

STATE OF NORTH DAKOTA



IT Organization and Management Study

February 2, 2004

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CHAPTER

1

executive overview

State of North Dakota
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February 2, 2004

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A. INTRODUCTION

In August of 2003, the Interim Information Technology Committee of the North Dakota Legislative Council engaged Pacific Technologies, Inc. (PTI) to conduct a state-wide information technology (IT) organization and management study.

The scope of work, as provided for in Section 13 of 2003 House Bill 1505, focused on:¹

- ◆ Analyzing the labor effort devoted to IT at the State of North Dakota (the State)
- ◆ Reviewing the State's approach to managing that labor effort
- ◆ Evaluating IT-related decision processes
- ◆ Reviewing state-wide IT initiatives
- ◆ Comparing North Dakota's IT service delivery approach and spending levels to other states
- ◆ Making recommendations intended to reduce long-term costs, improve service delivery, enhance visibility into and understanding of the State's IT labor effort, and position the State to effectively manage IT over the long term

Pacific Technologies supported the effort through interviewing representatives from over 35 state agencies, surveying other states, analyzing detailed information about state-wide IT labor effort and management structures, and reviewing relevant budget, planning, and operational documentation. We also provided monthly updates to the Interim Information Technology Committee and to the State Information Technology Advisory Committee (SITAC).

Several long-term IT goals for the State proved central to the study and should be kept in mind in when reviewing this report. The following strategic imperatives – rather than a singular focus on cost savings – drove our recommendations:

- ◆ *Provide basic IT services as a state-wide "utility" – highly available, consistent, and configured to maximize economies of scale*
- ◆ *Performance manage IT at both the agency and enterprise levels*
- ◆ *Adopt best practices, where they make sense*
- ◆ *Favor long-term improvement over short-term considerations*

Within this overall context, the table on the next page distills the major findings, recommendations, and benefits presented in this study.

¹ Note that the scope did not include reviewing the State's application software or technical infrastructure. Our analysis encompassed the Judicial, Legislative, and Executive branches. We did not receive data from the university system. Correspondingly, the university system was excluded from our analysis. Unless specifically noted otherwise, all results assume that staff transitions related to House Bill 1505's consolidation of server administration functions have already occurred.

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IT Organization and Management Study Summary

Key Findings	Major Recommendations	Primary Benefits
1. The State has a highly-fragmented approach to help desk services and workstation support	Consolidate all labor associated with installing, maintaining, and supporting personal computers within the Information Technology Department (ITD)	<ul style="list-style-type: none"> ◆ Positions the State's computing environment for the long term ◆ Allows agencies to focus on core business needs – rather than technical infrastructure ◆ Leads to long-term labor cost savings
2. Inconsistent standards and policies surround workstation platforms, configurations, and replacement	Move to a highly standardized workstation environment on a state-wide basis – with ITD managing the replacement cycles	<ul style="list-style-type: none"> ◆ Improves State purchasing power and license management ◆ Enhances information sharing and staff productivity via common, current PC tools ◆ Promotes basic IT service provision as a “utility” across the State
3. The State can achieve additional savings and improve alignment with long-term goals (post-HB 1505) through continued server consolidation efforts	Consolidate all servers into ITD – reducing over 150 servers from the State's inventory and making corresponding reductions to agency and ITD server administration labor	<ul style="list-style-type: none"> ◆ Allows agencies to focus on core business needs – rather than technical infrastructure ◆ Promotes basic IT service provision as a “utility” across the State ◆ Leads to long-term labor and hardware cost savings
4. The State lacks consistent methods, tools, and performance measures to assess and prioritize requests for major IT investments	Build on existing IT governance processes – including mechanisms for cost containment and meaningful state-wide IT management reporting	<ul style="list-style-type: none"> ◆ Better-informed IT decision making ◆ More equitable, business-based, and consistent evaluation of IT initiatives ◆ Best opportunity to manage application portfolio costs

While these recommendations centralize delivery of IT infrastructure-related services, they retain a federated IT service model at the State. In particular, *this approach leaves the sourcing of business application service labor under the agencies' control.*

The remainder of this chapter highlights associated results of the work, as follows:

- B. Strengths
- C. Current North Dakota Position
- D. Key Recommendations
- E. Transition and Implementation Plans
- F. Conclusion

B. STRENGTHS

Oftentimes, engagements of this nature focus exclusively on areas for improvement. It is worth noting that our work identified a variety of positive attributes surrounding IT at the State. This section briefly describes several key IT strengths that surfaced from our analysis.

THE STATE THOROUGHLY UNDERSTANDS ITS IT LABOR COSTS AND LABOR DISTRIBUTION

Largely as a result of this study, and building upon the work started by HB 1505, *North Dakota has an in-depth understanding of its IT labor expenditures*. This understanding provides a basis for making informed choices about changes to IT service delivery at the State. It can also serve as a starting point for establishing labor-based performance measures for information technology services. North Dakota is significantly ahead of most other states in this regard. Our external survey did not find any other states that had a complete model of their IT labor expenditures.

NORTH DAKOTA HAS A STRONG COMMITMENT TO INVESTING IN IT SUPPORT

Pacific Technologies analysis found that, on a state-wide basis, *North Dakota adequately staffs virtually all major IT functions*. This willingness to invest has reaped benefits for the State, including high levels of customer satisfaction and an ability to devote significant labor effort to the State's application portfolio.

THE STATE IS AHEAD OF MOST STATES ON A NUMBER OF ENTERPRISE IT INITIATIVES

North Dakota's *extensive wide area network and functional state-wide GIS* bring clear benefits to the State – and place North Dakota ahead of the curve in these areas on a national basis. The ConnectND project, once complete, will also be unique in the breadth of its scope. Our survey did not reveal any other states using a single, integrated, finance and human resources system across all three branches of government and the State University system.

