion of these images would cost between \$150,000 and \$200,000.





## 9 PROJECT CONSIDERATIONS

Several different types of resources contribute to a project's success. In this section, we describe those resources in further detail.

### 9.1 Facilities

Building project *esprit de corps*, ensuring enhanced communications (both among NDPERS personnel and between NDPERS and the eventual solution vendor), providing a home-within-a-home for the people involved on the project – these are all reasons for providing a dedicated, sufficiently equipped work space large enough to accommodate all NDPERS' project team members partially or fully dedicated to the project, as well as necessary solution vendor personnel.

Demands for meeting room and office space will vary over the course of the project (e.g., sizable for requirements definition, joint design sessions, user acceptance testing and training). It is possible that no adequate contiguous space is available in NDPERS' current office location. If this is the case, then additional office facilities may need to be identified and leased – as close as possible in proximity to NDPERS' offices. Though a separate location implies some level of inconvenience (though removing people from their normal work environment can also have its benefits), the overriding objective is to ensure that all project-assigned NDPERS staff are convenient to the remainder of the NDPERS staff as necessary.

Wherever the facility is located, it needs to be furnished with adequate desk space, phones, PCs, printers, copying equipment, FAX machines, conference rooms, whiteboards, testing and training facilities, etc.

LOB benefit solution vendors will set forth in their proposals the specific office space and data center requirements for their particular solutions. However, it may be necessary for NDPERS to begin addressing these issues now.

### 9.2 Personnel

Committing an adequate number of the right staff members to the project is one of the most – and possibly the most – significant contributor to project success. This commitment must include:

- **A close to full-time project manager** – This needs to be a non-IT person, someone who projects “command presence” and is well respected throughout the organization. This key person must possess good verbal and written communications skills, as well as strong organizational, management, and administrative skills. The project manager must be someone who is “listened to” at all levels of NDPERS – i.e., able to inspire retirement counselors *and* to enlist sponsorship and support from the executive office. Ideally the project manager will be from NDPERS' ranks; alternately NDPERS could seek a contract project manager – one who knows the retirement business and offers strong project management skills.
- **A Steering Committee** – This group will provide strategic direction and senior management control to the project. It should consist of management level staff members representing all of NDPERS' organization – including an engaged Executive Director. The Steering Committee will meet at least once a month for the project's duration. It will provide decision-making support relating to major project issues. The Steering Committee will also actively “sponsor” the project, staunchly defending difficult decisions that perhaps cause short-term problems in the interests of a favorable long-term result. A key role is to remove impediments to the project's success as they arise (and they will arise). It is expected that, in an organization the size of NDPERS, there would be material overlap between the Steering Committee and the Project Management Team (see below). However, the





objectives and perspectives of the two are materially different – Steering Committee functions with a higher view whereas the Project Management Team gets into the day-to-day tasks and challenges of the project.

- **A project management team** – This is the leadership team that will provide tactical direction and support to the project. It should include the following areas of expertise:
  - ✓ Planning
  - ✓ Technical architecture and technology
  - ✓ Retirement system business knowledge
  - ✓ Oversight project management (to assist the dedicated Project Manager)
  - ✓ Quality assurance
  - ✓ Independent Validation and Verification (IVV)
  - ✓ Administrative.

The project management team will also eventually include the benefit solution provider’s dedicated project manager and perhaps one or more managers from any third party vendor(s) enlisted to support the project with expertise and previous experience with oversight project management, quality assurance and/or independent validation and verification in public retirement systems. In addition, NDPERS would likely enlist the assistance and guidance of a representative from ITD. Typically, the project management team will meet “formally” on a weekly basis to address overall project issues.

- **Subject Matter Experts (SMEs)** – NDPERS must be willing to dedicate between two to four users, managers or supervisors who, for periods of time during the project, may work close to full time on project tasks beginning with contract award. In addition, at times during the project, NDPERS should expect that another four to eight staff members will be involved anywhere from 50% - 75% of the time (to participate in detailed requirements definition, test planning and execution activities, training sessions, etc.). The number of hours required from the SMEs, and when in the project schedule they will be required, will be identified by the solution vendors in their proposals.

### 9.3 Planning and Management

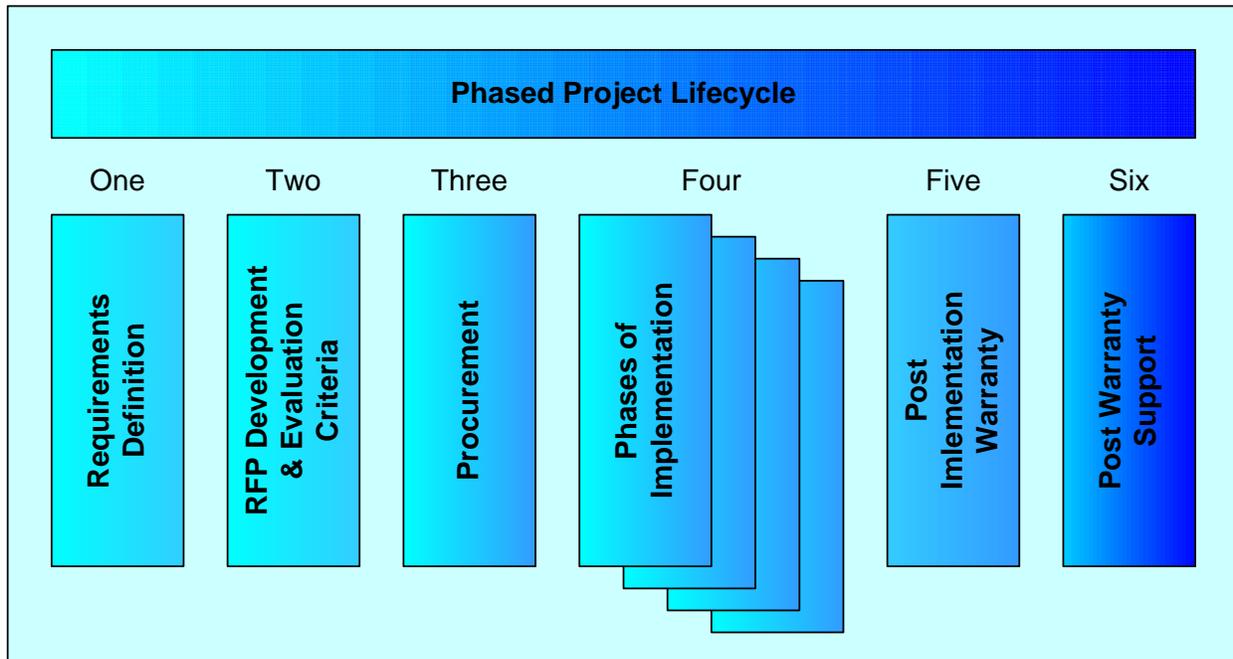
The first step in the project is the development of a comprehensive, integrated plan against which project activities can be executed and progress can be gauged. We believe a phased approach to solution implementation is best. Given such a phased approach, NDPERS can anticipate numerous phases including those phases leading up to the contract signing (i.e., those for RFP and procurement activities [Phases 1-3 in Figure 7 below]). As a backdrop for considering these proposals, we offer the following components based upon our experience in a number of similar projects (Figure 7).

We anticipate that the overall project will encompass six major phases. These phases are not to be confused with the benefit application functional rollout phases – e.g., membership accounting, benefit payment, employer reporting. The phases, which encompass all activities from the original definition of requirements through post warranty support, are summarized in Figure 7.





**FIGURE 7 - THE PHASED PROJECT LIFE CYCLE**



The first phase (Requirements Definition) began when NDPERS awarded LRWL the contract to develop this report (see Section 5.2 Capabilities Required in New System for high level requirements).

The second phase (RFP Development and Evaluation Criteria) will begin assuming Board approval for the project is forthcoming at the June meeting. When the second phase is completed, NDPERS will issue an RFP soliciting proposals from the vendor community and have in place the evaluation criteria necessary to review, rank and determine a preferred vendor.

Phase three (Procurement) will involve NDPERS staff in a number of steps leading to the execution of the contract. Procurement activity will include the following:

- Advertising the RFP itself in accordance with NDPERS procurement procedures and regulations.
- Conducting a bidders' conference to provide additional information, solicit questions and reply to those questions.
- Receiving the actual responses from the competing vendors.
- Conducting the first round of evaluations and preparation of any necessary questions or requests for clarifications.
- Conducting the second round of evaluations to examine the supplemental materials submitted by the vendors.
- Conducting the product demonstrations by selected vendors.
- Soliciting "Best and Final Offers" from selected vendors.
- Identifying the preferred vendor
- Conducting contract negotiations





- Awarding the contract to the successful vendor.

Phase four (Implementation) is the longest part of the project and can last for two or more years. Typically, this phase includes the following steps:

- Reviewing, confirming or reaffirming requirements as stated in the RFP.
- General design activities including a number of Joint Applications Design (JAD) sessions targeted at hammering out the specifics of the NDPERS business rules as they apply to the selected software application. It is not atypical to include some business process reengineering during this phase as well.
- Establishing the necessary infrastructure and environment to host and house the application development effort, the testing effort and the final work environment.
- Implementing the core line-of-business functionality – including user acceptance testing, training, data conversion and acceptance – for the following sets of functionality:
  - ✓ Member processing, employer contributions, wage posting, etc.
  - ✓ Benefit calculation including purchase of service, refunds and other sub processes.
  - ✓ Payroll and other disbursements
  - ✓ Web enablement.

Throughout this phase the vendor will be engaged in data conversion efforts, testing, training and rollout activities associated with each of the above sub steps. If NDPERS elects to have the vendor undertake the data cleansing effort, it often will occur at the beginning of phase four as well.

Phase Five (Warranty) will occur after the solution rollout and should be tied to the final release of the entire system. During this period any defects that have been identified by the users following roll out will be addressed and remedied by the vendor.

The final phase (Post Warranty Support) will depend upon the model selected by NDPERS as part of the development of the RFP.

## 9.4 Timeframe

The project's duration will depend to some extent on the solution selected. Our experience suggests that eight to ten months is required to develop the RFP, evaluate vendor proposals, and negotiate a contract for an effort of this magnitude. Based on our experience, most comprehensive phased public retirement system implementations of this size and complexity take from 30 to 36 months to go from contract execution to "go-live" of the final phase. The combination of the RFP development, procurement and the system implementation can be expected to take from three to four years, depending on the number of functional rollouts. None of the above timeframes include the warranty period.

Figure 8 below depicts the RFP development and procurement and implementation activities under a phased approach.





**Figure: 8 - Timeline for RFP Development, Procurement and Phased Implementation**

ID	Task Name	2006				2007				2008				2009				2010				2011			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
1	Phase 0 - Startup																								
12	Phase 1: Feasibility Study and Cost Benefit Analysis																								
52	Phase 3: RFP Development																								
53	RFP Development																								
54	Publish RFP																								
55	Vendors develop and submit proposals																								
56	Evaluate proposals and select vendor																								
57	Implementation																								
58	Infrastructure, Requirements, Design																								
59	Phase 1 Implementation																								
60	Phase 2 Implementation																								
61	Phase 3 Implementation																								
62	Warranty (6 months)																								
63	Post Implementation Support																								
64																									
65	Phase 4: Option - Project Management																								

## 9.5 Oversight Project Management, Quality Assurance, and/or Independent Verification and Validation Resource

It goes without saying that managing the implementation of a new benefit solution – especially a solution as highly integrated and all-encompassing as the one being recommended herein – is a major challenge. The selected solution vendor will almost surely assign a full-time project manager. NDPERS will assign a close to full-time project manager. In addition to these indispensable resources, it is recommended that NDPERS also acquire the services of an outside oversight project manager to add to the PMO capabilities. Again, the objective is to enlist the support of a firm that is experienced in several previous public retirement system solution implementations.

The skills to be sought in the oversight project manager include:

- Organizational / staff assessment skills relating to retirement system LOB implementations – to gauge the effectiveness of the project organization and the individual team members (both NDPERS and vendor) and to make recommendations to improve the project organization if so indicated
- Scope management skills – to review change requests from several viewpoints (necessity of the requests, whether or not they are actually outside the project’s original scope, reasonableness of estimated cost, feasibility in terms of the project schedule, tracking of change requests over the course of the project, etc.)
- Deliverable evaluation skills – reviewing vendor submitted deliverables against RFP requirements and project specifications, assessing adequacy of test plans and examining test results, reporting deliverable deficiencies back to NDPERS and the implementation vendor, authorizing payments associated with submitted deliverables, etc.
- Issues resolution – identifying project issues, analyzing underlying causes, developing alternatives for resolution, achieving consensus on recommended course of action, follow-up, issues tracking, etc.

NDPERS identified this as an option in their recent RFP; it needs to be executed prior to the start of the implementation phase.





## 10 REVIEW OF COSTS

The following sections present information pertinent to NDPERS' decision to move forward with the benefit system replacement RFP. The first section presents historic data drawn from our familiarity with a number of implementations, either underway or completed, with solution characteristics comparable to those that NDPERS envisions. The second section presents a list of software vendors active in the public benefit systems space.

### 10.1 Cost Considerations

Tables 13 and 14 below provide information invaluable to determining comparable costs to the NDPERS system replacement.

Table 13 - Public Benefit System Demographic Data, provides statistics for member, agency employee, employer, etc. for similar retirement systems. Each entry in "Public Benefit System Demographic Data" provides the following information:

- Retirement System
- Portfolio Value (\$Billion)
- Active Members (000's)
- Retirees (000's)
- Total (000's)
- Number of Employers
- Multiple Plans
- Multiple Locations
- Number of Agency Employees

Table 14, - Public Benefit System Implementation Comparables, presents the overall solution implementation cost, hardware costs, imaging cost, and other noteworthy characteristics of the implementation. Each of the characteristics gathered is described briefly below:

- Retirement System – Indicates the retirement system being described
- Date of Contract – Indicates year when the implementation started
- Solution Implementation – Provides the overall cost of the solution, including hardware, software, customizations, installation, and configuration
- H/W – Presents separately the cost of any hardware procured to run the software, including upgrades to servers, network switches, etc.
- Total LOB Implementation – Presents total cost of the LOB implementation
- Back-file Conversion – Indicates the cost for any imaging back-file conversion effort and whether imaging was a capability elected by the client site
- Total Imaging Costs – Provides the total cost of any imaging related hardware, software (e.g., scanners, film readers, etc.) and services
- Warranty Duration – Indicates the length of time the solution was under warranty
- Post Warranty Support – PWS (Dollars) – Presents the cost and characteristics of the maintenance agreement entered into with the vendor
- Length of PWS – Indicates the length of the Post Warranty Support agreement
- Total - Excluding Post Warranty Support – Presents the total cost of implementation and imaging.