NORTH DAKOTA HAS MADE POSITIVE, INITIAL STRIDES TOWARD EFFECTIVE IT GOVERNANCE

The recently-established State Information Technology Advisory Committee serves as an advisory body to the Chief Information Officer (CIO). This group includes selected agency heads from across the State as well as private sector and legislative representation. In addition, North Dakota has an enterprise architecture project under way. This effort will result in the definition of technical standards across the State. Both of these initiatives reflect *best practices in state IT governance*.

C. CURRENT NORTH DAKOTA POSITION

This section presents our findings regarding IT organization, service delivery, and governance at the State.

1. IT ORGANIZATION AND SERVICE DELIVERY

Pacific Technologies analyzed all IT labor costs at the State (including full-time, part-time, "shadow," and contract effort) and reviewed the distribution of that labor across agencies. We also compared North Dakota's IT operating cost and labor distribution to other states. This section summarizes our findings.

To conduct the labor analysis, we gathered data on IT labor related to over 25 IT activities (e.g., workstation administration, database administration, etc.) based on a staffing model provided by Pacific Technologies and completed by agency personnel.² Appendices to this report present the

² Of the 52 agencies contacted, we received 40 responses. The non-responding agencies were small, no more than 350 FTE in total, so their absence from the analysis does not have a material impact on the results.

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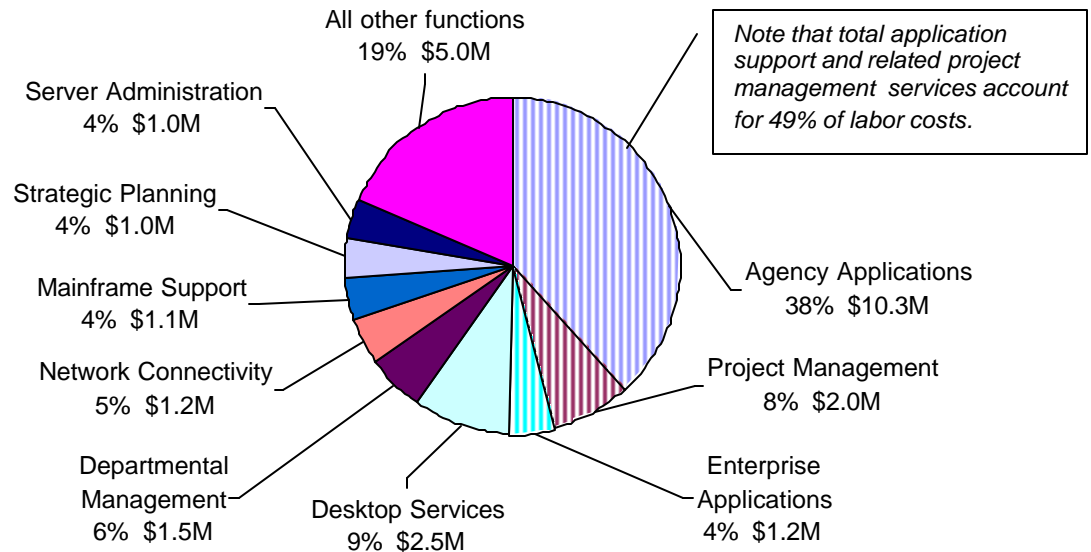
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detailed labor data. *Please note that this analysis relies on self-reported agency information – and is best viewed as an approximation. The associated figures are likely to change as implementation of our recommendations progresses.*

NORTH DAKOTA IT LABOR COSTS

Pacific Technologies found that the State's annual IT labor expenditure is approximately \$26.9 million – split almost evenly between ITD at \$13.1 million and the agencies at \$13.8 million. The following table summarizes the IT labor cost data:

IT Labor Cost by Category



As the call-out box indicates, almost 50% of the State's IT labor goes toward application development and maintenance (i.e., the combined totals of the Agency Applications, Project Management, and Enterprise Applications categories depicted above). This percentage is higher than our typical experience in the public sector, where we usually see between 35 and 45 percent of IT labor effort devoted to application support.

Labor costs in this area have two primary drivers: agency business need and the architecture of the State's application portfolio. Since IT governance processes serve as the primary mechanism for evaluating agency business need, **North Dakota will need to streamline its application portfolio and refine its approach to IT project approval processes to significantly impact application-related labor expenditures – currently totaling more than \$13 million on an annual basis.** As previously indicated, a review of the State's application portfolio was not within Pacific Technologies' scope of work for this study.

Desktop Services, a category that includes all labor associated with installing, maintaining, and supporting the use of the State's personal computers, forms the second largest expenditure area. Our analysis indicated that this labor effort totals approximately 52 full time equivalents (FTEs), representing the full or part-time work of approximately 152 separate individuals spread across virtually all of the responding agencies.

When we consider the number of workstations at the State (approximately 7,700), we find a ratio of 149 PCs to each FTE of support effort. This number falls in the typical range that we observe in the public sector, where we usually see support ratios ranging from 100 to 150 workstations per support FTE. **Given the highly-fragmented nature of the delivery of this service, and the wide variety of**

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workstation configurations deployed, Pacific Technologies does not believe significant efficiencies can be achieved in this area without radically changing both the service delivery approach and the State's mechanisms for refreshing its workstation inventory.

The remaining spending categories encompass relatively small individual expenditures spread across a large number of agencies. Potential savings in these areas may not justify the effort required to achieve them.

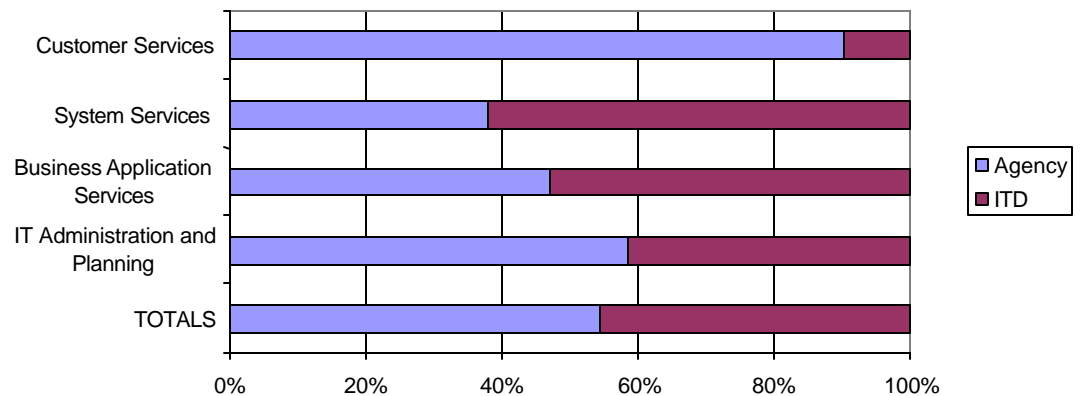
DISTRIBUTION OF IT LABOR

To analyze the State's level of IT labor centralization, we summarized the labor data into four major categories, or IT functional areas:

- ◆ Customer Services – functions related to directly supporting users of IT systems and services
- ◆ System Services – functions related to implementing, maintaining, and supporting the organization's computers, systems software, and network connectivity
- ◆ Business Application Services – functions related to providing, maintaining, and supporting the use of software needed to meet the operational, management, and reporting requirements of the organization
- ◆ IT Administration and Planning – functions related to the planning, oversight, security, and day-to-day operations of the technology function at the organization

The following two exhibits compare agency versus ITD labor effort across the above categories.

Percentage ITD Versus Agency Labor Effort by IT Functional Area



Distribution of FTE's³ by IT Functional Area

IT Functional Area	Agency FTE's	ITD FTE's	Total FTE's
Customer Services	67	7	74
System Services	33	59	93
Business Application Services	91	101	192
IT Administration and Planning	54	38	92
TOTALS	246	205	451

Note: Values in table rounded to whole numbers

As the tables indicate, significant IT support effort occurs in the agencies. **Of the approximately 451 total FTEs of IT labor, agencies deliver approximately 55%, or about 246 FTEs of staffing.**

³ The FTE levels presented in this table, as well as the rest of this document, refer to the complete level of effort encompassing full-time and part-time staff, as well as shadow and contract labor.

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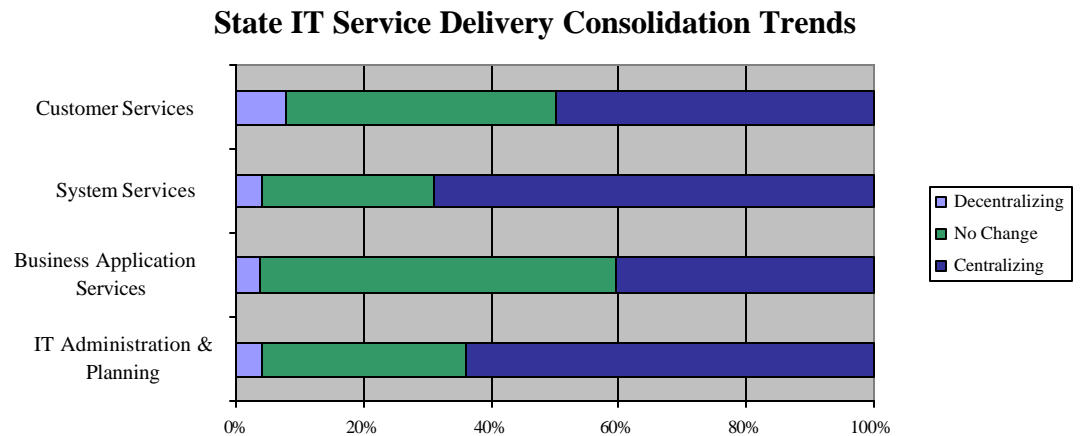
Clearly, Customer Services appears heavily decentralized, while Business Application Services and IT Administration and Planning are more evenly split. It is worth noting that the server consolidation effort resulting from House Bill 1505 has reduced total server administration labor costs by approximately 6 FTEs, with further reductions anticipated as ITD consolidates servers and reduces the associated workload. Approximately 30% of server support effort remains in the agencies, a percentage that will increase as ITD reduces servers and associated support staff.

COMPARISON WITH OTHER STATES

PTI received data from 31 other states regarding trends in IT service delivery related to Customer Services, System Services, Business Application Services, and IT Administration and Planning. We also received more detailed financial and IT labor data from six states, which we used for additional comparisons.

Trends in IT Service Delivery

Overall, the survey results indicate that **IT service delivery is either remaining as-is or is becoming more consolidated** in all but a handful of circumstances, as indicated in the chart below:



A central focus of this study surrounded the question: “Where is North Dakota on the decentralized-to-centralized continuum?” Overall, the survey indicated that:

- ◆ **North Dakota’s approach to Application Services is already more centralized than many states**
- ◆ **North Dakota’s approach to Systems Services is on par with survey averages**
- ◆ **Both Customer Service and IT Administration and Planning represent areas in which North Dakota is significantly less centralized than other states**

Chapter 2 presents additional supporting information for the above results.

Comparison of Financial and IT Labor Information

Initially, 13 states agreed to provide more detailed information for benchmarking purposes. Ultimately, we received data from the executive branches of six entities. Based on the limited data received, most IT staffing and spending measures ranked North Dakota higher than the other respondents. Please refer to Chapter 2 and Appendix C for more detail. Additionally, it is worth noting that the preponderance of the non-responding states simply were unable to provide the requested information and, correspondingly, could not participate. This represents a finding in itself.