**Table 13 - Public Benefit System Demographic Data**

Retirement System	Portfolio Value (\$Billion)	Active Members (000's)	Retirees (000's)	Total (000's)	Number of Employers	Multiple Plans	Multiple Locations	Number of Agency Employees
Milwaukee ERS	3.8	13.8	9.7	23.5	8	Yes	No	27
New Mexico PERA	9.4	50.7	21.3	72.0	158	Yes	Yes	64
Missouri PSRS / PEERS	20.3	145.0	45.0	190.0	533	Yes	No	100
Vermont OST/RD	2.6	31.9	9.3	41.2	800	Yes	No	12
Maine SRS	8.5	55.0	39.0	94.0	654	Yes	No	137
Idaho PERS	6.9	60.5	23.0	83.5	670	Yes	Yes	56
New Hampshire RS	4.0	46.7	14.4	61.1	843	Yes	No	50
Kansas PERS	10.3	148.1	59.1	207.2	1,454	Yes	No	86
San Bernardino County ERA	3.3	15.9	5.5	21.4	18	Yes	No	24
Colorado FPPA	2.7	14.8	6.6	21.4	521	Yes	No	32
Contra Costa County ERA	3.5	9.5	6.0	15.5	18	Yes	No	37
North Dakota RIO	1.5	10.5	5.5	16.0	260	No	No	18
North Dakota PERS	1.6	22.5	6.3	28.8	360	Yes	No	30





**Table 14 - Public Benefit System Implementation Comparables**

Retirement System	Year of Contract	Solution Implementation (\$M)	H/W (\$M)	Total LOB Implementation (\$M)	Imaging H/W, S/W and Services (\$M)	Back-file Conversion (\$M)	Total Imaging Costs (\$M)	Warranty Duration	Post Warranty Support \$	Length of PWS	Total - Excluding Post Warranty Support (\$M)
Milwaukee ERS	2005	11.2	2.5	13.7	0.3	0.7	1.0	6 months	1.7	2 years	14.7
New Mexico PERA	2002	12.0	1.0	13.0	N/A	N/A	N/A	6 months	0.4	5,760 hours	13.0
Missouri PSRS / PEERS	2006	7.6	1.7	9.3	0.8	0.5	1.3	6 months	0.5	1 Year	10.6
Vermont OST/RD	2006	8.1	0.4	8.5	Sep	N/A	N/A	N/A	N/A	N/A	8.5
Maine SRS	2006	6.8	0.8	7.6	N/A	N/A	N/A	6 months	0.8	5 years	7.6
Idaho PERS	1997	6.2	0.8	7.0	0.8	N/A	N/A	3 months	N/A	-	7.0
New Hampshire RS	2001	4.7	0.8	5.5	N/A	N/A	N/A	6 months	3.2	5 years	5.5
Kansas PERS	2004	4.8	0.1	4.9	N/A	N/A	N/A	N/A	N/A	N/A	4.9
San Bernardino County ERA	2001	3.6	0.6	4.2	N/A	N/A	N/A	6 months	N/A	-	4.2
Colorado FPPA	2006	4.0	0.2	4.2	N/A	N/A	N/A	-	-	N/A	4.2
Contra Costa County ERA	2005	2.3	0.3	2.6	NA	N/A	N/A	6 months	N/A	-	2.6
North Dakota RIO	2004	1.8	0.0	1.8	0.1	N/A	0.1	1 Year	0.1	-	1.9





## 10.2 Specific Comparables

As can be seen by reviewing Table 14, the average cost for solution implementations varies from \$6.7M to \$7.1M depending on whether warranties are included or not and whether we eliminate the high and low costs before computing the average. We believe a conservative estimate for planning purposes would be \$6.5 to \$7 million for the application system alone. Additional costs would be required for the implementation (e.g. backfile conversion and Independent Validation and Verification, Quality Assurance and Oversight Project Management services).

But, we caution NDPERS that a number of market-driven factors affect the cost – some logical and able to be explained and others upon which we can only provide comment and not completely explain. These include issues such as:

- “How badly” vendors want business – sometimes they want to enter a new level of the market (and hence heavily discount one project), or they want to avoid having staff on overhead or be forced to “lay them off” for lack of work, etc.
- How badly certain vendors want to “beat” a competitor (and they are willing to lower their prices).
- In other instances, vendors have more work than they can effectively manage; thus while they want to not miss a business opportunity they may be less aggressive in their pricing model.
- The degree of complexity of plans to be administered and the number of benefits and plans that must be coordinated.

## 10.3 Current IT Operating Budget

It is important to point out that, if NDPERS were to elect to do nothing (i.e. not move forward with a legacy application system replacement effort), it would still incur significant annual IT operating costs for a system that is fragile, difficult to maintain, non-integrated and limited in scope and functionality.

Table 15 – IT Operating Costs ITD- and NDPERS-related IT operating costs. It is important to note that some level of NDPERS on-site support will still likely be required even if the legacy system is replaced. Nevertheless, choosing to do nothing (which we do not believe is a real option) carries a continuous and significant real cost.

**Table 15 - IT Operating Costs**

	Projected 2005-2007	Projected 2007-2009
<b>ITD Data Processing Costs</b>	487,788	519,323
<b>PERS IT Staff - 3 FTE (Salary and Benefits)</b>	324,421	350,374
<b>Total Projected Operating Costs</b>	812,209	869,698

## 10.4 Current LOB Implementation Vendors

LRWL has evaluated proposals from and overseen implementation of all of the major solutions available in the public benefit marketplace, including those from BearingPoint, Saber, CPAS, Levi Ray & Shoup, PeopleSoft, Sagitec, Tier, Vitech, and Watson Wyatt. We not only are familiar with their products and





methodologies, we know many of their staff members (and their respective strengths and weaknesses). And, we have evaluated the offerings of several other solution providers – CIBER, Deloitte, Hunter, James Evans & Associates, OptData, TaTa Infotech, etc.

Some of these vendors focus on the larger implementations, some on smaller ones and some on those in between. Several of them appear to have reached their zenith and are not as active (or successful in winning contract awards) as they once were. Others are “up and comers.” We point out that being in either of these positions comes with its own positives and negatives.

Table 16 presents a list of current LOB implementation vendors and the systems that they have implemented or are implementing.

**Table 16 - Current LOB Implementation Vendors**

NBR	COMPANY	PRODUCT NAME	COMMENT	RECENT PROJECTS
1	Accenture		Seem to always want to be a player, but to our knowledge does not have a product for public retirement systems	Recently awarded a \$220M contract with CalPERS with Covansys (now Saber) as a subcontractor
2	Acuent, Inc.		Often as a programming partner with PeopleSoft	We do not know current status
3	Athens Group			<ul style="list-style-type: none"> <li>• Texas Municipal Retirement System</li> <li>• Texas Teachers' Retirement System</li> <li>• Texas County &amp; District Retirement System</li> </ul>
4	Bearing Point (formerly KPMG Consulting) (BP)	POINT, BPAS	Large number of implementations; typically mid-range to large systems	<ul style="list-style-type: none"> <li>• Teachers Retirement System of Georgia</li> <li>• North Carolina Retirement System Division</li> <li>• Louisiana State Employees Retirement System</li> <li>• Employees Retirement System of Georgia</li> </ul>
5	CIBER		Often as a programming partner with PeopleSoft	We do not know current status
6	Saber Consulting, Inc.	jClarety	Large number of statewide implementations, typically mid-range to large systems	<ul style="list-style-type: none"> <li>• New Mexico Public Employees Retirement Association (PERA)</li> <li>• Milwaukee City Employees Retirement System</li> <li>• Indiana Public Employees and Teacher Retirement Fund</li> <li>• Michigan Office of Retirement Services</li> <li>• Employees Retirement System of Rhode Island</li> </ul>
7	CPA Systems, Inc. (CPAS)	CPAS	Canadian firm; to our knowledge only 1 or 2 small US implementations; 48% of the firm is owned by Tier; see below	<ul style="list-style-type: none"> <li>• North Dakota Retirement Investment Office (RIO)</li> <li>• PA Municipal Employees Retirement System being upgraded</li> </ul>





NBR	COMPANY	PRODUCT NAME	COMMENT	RECENT PROJECTS
8	Deloitte Consulting		As a system integrator with a number of package vendors	We do not know who they are teaming with now; in the past it was PeopleSoft and Vitech
9	Gabriel, Roeder Smith & Company (GRS)		Have been trying to get into this business	<ul style="list-style-type: none"> <li>Michigan Municipal Retirement System is the only implementation we know of</li> </ul>
10	Hunter, Inc. (also called Cedar group)			<ul style="list-style-type: none"> <li>New York State Teacher's Retirement System</li> </ul>
11	James Evans & Associates Ltd.	JEA	Canadian firm; to our knowledge no US (but multiple Canadian) clients but have indicated that they would like to break into the US market; seem to favor an Application Service Provider (ASP) approach	We do not know current status
12	Levi, Ray, and Shoup, Inc. (LRS)	PensionGold	Typically smaller implementations – counties, cities, two small statewide systems.	<ul style="list-style-type: none"> <li>New Hampshire Retirement System</li> <li>San Bernardino County Employees Retirement Association</li> <li>other California counties</li> </ul>
13	Mellon Human Resources & Investor Solutions (Buck Consultants) – about to become part of ACS		Bid Massachusetts Teachers Retirement Board with Oracle; have in-house Third Party Administrator (TPA) / service bureau capability	<ul style="list-style-type: none"> <li>Replaced as service bureau in NHRS; still support Virgin Islands Retirement System; have commercial clients</li> </ul>
14	Oracle		Bid Massachusetts Teachers Retirement Board with Buck	We do not know current status
15	PeopleSoft (P/S)	PeopleSoft	Partner with solution vendors; most recently with Cedar (Baltimore-based firm) on New York State Teachers Retirement System (NYSTRS)	<ul style="list-style-type: none"> <li>NYSTRS</li> <li>Delaware Public Employees Retirement System</li> <li>Georgia ERS (being replaced)</li> </ul>
16	Sagitec	NeoSpin Browser-Based Public Benefit Administration	New company; former BearingPoint group	<ul style="list-style-type: none"> <li>Started Kansas Public Employees Retirement System (KPERs) in December 2004</li> <li>Subcontractor consultant to prime at WI ETF</li> <li>About to sign a second statewide solution contract</li> </ul>
17	SAP		Seem to always want to be a player, but to our knowledge does not have a product for public retirement systems	We do not know current status
18	Standard Data Corporation		Claim to have “rights” to a good solution; were a subcontractor on the ill-fated Maryland State Retirement Agency (MSRA) – Syscom project.	We do not know current status





NBR	COMPANY	PRODUCT NAME	COMMENT	RECENT PROJECTS
19	TACS, Inc.		Very small New England cities and towns are their base; technology was not current when we last looked at them	We do not know current status
20	Tata InfoTech Limited		A large portion of their effort is done off-shore	More of a custom build; MA Teachers recently suspended their effort
21	Tier Technologies, Inc.	CPAS – see above	As the system integrator - partner with CPAS (Tier owns a large portion of CPAS)	<ul style="list-style-type: none"><li>• New Mexico ERB</li><li>• Pennsylvania Teachers</li><li>• Pennsylvania Municipal (with CPAS)</li></ul>
22	Vitech Systems Group, Inc.	V3	Company background is from Taft-Hartley plans	<ul style="list-style-type: none"><li>• Ohio Police &amp; Fire Pension Fund</li><li>• Pennsylvania School Employees Retirement System</li><li>• New Mexico Educational Retirement Board</li><li>• Employees Retirement System of Hawaii</li></ul>
23	Watson Wyatt Worldwide		Appear to be “out of this business” – previously several California DB counties; only one small statewide system	We do not know current status
24	Chicago Consulting Actuaries	PenSmart	Appear to have a number of products that could possibly be integrated to provide a solution	We do not know current status
25	LynchVal	LVAdmin	Appear to be more oriented towards smaller clients and focused on valuation and actuarial areas	We do not know current status





## 11 OVERALL RECOMMENDATION

LRWL recommends that NDPERS move forward with the development of an RFP for a legacy application system replacement effort with the subsequent procurement processes.

In the development of this feasibility report, LRWL gathered a breadth of information through reviews of existing reports and documents and meetings with NDPERS management and staff. The following represents the most significant challenges NDPERS faces with their legacy application systems:

- Difficulty in absorbing and supporting new benefit programs
- Non-integrated systems requiring redundant and error-prone data entry
- Extensive manual processing and work-arounds
- Difficulty and uncertainty of outcome when implementing enhancements – application maintenance challenges and instability
- Inherent instability of system
- Significant maintenance required of legacy system
- Built-in functional limitations since the system was built many years ago
- Finding and retaining competent programmers
- System demanding of operational personnel resources (i.e. it is difficult to use rather than aiding users)
- Short retention window for plan history (e.g., defined benefit, health, etc.) – data deleted
- Lack of interactive Web site for employers
- Insufficient built in edit checks for many functions – employer reporting, wage and contribution, etc.
- Insufficient customer relationship tracking

By implementing a new benefit record keeping system, NDPERS will:

- Have functionality spanning plans integrated under one umbrella solution, thereby ensuring the efficient and accurate administration of member benefits
- Increase operating efficiency and ability to deliver timely, accurate services, thereby ensuring the efficient and accurate administration of member benefits
- Decrease training time for new hires through better documentation and workflows, thereby educating members, employers and the public on the value of NDPERS policies and programs, and earning the respect and trust of our clients
- Improve member communications, thereby providing an employee benefit package that is among the best available from public and private employers in the upper Midwest, and educating members, employers and the public on the value of NDPERS policies and programs
- Improve the accuracy of member data, thereby ensuring the efficient and accurate administration of member benefits, and earning the respect and trust of our clients
- Enable electronic interactions with employers, members, and retirees, thereby ensuring the efficient and accurate administration of member benefits, and maintaining the actuarial and financial soundness of the funds
- Eliminate the time lag associated with batch-oriented mainframe systems and replace such with interactive real-time processing, thereby providing an employee benefit package that is among the best available from public and private employers in the upper Midwest.