2. IT GOVERNANCE

From a state-wide perspective, Pacific Technologies found that IT governance processes are just beginning to emerge. Recent legislation created the State Information Technology Advisory Committee, and chartered that group to prioritize the State's major IT projects. **SITAC is now developing the methods and tools to accomplish this – and these efforts appear to be on-track.**

At the agency level, we found tremendous variation in formality of IT governance processes. Some agencies have highly-structured approaches that align IT investments with business priorities. Others take less formal routes. All agencies submit IT plans, however most view this as an exercise focused primarily on budget preparation rather than development of strategic IT direction for the agencies.

Three specific areas of IT governance concern surround:

- ◆ **The lack of standard processes and tools for project evaluation** – a factor that contributes to the fragmentation of the State's application architecture and creates a barrier to managing the State's application investments from a portfolio view
- ◆ **Inconsistent performance measures for IT projects** – making it difficult to quantify the value received for technology-related investments
- ◆ **Insufficient IT management and performance reporting mechanisms for the Legislature** – impacting the State's efforts to make informed IT decisions

D. KEY RECOMMENDATIONS

This study identifies four major recommendations:

- ◆ **Consolidate Desktop Services within ITD**
- ◆ **Standardize workstations across the State**
- ◆ **Continue to consolidate servers and server administration in ITD**
- ◆ **Improve IT governance processes**

It bears repeating that the strategic IT goals outlined in the introduction of this report served as the guiding force for these recommendations – rather than a sole concentration on cost reduction. In addition, please note that projections of potential labor savings represent estimates derived from a staffing matrix populated by agency personnel. The stated figures represent approximations that most likely will need to be adjusted as implementation proceeds.

Separating operational practice from analytical theory, Pacific Technologies believes that it is unrealistic to expect that the full amount of the potential savings will be achieved in the form of dollars returned to the State's budget. In particular, partial-FTE labor savings will likely be realized as additional productive labor available to the agencies. In addition, these savings will be off-set by some start-up costs and associated ongoing costs. The table at the conclusion of this section summarizes these projections.

These recommendations apply across the State to the Executive, Legislative, and Judicial branches of government. While such an approach has the potential to yield the greatest overall efficiency improvements and possible cost savings for the State, it has raised policy issues regarding separation of powers for some.

As a recommendation, this is not precedent setting – several other states have some aspect of IT service delivery to judicial and legislative branches provided by an executive based IT agency. Indeed, North Dakota already has such an arrangement for networking service provision with StageNet, and will also have all three branches served by ConnectND. What's more, this recommendation focuses on consolidating and streamlining infrastructure support – branch and agency application development,

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support, and maintenance remain outside the control of ITD. Nevertheless, the implementation needs to provide mechanisms through which the impacted parties can:

- ◆ Effectively elevate service delivery problems and issues for prompt resolution
- ◆ Resume provision of their own IT services if ITD proves unable to meet agency needs

The remainder of this section briefly describes each recommendation.

CONSOLIDATE DESKTOP SERVICES WITHIN ITD

Pacific Technologies recommends that the State consolidate all workstation support and associated help desk labor in ITD, including responsibility for:

- ◆ Initial problem reporting and resolution
- ◆ Maintenance and support of the State's personal computers, personal productivity software (e.g., Microsoft Office), network applications (e.g., calendaring, email, etc.), and related peripherals
- ◆ Adds, moves, and changes
- ◆ Managing the associated hardware replacement
- ◆ Tracking the associated performance measures

Major benefits:

- ◆ *Consistency of service and potential for improved service levels*
- ◆ *Greater specialization of IT skill sets, removing small fractional FTE labor efforts from many agencies*
- ◆ *Removes IT infrastructure responsibilities from the agencies, allowing them to concentrate resources on business operations*
- ◆ *Positions the State for provision of IT services as a utility*
- ◆ *Potential labor savings of up to \$519,000 per year*

Note that the potential savings assume a significant productivity increase as a result of the centralization and improvements to the State's desktop environment and associated management tools. The saving projections are based on a ratio of approximately 200 workstations per support FTE, in contrast to the State's current ratio of approximately 149:1. In practice, the State's ability to capture the full amount of the savings will depend upon several key factors:

- ◆ How aggressively the State pursues incremental labor savings associated with removing this labor effort from the small and mid-size agencies
- ◆ How successful ITD is at delivering high-quality service
- ◆ The State's success at standardizing its desktops
- ◆ How many exceptions the State grants that allow agencies to continue providing their own support
- ◆ How efficiently the State can provide service to sites outside of Bismarck – accounting for over one-fifth of the State's workstations

Also note that the projected savings do not include reductions in agency IT management labor. It is likely that some savings will also be realized in this area.

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STANDARDIZE WORKSTATIONS ACROSS THE STATE

Pacific Technologies recommends that the State move to a highly-standardized workstation environment, limiting the brands and models of workstations installed and tightly controlling the associated configurations.

We recommend making no more than two or three hardware options available, and that the agencies select either a three- or four-year replacement cycle for each machine. We also recommend that ITD manage the replacement cycle, including collecting the necessary funds from the agencies through workstation charges, procuring, configuring, and installing the workstations.

This recommendation is critical to the State's ability to achieve the productivity increase assumed in the consolidation of Desktop Services, as it will greatly reduce the workload associated with desktop support.

Major benefits:

- ◆ **A key component of the State's move to *providing basic IT services as a utility***
- ◆ ***Reduced support costs* as workstation services staff can more effectively and efficiently implement, manage, and troubleshoot a simple environment – thereby requiring fewer FTEs**
- ◆ ***Reduced training costs* through limiting the number of technology skills support staff and users must possess**
- ◆ ***Reduced workstation costs* through economies of scale in purchasing**
- ◆ ***Opportunities for license savings* through economies of scale in purchasing, particularly via the ability to better identify and utilize site licensing opportunities**
- ◆ ***Opportunities for outsourcing* will be potentially cost-effective only in a standardized environment**

The State was unable to provide Pacific Technologies with a figure that represents current spending for workstation replacement. **Nevertheless, we believe agency budgets will likely need to be increased to allow for more frequent workstation upgrades.**

Assuming an average workstation cost ranging between \$1,100 and over \$1,400 per workstation (including workstation, personal productivity software, and monitor) and an average replacement cycle of slightly over three years, this recommendation will cost between \$3 million and \$3.7 million per year. With an inventory of approximately 7,700 workstations, the monthly per-workstation charge would range from \$32 to \$40. *The exact configuration options and agency choices will significantly impact the actual cost of this recommendation.*

It is worth noting that several “non-networked” and “non-desktop” computing devices (such as personal digital assistants (PDAs), standalone laptops, etc.) are not included in our analysis and recommendations surrounding workstation standardization and consolidated support.