A high-level list of the benefits NDPERS' stakeholders can expect to see from a system replacement are identified below:

<b><u>Members and Retirees:</u></b>	<b><u>Employers:</u></b>
<ul style="list-style-type: none"> <li>▪ Faster response to inquiries</li> <li>▪ New services</li> </ul>	<ul style="list-style-type: none"> <li>▪ Streamlined reporting</li> <li>▪ Easier training</li> </ul>
<b><u>NDPERS:</u></b>	<b><u>NDPERS Employees:</u></b>
<ul style="list-style-type: none"> <li>▪ Support for increased retirements with minimal increase in staff</li> <li>▪ Easier training</li> <li>▪ Work managed automatically through the system Management information (metrics)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Flexibility in work schedules and locations</li> <li>▪ Improved job satisfaction</li> <li>▪ More focus on higher-value-add tasks and less on tedious, repetitive processes (which can be automated)</li> </ul>
<b><u>All NDPERS Stakeholders:</u></b>	
<ul style="list-style-type: none"> <li>▪ Improved audit capability</li> <li>▪ Ability to meet new and changing requirements more rapidly and more easily</li> </ul>	

Given the costs associated with comparable projects presented earlier in Section 10.1 and the breadth of functionality identified by management and staff during our review, we believe that NDPERS can anticipate cost proposals for a replacement system in the range of \$6.5 - \$7 million.

The project management demands of the implementation effort, following RFP development and procurement, are often more than a retirement system is prepared to shoulder with existing resources. With that in mind, we also recommend that NDPERS procure the services of a firm with extensive experience in Oversight Project Management, Quality Assurance and Independent Validation and Verification support in the public benefit fund sector specifically. Doing so will mitigate a number of the risks associated with an endeavor of this size and duration. NDPERS should anticipate such services, over a 3-year implementation timeframe, requiring additional funding in the area of \$750,000 to \$1 million.

As discussed earlier, the back-file image conversion should cost less than \$200,000.

Finally, NDPERS should anticipate some level of change orders during the implementation process. With this in mind, we recommend establishing a contingency fund of 10% of the estimated system replacement costs.

Given these cost components, the funding level necessary to put in place a modern, integrated benefit and benefit record keeping system that addresses needs that NDPERS staff and management have identified, falls in the range of \$8.0 to \$9.0 million.





## APPENDIX A – GROUP BENEFITS MANAGED AND ADMINISTERED

The table provided below lists group benefits managed and administered by NDPERS:

1/1/2006 Table 1

### STATE OF NORTH DAKOTA GROUP BENEFITS MANAGED AND ADMINISTERED BY NDPERS

PARTICIPATION	RETIREMENT	HEALTH	LIFE	DENTAL	VISION	EAP	DEFERRED COMP	FLEXCOMP	RETIREE HEALTH CREDIT
<b>AGENCY</b>									
State	92	92	92	92	92	92	92	83	92
Counties	44	38	28				40	-	44
School Dist	97	25	3				45	-	97
Cities	70	56	21				23	-	70
Others	55	60	22				22		55
	<b>358</b>	<b>271</b>	<b>166</b>	<b>92</b>	<b>92</b>	<b>92</b>	<b>222</b>	<b>83</b>	<b>358</b>
<b>EMPLOYEES</b>									
State	10,326	13,779	14,575	3,274	2,878	14,575	4,138	7,800	10,326
Counties	3,189	1,757	2,626				1,455	-	3,189
School Dist	4,386	1,150	63				602	-	4,386
Cities	527	1,011	159				350	-	527
Others	431	427	228				190		431
Legislators	0	129						-	
Retirees	6,473	5,208	3,042 (1)	1,083	539		1,100	-	3,745
COBRA		507						-	
	<b>25,332</b>	<b>23,968</b>	<b>20,693</b>	<b>4,357</b>	<b>3,417</b>	<b>14,575</b>	<b>7,835</b>	<b>7,800</b>	
<b>INCOME CONTRIBUTIONS</b>	8.12% Gross Annual Payroll	\$260.62 Individual \$643.12 Family (Rates differ for retirees & political subdivisions)	\$1,300 @ .28/Month + Supplemental Contributions	Full cost of the Dental Plan is paid by the member.	Full cost of the Vision Plan is paid by the member.	Per Contract cost of \$1.42 per month.	Level of Participation Decided by Employees	Level of Participation Decided by Employees	1% of Gross Annual Payroll
<b>FINANCIAL</b>									
Estimated Annual Receivables	\$44,000,000	\$140,000,000	\$2,400,000	\$1,900,000	\$300,000	\$250,000	\$11,550,000	\$5,142,000 + Pretax Amount \$1,100,000	\$5,250,000
Estimated Annual Payables	\$56,000,000	\$140,000,000 (4)	\$2,400,000 (2)	\$1,700,000 (5)	\$300,000	\$250,000	\$3,000,000	\$5,142,000 (3)	\$4,200,000
Total Assets	\$1,480,000,000 (6)						\$91,000,000		\$33,915,000
(1) Full cost paid by retiree @ \$1,300 limit (2) Estimated based on past experience (3) Assumes all deferrals are claimed (4) Plan is fully insured by BCBS (5) Plan is fully insured by ReliaStar (6) Excludes \$13 million in D.C. 401(a) assets									





## APPENDIX B – RETIREMENT SYSTEMS MANAGED AND ADMINISTERED

The table provided below lists retirement systems managed and administered by NDPERS:

6/30/2005 Table 2

### STATE OF NORTH DAKOTA RETIREMENT SYSTEMS MANAGED AND ADMINISTERED BY NDPERS

	<i>Main</i>	<i>Highway Patrol</i>	<i>Job Service</i>	<i>Judges</i>	<i>Guard</i>	<i>Law Enforce with Main Service</i>	<i>Law Enforce w/o Main Service</i>	<i>401(a) Defined Contribution</i>	<i>RETIREE HEALTH CREDIT</i>
<b>PARTICIPATION</b>									
<b>AGENCY</b>									
State	92	1	1	1	1			92	92
Counties	44					6	1		44
School Dist	97								97
Cities	70					3			70
Others	55								55
<b>TOTAL</b>	<b>358</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>				<b>358</b>
<b>EMPLOYEES</b>									
State	9,762	125	52	46	14			252	9,762
Counties	3,083					88	13		3,083
School Dist	4,378								4,378
Cities	503					25			503
Others	427								427
Legislators	0								
Retirees	5,921	92	217	25	4	0	0	42	<b>3,682</b>
<b>TOTAL</b>	<b>24,074</b>	<b>217</b>	<b>269</b>	<b>71</b>	<b>18</b>	<b>113</b>	<b>13</b>	<b>294</b>	
<b>FINANCIAL</b>									
Contributions	8.12% Gross Annual Payroll	16.70% Gross Annual Payroll	7.00% Gross Annual Payroll	14.52% Gross Annual Payroll	8.33% Gross Annual Payroll	8.31% Gross Annual Payroll	6.43% Gross Annual Payroll	8.12% Gross Annual Payroll	1% of Gross Annual Payroll
Total Assets	\$1,403,066,411	\$47,179,197	\$81,508,999	\$25,165,175	\$1,693,912	\$3,032,184	\$48,711	\$13,047,045	\$33,915,161





## APPENDIX C – INVENTORY OF SPREADSHEETS USED BY NDPERS

The following table provides a list of Excel spreadsheets used by NDPERS staff and management to supplement functionality missing from the currently system:

<b>Name of Spreadsheet</b>	<b>Associated Plan or Program</b>	<b>Purpose</b>	<b>User</b>
FlexComp Reconciliation 2006	FlexComp	Where the central/supplemental payroll reports are placed to use in posting the deposit to the cash receipts journal, FlexComp CRJ FY 2006	Sharon E
FlexComp CRJ FY 2006	FlexComp	Used to list all deposits from Employers not on the Central Payroll system	Sharon E
FlexComp Disbursement Log 2006	FlexComp	List my daily check numbers and amount and advice numbers and amount off reports I receive once the claims payment process is completed	Sharon E
FlexComp Deposits by Employers	FlexComp	Used to list all deposits from Employers not on Central Payroll reporting	Sharon E
IBS Totaling	IBS Payments	List my daily check amounts and advice amounts off payments I receive	Michele
Deferred Comp - Transmittal Login	Deferred Comp Payments	List dates that transmittals are received for Deferred Comp, verify they're in by due date, ensures all have been received	Michele
Transmittal Batch Sheets	Deferred Comp Payments	Used to batch transmittals that are received in order to key and balance the transmittals daily	Michele
DC Plan – A new DC transfer & A new NG DC transfer	Defined Contributions	Used to estimate defined contribution option	Michele
Missed Contribution Master	Missed Contributions	Used to estimate interest and amount due from agencies that miss a member's contributions	Michele
Purchase of Service Deposits	Purchase of Service	Track monies received by date, amount, member name and type of purchase	Michele
Rollover Purchases	Purchase of Service	Track monies received for rollovers by amount received by type of rollover plan	Michele
Deposits	Purchase of Service	Track amount of deposit completed daily for input into Cash Receipts Journal	Michele
Gr 007 & 009 Insurance Worksheet	Group Insurance	Track changes for insurance deductions that are keyed by Kristi (Rebecca)	Michele





<b>Name of Spreadsheet</b>	<b>Associated Plan or Program</b>	<b>Purpose</b>	<b>User</b>
RIO Insurance Worksheet	Group Insurance	Track changes for insurance deductions that are sent to RIO	Michele
Adjustments	Food Stamp Bonus & other adjustments	Used to list multiple salary adjustments to a member's account	Michele
Travelers Monthly COLA Authorization - Reconciliation	Retirement	Basis for establishing amount of travelers benefit checks	Diane
PERS AUTH-PD-UP Annuity Check	Retirement	Basis for establishing amount of Job Service benefit checks (non-travelers)	Diane
Object codes	Peoplesoft	Peoplesoft Object Codes	Tammy
FlexComp.xls	FlexComp	Used to reconcile FlexComp bank statement	Tammy
Cash distribution	Retirement	Used to prepare audit confirmations of ret. Contrib. made by ers for fiscal year. Compiled from cash distribution reports	Tammy
Out of State Travel	All programs	Used to record travel for budgeting purposes	Tammy
Def Comp bank reconciliation	Deferred Comp	Used to reconcile deferred comp	Tammy
TAP123	FlexComp	FlexComp outstanding check list	Tammy
Data collection 2006	All programs	Data collection report	Tammy
Leave reports	Leave plans	Tracks leave accrued & taken	Tammy
Monthly Work Totals	Adm. Services	Track monthly totals of tasks performed	Cindy
Daily Time Spent on Mail	Adm. Services	Track daily time spent on processing incoming and outgoing mail	Cindy
Monthly Data Collection	Adm. Services	Track monthly time spent on correspondence	Cindy
Postal Account #37 (bulk mail account)	Adm. Services	Track postage dollars for bulk mailings	Cindy
Postal Account #540 (postage due account)	Adm. Services	Track dollars spent on postage due	Cindy
Postal Account #578 (business reply account)	Adm. Services	Track dollars spent on business reply mail	Cindy
Postage Balance	Adm. Services	Track money that we have at Pitney Bowes to process daily outgoing mail (breaks postage down by program/type of mail)	Cindy
New Retiree Spreadsheet	Adm. Services	Tracks paper processing of a new retiree	DB Plans





<b>Name of Spreadsheet</b>	<b>Associated Plan or Program</b>	<b>Purpose</b>	<b>User</b>
Health/Life Data Entry Verification	Adm. Services	Tracks data verification of health and life applications	Cheryl
Monthly Data Collection Summary Form	Adm. Services	Tracks tasks done in the retirement division by task	Barry
Log Sheets for Alternative Retirements	Adm. Services	Record the form received from alternative retirees and nearing age 65 letters	Geri
Medicare Part D Worksheets	Adm. Services	Collect information from MedicareBlue Rx applications for electronic mailing to BCBS	Geri
Health Monthly	Adm. Services	Information collected from Bryon for nearing age 65 members for merge letters	Geri
Drop dependent monthly files	Adm. Services	Monthly information collected for dependents nearing ages 23 & 26	Geri
Dental and Vision 2006	Adm. Services	Track individuals on COBRA dental and vision and the monies received (check numbers)	Geri
Life Claims Paid	Adm. Services	Track life insurance claims paid on a monthly basis	Kim
Def Comp Provider Rep Education List	Adm. Services	Track def comp provider reps continuing education	Kim
Disability Cases to Mid Dakota	Adm. Services	Track disability cases sent to Mid Dakota physician for review	DB Plans
Cash Receipts Journal	Group Insurance	Record daily deposits.	Vickie
Insurance Adjustment Worksheets	Group Insurance	Record of Health & Life Adjustments to be balanced with carriers.	Vickie
Pay Direct Worksheet	Group Insurance	Reconcile Monthly Health, Life, & EAP Ins premiums for pay-direct agencies.	Vickie
Central Payroll Worksheet	Group Insurance	Reconcile Monthly Health, Life, & EAP Ins premiums for Central Payroll and IBS groups.	Vickie
IBS Worksheets	Group Insurance	Worksheets to balance 18 individuals pay-direct groups.	Vickie
Fund Benchmarks Q12006	Research	Investment Fund Benchmarks	Bryan
Fund Research Q12006	Research	Investment Statistics	Bryan
Fund Style Box	Research	Investment Fund Movement	Bryan