CONTINUE TO CONSOLIDATE SERVERS AND SERVER ADMINISTRATION IN ITD

We estimate annual labor cost savings of \$294K from the first stage of server consolidation accomplished via HB 1505. Our analysis shows that up to \$162K of potential additional annual labor savings is available through continued consolidation efforts, building to that number over the next several years.

To accomplish this, we recommend that ITD:

- ◆ Assume responsibility for hosting and administering the remaining servers still under agency control, based on a consolidation schedule developed in partnership with the affected areas
- ◆ Reduce the total number of servers through aggressive consolidation of similar platforms and sharing applications on servers where possible

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- ◆ Reduce staff as needed to keep a ratio of approximately 29 servers per administrator
- ◆ Establish related performance measures

Major benefits:

- ◆ **In combination with the Desktop Services consolidation, removes IT infrastructure responsibilities from the agencies, allowing them to *concentrate resources on business operations***
- ◆ **Positions the State for *provision of IT services as a utility***
- ◆ ***Greater specialization of IT skill sets, removing small fractional FTE labor efforts from many agencies***
- ◆ **Improves the State's *ability to manage IT security***
- ◆ ***Enhanced service consistency and potential for improved service levels***
- ◆ **Potential labor *savings of up to \$162,000 per year***
- ◆ **Potential additional hardware cost savings due to a reduction in the number of installed servers**

Note that the calculated savings assume a consolidation of all servers into ITD and a related reduction of approximately 150 servers from the State's inventory. Corresponding reductions to both agency and ITD server administration labor would occur. Similar to Desktop Services consolidation efforts, the State's ability to capture the full amount of the savings will depend upon:

- ◆ How aggressively the State pursues incremental labor savings associated with removing this labor effort from the small and mid-size agencies
- ◆ How successful ITD is at delivering high-quality service
- ◆ The State's success at consolidating the servers into ITD and reducing the total server inventory
- ◆ How amenable the servers are to standardization—highly standardized servers for email and file/print services may allow further improvements in labor efficiency; a large variety of unique configurations may require labor beyond the projections presented here

Please note that estimated savings do not include recurring hardware savings associated with reducing the number of servers currently in operation. Additionally, projected savings do not count reductions in agency IT labor related to security administration, storage management, or database administration, or IT management activities. It is likely that some economies of scale would also be realized in these areas.

IMPROVE IT GOVERNANCE PROCESSES

Pacific Technologies recommends that the State build on existing IT governance processes by:

- ◆ Improving the processes and tools for IT project evaluation
- ◆ Improving mechanisms to support cost containment
- ◆ Developing meaningful state-wide management and reporting views of IT initiatives
- ◆ Implementing IT performance measures
- ◆ Establishing an IT innovation fund

Section E of Chapter 3 provides more detailed descriptions of our recommended process adjustments, including related roles and responsibilities. It also contains suggested contents for a standard business case that will help the State consistently evaluate IT projects, as well as recommendations regarding an IT "report card" and related performance measures.

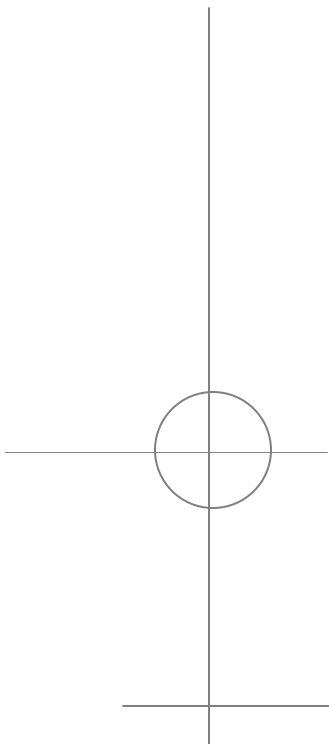
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Major benefits:

- ◆ Better-informed IT decision-making
- ◆ A consistent, structured, business-based approach for evaluating IT initiatives
- ◆ Provides a mechanism for managing application portfolio costs
- ◆ Enhanced communication around major IT initiatives

The following exhibit highlights estimated costs and potential savings associated with each recommended initiative. Refer to Chapter 3, section H for additional detail.



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Summary of Estimated Costs and Savings

Consolidate Provision of Desktop Services

Potential Annual Labor Savings:	\$519,000
Recurring annual expenditures for related goods and services estimated at:	\$60,000-\$260,000
One-time costs for software, hardware, phone systems, etc. estimated at:	\$160,000-\$1,010,000
<ul style="list-style-type: none"> ◆ Yields a net potential annual savings of \$259,000 to \$459,000 – depending upon the magnitude of the recurring costs and on how aggressively the State pursues reductions. ◆ The low-end estimate includes one-time costs of \$100,000 for phone system upgrades, along with some monies for procurement assistance and training. Associated recurring costs are likely to be at the upper-end of the range, as the State might have to lease help desk and remote management software. ◆ The high-end estimate includes system management software costs of \$360,000, phone system upgrades for \$150,000, and monies for software implementation assistance, training, and procurement. Software maintenance would make up the lion's share of the recurring costs. 	

Standardize Workstations

Potential Annual Savings:	Unknown
Recurring annual expenditures for workstation replacement estimated at:	\$2,950,000-\$3,680,000
One-time costs for consulting assistance estimated at:	\$20,000-\$430,000
<ul style="list-style-type: none"> ◆ Current annual workstation replacement spending is not known, so incremental investment over today's expenditures could not be calculated. Replacement costs presented are based on conservative estimates and may be lower than indicated. ◆ Assumptions include a total PC count for the State of 7,700. Replacement costs for PCs used in our estimates are \$750, \$1200, or \$2,500. Assumed refresh interval is a little over three years. ◆ The low-end workstation replacement figure assumes 25% are low-cost, 70% are mid-level, and 5% are high-end; while the upper end assumes 5% low-cost, 75% mid-level, and 20% high-end. ◆ One-time cost range assumes varying levels of outside assistance with workstation standards. 	

Continue Server Consolidation

Potential Annual Labor Savings:	\$162,000
One-time costs for consulting assistance estimated at:	\$0-\$20,000
<ul style="list-style-type: none"> ◆ Savings are predicated on how aggressively the State pursues reductions. Savings do not include anticipated hardware savings related to a reduction in total servers. ◆ Upper end of one-time cost assumes some consulting assistance in developing a consolidation approach and schedule. 	

Implement IT Governance Recommendations

Potential Annual Savings:	Unknown
Recurring annual expenditures for goods, services, and innovation funding:	\$200,000-\$340,000
One-time costs for software and services estimated at:	\$480,000-\$1,010,000
<ul style="list-style-type: none"> ◆ Savings are largely dependent upon the State's focus on cost containment. ◆ Low-end of one-time estimate assumes purchase of less expensive portfolio management software and little assistance with implementing the software or the governance recommendations. ◆ Recurring cost estimate reflects a potential range of software maintenance fees and innovation funding of \$137,000 at the low end and \$275,000 at the upper end. 	

E. TRANSITION AND IMPLEMENTATION PLANS

This section outlines the major transition and implementation activities that will be required to actualize each of the study's key recommendations.

CONSOLIDATE PROVISION OF DESKTOP SERVICES WITHIN ITD

We recommend funding these services on a cost-recovery basis, in line with current ITD practices. Customer service targets must be clearly defined, monitored, and managed. ITD will need to develop estimated workstation rates and per-agency charges. The agencies, in turn, must determine the requisite budget reductions to pay the charges.

Our implementation plan asks the state to consider outsourcing as an alternative, although preliminary pricing seemed quite high. If the service is to be delivered in-house, ITD would need to post new position openings, with preferential treatment made for staff reduced from the agencies' workforce. Along the same lines, we envision additional one-time costs related to hiring new staff, setting up the Desktop Services facility, and implementing necessary support tools. These costs should be incorporated in the rate structure and amortized over the first two or three years. As performance improves over time, rate reductions might be possible due to increased service efficiency.

STANDARDIZE WORKSTATIONS ACROSS THE STATE

Because we do not know the status of the current PC inventory or existing replacement expenditures and plans, we cannot recommend the best start-up approach (i.e., wholesale replacement or replacement through attrition). Similar to the previous initiative, our implementation plan asks the State to study the best sourcing alternative. Regardless, it is almost a certainty that budgets will need to increase. This initiative represents a major shift in the desktop funding for the agencies. Rather than a one-time expenditure, PCs will become standard items with a monthly charge. The Legislature may need to provide monetary assistance to some agencies in making the transition to this new funding model. Once accomplished, agencies should be expected and able to budget for PC expenditures in a planned and consistent manner.

CONTINUE SERVER CONSOLIDATION

Post HB 1505, only a few agencies remain where server support levels are a concern. For these agencies, replacement cycle timing will serve as the primary driver for centralization. ITD must work cooperatively with the agencies to identify the specific schedule for these transitions. The affected agencies can then plan for and, where appropriate, make associated staff reductions. As ITD reduces the total server inventory, the agency should be able to lower rates based on related staff reductions and smaller equipment replacement costs.

IMPROVE IT GOVERNANCE PROCESSES

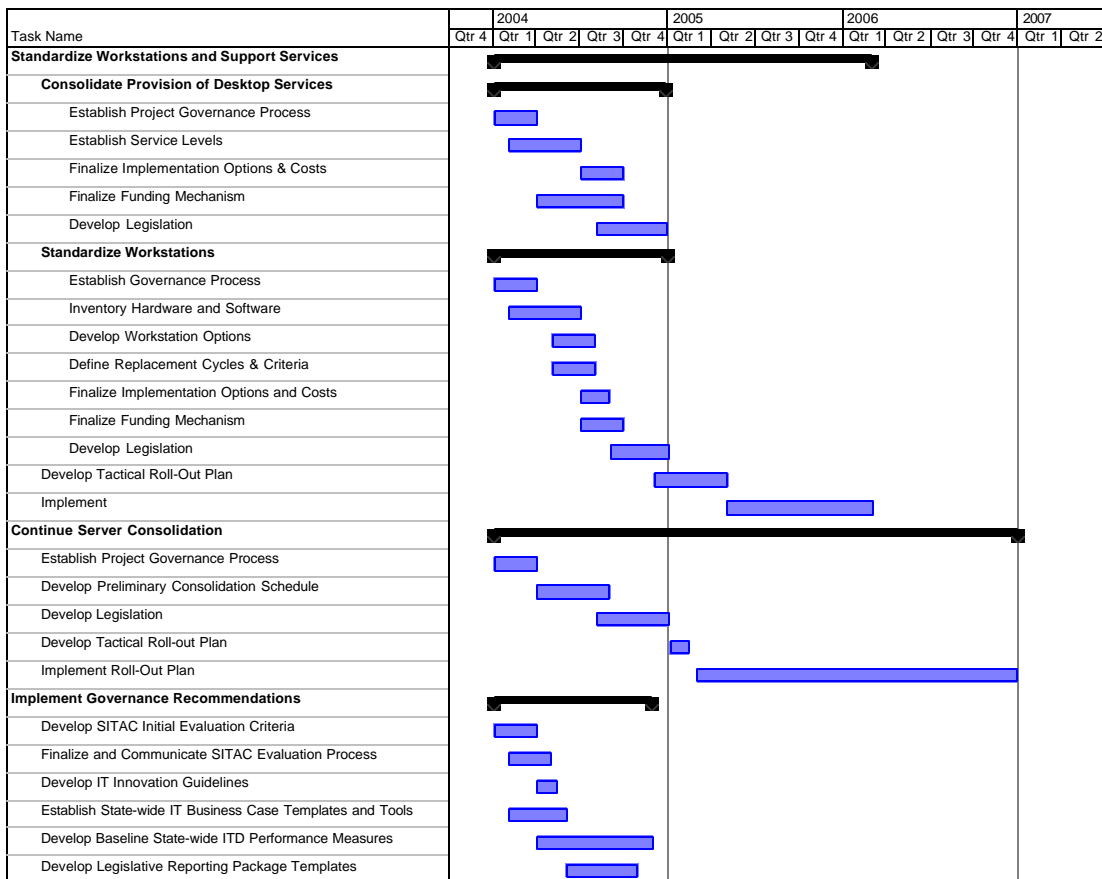
The transition and implementation activities surrounding this recommendation build upon and integrate many sound practices already in place at the State. Primary future efforts must focus on establishing more formal and consistent SITAC evaluation criteria (an activity already underway), guidelines and funding mechanisms for innovation, a state-wide business case template and tools, and meaningful management reports. With respect to the last item, the State will need to baseline a core set of key IT performance indicators and develop associated reporting views of those measures for presentation to the Legislature on a periodic basis (e.g., quarterly or semi-annually).