<b>Name of Spreadsheet</b>	<b>Associated Plan or Program</b>	<b>Purpose</b>	<b>User</b>
Health Rates 05-07	Research	Health Plan Rates	Bryan
Lifetable05	Research	Life Plan Rates	Bryan
ICD2003	Research	Inpatient Utilization Comparison	Bryan
Quarter	Research	Health Plan Utilization for active/retiree employee/dependent breakdown – Used for quarterly graphs and much more	Bryan
Surp0406	Research	Monthly Health Plan Financial Surplus Projection	Bryan
Disability Listing	Defined Benefit	Disability listing to track for recertification	Sharmain
FAS worksheet	Defined Benefit	Recalculation final average salary	Sharmain
Health Credit recalculation worksheet	Defined Benefit	Recalculation of health credit	Sharmain
Joint & Survivor Exclusion Ratio	Defined Benefit	Calculate exclusion ratio	Sharmain
FAS Indexing Calculation	Defined Benefit	Final average salary calculation	Sharmain
Manual Checks_13 <sup>th</sup>	Defined Benefit	To generate 13 <sup>th</sup> check to annuitants 1/1/06	Sharmain
Hp Indexing Worksheet	Defined Benefit	Annual index to HP deferred retirees	Sharmain
Status 49 Master	Defined Benefit	Track lost members	Sharmain
Sick Leave Calculation Table	Defined Benefit	Sick leave conversion calculation	Sharmain
Benefit recalculation worksheet	Defined Benefit	Correct error in calculation or do J & S pop-up	Sharmain
Benefit Verification Worksheet	Defined Benefit	Provides detail of benefit amount upon request	Sharmain
Repayment Conversion Worksheet 100% J & S	Defined Benefit	Calculation for overpayment of J & S 100% benefit	Sharmain
Repayment Conversion Worksheet.2	Defined Benefit	Calculation for overpayment of Single Life benefit	Sharmain
Prior Service	Defined Benefit	Roster of prior service annuitants	Sharmain
Term Certain options 12-8-05	Defined Benefit	List of all term certain annuitants	Sharmain
Single Life Exclusion Ratio	Defined Benefit	Calculate single life ratio	Sharmain
415TEST with new limits effective 1-04	Defined Benefit	415 limit test	Rebecca
Sick leave worksheet calculation for National Guard	Defined Benefit	Sick leave conversion calculation	Rebecca
Purchase Highway Patrol Revised with New Factors	Defined Benefit	Purchase calculations for Highway Patrol	Rebecca
Sick leave worksheet calculation for HP	Defined Benefit	Sick leave conversion calculation	Rebecca
Sick leave worksheet calculation	Defined Benefit	Sick leave conversion calculation	Rebecca





<b>Name of Spreadsheet</b>	<b>Associated Plan or Program</b>	<b>Purpose</b>	<b>User</b>
Purchase Judges Revised with New Factors	Defined Benefit	Purchase calculations for Judges	Rebecca
Sick leave worksheet calculation for LE w/prior service	Defined Benefit	Sick leave conversion calculation for Law Enforcement with prior service	Rebecca
Purchase worksheet revised 6-02	Defined Benefit	Purchase calculations	Rebecca
Sick leave worksheet for LE w/o prior service	Defined Benefit	Sick leave conversion for Law Enforcement without prior service	Rebecca
Highway Patrol Employee Contribution Calculation	Defined Benefit	Calculate employee contribution under USERRA	Rebecca
National Guard Employer Contribution	Defined Benefit	Calculate employer contribution under USERRA	Rebecca
Employee Contribution Calculation Worksheet	Defined Benefit	Calculate employee contribution under USERRA	Rebecca
Highway Patrol Employer Contribution Calculation	Defined Benefit	Calculate employer contribution under USERRA	Rebecca
Employer Contribution Calculation Worksheet	Defined Benefit	Calculate employer contribution under USERRA	Rebecca
TIAASTMT	Defined Benefit	Annuity contribution statement	Rebecca
Account Balance Interest Computation	Defined Benefit	Interest calculation for underpayment	Rebecca
Addition adjustment to paid annuitants	Defined Benefit	Calculate year to date, life to date, due to additional benefits paid	Rebecca
Overpayment Test	Defined Benefit	Calculate interest for overpayment	Rebecca
Benefit	Defined Benefit	Benefit verification	Rebecca
Subtraction Adjustment to Paid Annuitants	Defined Benefit	Calculate year to date, life to date, due to benefits returned	Rebecca
Underpayment Test	Defined Benefit	Calculate interest for underpayment	Rebecca
Underpayment	Defined Benefit	Calculate underpayment amount	Rebecca
Interest for returned rollover	Defined Benefit	Calculate interest for returned refund/rollover	Rebecca
Alternate Payee Interest Calculation	Defined Benefit	Calculate interest for alternate payee account	Rebecca
Reduced Test Calculation on Member Account Balance w/QDRO for HP	Defined Benefit	Calculation to test reduced benefit	Rebecca
Reduced Test Calculation on Member Account Balance w/QDRO	Defined Benefit	Calculation to test reduced benefit	Rebecca





<b>Name of Spreadsheet</b>	<b>Associated Plan or Program</b>	<b>Purpose</b>	<b>User</b>
Unreduced Test Calculation on Member Account Balance HP Member	Defined Benefit	Calculation to test unreduced benefit	Rebecca
Unreduced Test Calculation on Member Account Balance	Defined Benefit	Calculation to test unreduced benefit	Rebecca
CCD	Cash Distribution	To daily reconcile retirement contributions processed by daily batches off files, or discs received by agencies.	Raleigh
CRJ	Cash receipts Journal	To reconcile batch processing of accounts against money received from agencies that are deposits in the bank on a daily basis.	Raleigh
Deposit	Money Deposited	To allocate on a daily basis the amount designated to be deposited in the Money Market account and the Prefunding bank account.	Raleigh
Checkwrite	Benefit Payment	To reconcile on a monthly basis the difference in total benefits paid each month to retirees.	Raleigh
1099R Reconciliation	Accumulation of Federal W/H and Taxable wages	To reconcile on a monthly basis the accumulation of refunds and annuitant's taxes and taxable income.	Raleigh
DC Plan	Defined Contribution Plan	To calculate projections and actual amounts to be transferred for people eligible for that retirement plan.	Raleigh
Defined Contributions	Defined Contribution Plan	To record on a monthly basis the contributions made to the member and balance transferred on behalf of the member.	Raleigh
Missed Contributions	Missed Deposits	To calculate billings for agencies who have missed paying contributions on eligible members including interest. This also includes refunds to agencies.	Raleigh
Missed Contributions	Missed Deposits	To calculate 7.5% interest due employee upon payment of missed deposit.	Raleigh
Voided Checks	Journal Entry	Monthly entry to void outstanding checks.	Raleigh
415 Spreadsheet	Purchase Limits	To verify purchaser of service time with the 95 limits does exceed his maximum payment amount.	Raleigh





<b>Name of Spreadsheet</b>	<b>Associated Plan or Program</b>	<b>Purpose</b>	<b>User</b>
Transmittal Log	Wage reporting	To track reporting and payment of member agencies on a daily basis during monthly accounting period.	Raleigh
TIAA CREF	Transfers to that plan	To calculate transfers of funds to TIAA CREF on behalf of members switching to that plan	Raleigh
State Treasurer's Deposit	Funding Bank Accounts	To calculate estimation of replenishing bank accounts on a monthly basis.	Raleigh
Fidelity	Verification of DC Plan Transfers	To record DC plan transfers to Fidelity to after wire is made.	Raleigh
Leave	Reconcile NDPERS Leave balances	To reconcile our worksheet to the people soft leave balance reports on a monthly balance for NDPERS employees.	Raleigh
Time Sheets	Reporting Leave	To track monthly usage and accumulation of annual leave, sick leave, and comp time.	Every body
Accounts receivable subsidiary ledger	Retirement/group insurance/deferred comp	Provides a detailed listing to support the accounts receivable balance in the general ledger	Accounting
Accounts payable subsidiary ledger	Retirement/group insurance/deferred comp	Provides a detailed listing to support the accounts payable balance in the general ledger	Accounting
Prepaid contributions subsidiary ledger	Retirement/group insurance	Provides a detailed listing to support the prepaid accounts balance in the general ledger	Accounting
Journal entry templates	all	Templates used to record information from various source documents into the necessary format to get posted to general ledger (there is no interface between any of our business systems and the G/L)	Accounting
Blue Cross Blue Shield Interest Calculation Reconciliation	Internal Audit (IA)	Reconcile health insurance activity	Internal Audit
Central Payroll Reconciliation	IA (should be Accounting)	Reconcile Central Payroll Contributions to the deposit posted on the CRJ	Internal Audit
Contributor Master Reconciliation	IA (should be Accounting)	Reconcile contribution activity on the mainframe	Internal Audit
Minimum Guarantee Reconciliation	IA (should be Accounting)	Reconcile benefit payments activity on the mainframe	Internal Audit