The following Gantt chart presents a suggested implementation schedule for the activities outlined above. The State will need to refine the overall timeline predicated on more in-depth analysis, other State initiatives, and resource constraints.

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Chapter 1: Executive Overview

Recommended Project Schedule



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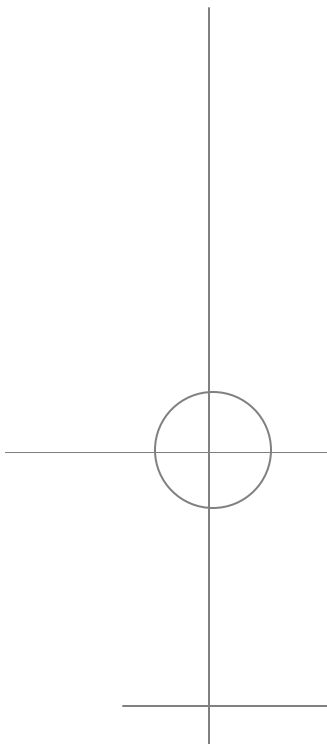
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F. CONCLUSION

Earlier in this executive overview, we presented several core IT goals for the State that focus on providing basic IT services as a state-wide “utility,” performance managing IT, adopting best practices, and favoring long-term improvement over short-term considerations. To put it another way, while cost-savings and efficiency improvements are the ultimate goal, short-term investments will be required to reap any long-term benefit. By implementing the strategic recommendations outlined in this report, the State can expect to make demonstrable progress toward that end. In fact, our recommendations will fundamentally shift the dynamics of IT service delivery in North Dakota. At a basic level, our work transitions IT infrastructure responsibilities out of the agencies and re-focuses their IT efforts on business applications – where they receive the largest return on their investment.

In many respects, however, this study represents the “easy part.” The real work lies ahead: translating these recommendations into *results*. Beyond making staff allocation changes and developing better management tools, these recommendations point toward a significant culture shift – moving to a performance managed environment. This is not a trivial task.

To successfully move forward and realize the benefits of these projects, the State must make a commitment to change – to build upon its successes, learn from its mistakes, and work cooperatively toward becoming more efficient and effective than ever before in its delivery and management of information technology. **This effort ultimately belongs to the State; it will require the active involvement of legislators, management, and staff to see these initiatives to their fruition.**



CHAPTER

2



findings

A. INTRODUCTION

This chapter provides Pacific Technologies' findings regarding IT service delivery, organization, and management at the State of North Dakota. Pacific Technologies developed these findings based on data gathered from State documents, a staffing model completed by agency personnel, interviews with representatives from over 35 state agencies and several members of the Interim Information Technology Committee of the Legislative Council, and phone surveys with IT representatives from 31 other states.

The remainder of this chapter presents our findings, organized as follows:

- B. IT Organization & Service Delivery
- C. IT Governance
- D. Additional Findings
- E. Survey Results
- F. Review of State-wide Initiatives

B. IT ORGANIZATION & SERVICE DELIVERY

This section summarizes the current approach for delivering IT services to state agencies, and provides an overview of the associated ITD and agency IT labor costs. It concludes by discussing service quality, noting recent IT cost-saving accomplishments, and identifying major IT service areas where additional cost savings may be achieved.

Appendix B presents a detailed staffing matrix for each State agency participating in this effort, along with additional analysis.

1. OVERVIEW

The State presently uses a mixture of centralized IT services provided by ITD and distributed IT services provided by the agencies. ITD operates on a cost recovery basis for its services. These costs are recovered through several mechanisms:

- ◆ Usage charges – such as mainframe CPU seconds consumed, pages printed, disk storage utilized, etc.
- ◆ Flat fees – such as device charges, application hosting charges, web hosting charges, etc.
- ◆ Hourly charges – for services such as programming, database administration, etc.
- ◆ Actual cost plus administrative overhead – for costs not otherwise recovered

During the budget cycle, ITD works closely with the Office of Management and Budget (OMB) and the agencies to estimate centralized IT needs and costs over the next biennium so that the agencies can include ITD charges in their budget requests. The agencies also estimate costs for IT services not provided by ITD to include in their budget requests.