<b>Name of Spreadsheet</b>	<b>Associated Plan or Program</b>	<b>Purpose</b>	<b>User</b>
FlexComp Reconciliation	Accounting	Reconcile FlexComp activity to the GL	Michele
Deferred Comp Cash Receipts Journal	Accounting	Cash Receipts Journal for contributions received	Internal Audit
Deferred Comp Age 70 1/2 calculation	Accounting	Test to determine if participating member has reached age 70 1/2	Accounting
Deferred Comp Exception Reconciliation	Accounting	Reconcile Central Payroll Contributions to the mainframe	Internal Audit
Deferred Comp Fidelity Wire Transfer form	Accounting	Form to input amount to be wired to Fidelity	Internal Audit
Deferred Comp Replacement Transmittal	Accounting	Transmittal form used for corrections to data entry errors	Internal Audit
Deferred Comp Transmittal Batch Sheets	Accounting	Batch headers for posting contributions to mainframe (3 types)	Internal Audit
Deferred Comp Reconciliation Worksheets	Accounting	Worksheets to reconcile provider reports to employer transmittals	No staff to do this at this time
Political Sub survey statistics	Health Insurance	Track minimum contribution of health premium for participating political division groups to ensure compliance with policy	Cheryle
Project Time Management worksheet	Internal Audit	To track time spend on various audits and projects throughout the workday	Internal Audit
Audit Tracking worksheet	Internal Audit	To track various audits in progress and completion percentage	Internal Audit
Sample Selection worksheet	Internal Audit	To select sample for testing purposes	Internal Audit





## APPENDIX D – ALLOCATION OF PROJECT COSTS OVER 10-YEAR TIMELINE

The following table presents an allocation of project costs as estimated by ITD and LRWL.

Cost Comparison of Replacement Approach for NDPERS Legacy Application System													
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total	
1	Develop Benefit System through ITD	Estimated Cost	\$0	\$2,523,833	\$2,323,833	\$3,073,833	\$1,846,951	\$215,340	\$215,340	\$215,340	\$215,340	\$215,340	\$10,845,151
	a System Replacement (40 months)	\$6,100,000	\$0	\$1,830,000	\$1,830,000	\$1,830,000	\$610,000						\$6,100,000
	b IV&V/QA/OPM services	\$1,111,111	\$0	\$333,333	\$333,333	\$333,333	\$111,111						\$1,111,111
	c Backfile Conversion	\$200,000	\$0	\$200,000	\$0	\$0							\$200,000
	d Contingency Fund (25%)	\$1,500,000	\$0	\$0	\$0	\$750,000	\$750,000						\$1,500,000
	e Additional Staffing (4 FTE)	\$160,500	\$0	\$160,500	\$160,500	\$160,500	\$160,500						\$642,000
	f ITD Hosting	\$64,140	\$0	\$0	\$0	\$0	\$64,140	\$64,140	\$64,140	\$64,140	\$64,140	\$64,140	\$384,840
	g ITD Out-year Support	\$151,200	\$0	\$0	\$0	\$0	\$151,200	\$151,200	\$151,200	\$151,200	\$151,200	\$151,200	\$907,200
2	Procure Benefit System from Vendor	Estimated Cost	\$316,720	\$3,027,167	\$3,177,167	\$3,177,167	\$424,640	\$264,140	\$264,140	\$264,140	\$264,140	\$264,140	\$11,126,840
	a RFP development	\$316,720	\$316,720	\$0									\$0
	b System Replacement	\$7,000,000	\$0	\$2,333,333	\$2,333,333	\$2,333,333							\$7,000,000
	c IV&V/QA/OPM services	\$1,000,000	\$0	\$333,333	\$333,333	\$333,333							\$1,000,000
	d Backfile Conversion	\$200,000	\$0	\$200,000	\$0	\$0							\$200,000
	e Contingency Fund (10%)	\$700,000	\$0	\$0	\$350,000	\$350,000							\$700,000
	f Additional Staffing (4 FTE)	\$160,500	\$0	\$160,500	\$160,500	\$160,500	\$160,500						\$642,000
	g ITD Hosting	\$64,140	\$0	\$0	\$0	\$0	\$64,140	\$64,140	\$64,140	\$64,140	\$64,140	\$64,140	\$384,840
	h Vendor Out-year Support		\$0	\$0	\$0	\$0	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$200,000	\$1,200,000





## APPENDIX E – SUMMARY OF RECOMMENDATIONS

The table provided below lists all of the recommendations made in the report:

Recommendation	Section of Report
Collect more efficiency, workflow, accuracy, and customer service metrics	3.3.2
Affirm data and software quality as organizational priorities	3.5.4
Develop and maintain a data dictionary.	3.5.5
Pursue replacement of the legacy application system and not maintain and enhance that system.	6.3
Pursue a level of integration that will allow NDPERS to put most work processes under workflow management control but retain the ability to process work outside of the workflow management system on an exception-only basis	8.1
Web-based services should be rolled out in phases, limiting the scope of any single phase to that which can be adequately supported by retirement system staff	8.3.1
Begin verifying the accuracy and integrity of data maintained within the various systems it administers, or consider including responsibility for a data cleansing effort within the scope of activities included in the system replacement RFP	8.3.5
Data remediation process should include providing a detailed audit history report of all data changes and adjustments	8.3.5
Assign primary responsibility for data conversion to the LOB vendor	8.3.6
The LOB vendor should also be required to conduct multiple tests of the conversion	8.3.6
The new solution should be implemented in distinct phases	8.3.6





<b>Recommendation</b>	<b>Section of Report</b>
Assign responsibility for the development of written procedures, methods, and checklists for balancing and reconciling the conversion and bridging of data between the legacy environment and the new environment to the LOB vendor	8.3.6
Require the LOB vendor to provide the hardware	8.3.7
Bundle the purchase of commodity software with the benefit application procurement	8.3.8
Require LOB vendors to provide a warranty on the delivered solution	8.3.11
Require each vendor, regardless of the option required by NDPERS, to provide an estimate of both hours (broken down by skill level) and cost of the post-warranty operations and IT support	8.3.12
Require the vendors to specify the level of NDPERS participation (in person hours) that will be required	8.3.14
Provide a dedicated, sufficiently equipped workspace large enough to accommodate all NDPERS' project team members and solution vendor personnel.	9.1
Commit an adequate number of the right staff members to the project: <ul style="list-style-type: none"><li>▪ A close to full-time project manager</li><li>▪ A Steering committee</li><li>▪ A project management team</li><li>▪ Subject Matter Experts (SMEs)</li></ul>	9.2
Acquire the services of an outside oversight project manager to add to the PMO capabilities	9.5
Move forward with the development of an RFP for a legacy application system replacement effort and with the subsequent procurement processes.	11
Establishing a contingency fund of 10% of the estimated system replacement costs	11