In these times of spending cutbacks, both distributed and centralized IT expenditures have come under scrutiny. Our analysis of the State's IT operating spending shows that labor accounts for about half the annual total. Accordingly, if reductions must occur, IT labor presents a logical target for potential cost savings.

These cost reductions might take one of several forms:

- ◆ ITD could improve its service efficiency enough to reduce staff, thereby lowering costs and ultimately the rates charged to the agencies

- ◆ Agencies could similarly improve their own IT service efficiency enough to reduce staff and reap the cost savings directly
- ◆ For services which could be more efficiently provided centrally, agencies could utilize ITD, more than offsetting the increased ITD charges by reductions in their own staff costs
- ◆ ITD and the agencies could outsource certain IT functions if this delivered lower total costs and/or reduced demand for a particular service

The next subsection highlights current labor costs for ITD and agency IT services.

2. CURRENT IT LABOR COST

We asked each North Dakota state agency to fill out an IT staffing matrix. The model captured time spent on 26 specific functions, intended to represent all IT labor effort at the State. Agency responses included full- and part-time IT staff, contractors, and any non-IT-titled “shadow staff” (i.e., individuals without IT job titles who spend more than 10% of their time on IT support). **Note that all of this effort was incorporated into our presentation of FTE allocations.**

Responses also included annual salary plus benefits for each staff member – as reported by the agencies – and annual costs for contractors. This allows us to analyze labor cost per function from a variety of perspectives.

Of the 52 agencies contacted, we received 40 responses. The non-responding agencies were small and represent no more than 350 total FTE, so their absence from the analysis does not have a material impact on the results. Overall costs shown in this section would likely be about 3% higher had all agencies responded.

The subsections below present an analysis of the State’s IT labor costs as follows:

- ◆ Overall Cost
- ◆ Cost by Service
- ◆ Server Provider Comparison

OVERALL COST

Our analysis indicates that the State’s overall annual IT labor cost is \$26.9 million. This is split almost evenly between ITD at \$13.1 million and the agencies at \$13.8 million.

To facilitate our analysis and enhance our ability to compare North Dakota’s IT labor with other states, we grouped the 26 individual IT activities into four functional areas:

- ◆ **Customer Services** – those functions related to directly supporting users of IT systems and services
- ◆ **System Services** – those functions related to implementing, maintaining, and supporting the organization’s computers, systems software, and connectivity
- ◆ **Business Application Services** – those functions related to providing, maintaining, and supporting the use of software needed to meet the operational, management, and reporting requirements of the organization
- ◆ **IT Administration and Planning** – those functions related to the planning, oversight, security, and day-to-day operations of the technology function at the organization

The following chart summarizes the State’s IT labor costs by these areas. As the chart clearly shows:

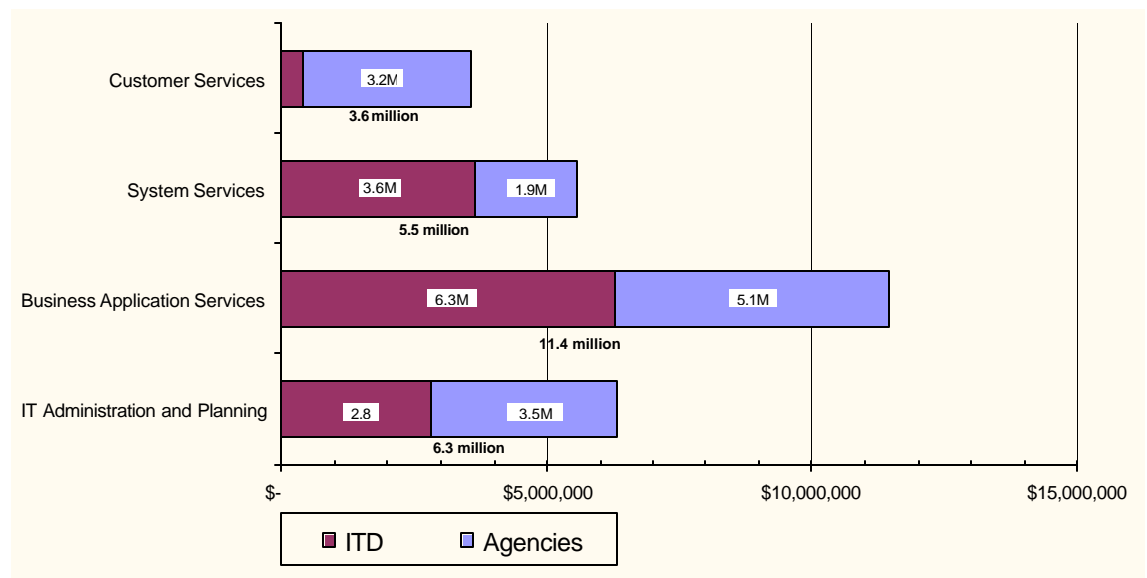
- ◆ Customer Services are mostly distributed
- ◆ System Services are mostly consolidated

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- ◆ Business Application and IT Administration and Planning services are mixed
- ◆ Business Application support represents the largest IT labor cost

OVERALL IT LABOR COSTS BY FUNCTIONAL AREA



COSTS BY SERVICE

The following table summarizes the total labor effort (including contractors and “shadow” staff) and cost for each IT service. *Appendix B presents a similar table for each state agency.*

IT STAFFING LEVELS AND COST BY SERVICE

IT Functions		ITD FTE	ITD Cost	ITD cost per FTE	Agency FTE	Agency Cost	TOTAL FTE	TOTAL Cost
Customer Services								
Desktop Services	Help Desk (Tier 1)	4.20	\$ 236,600	\$ 56,333	17.87	\$ 855,359	22.07	\$ 1,091,959
	Workstation support (Tier 2)	1.80	\$ 108,000	\$ 60,000	20.03	\$ 937,790	21.83	\$ 1,045,790
	End user application support	0.40	\$ 24,750	\$ 61,875	24.27	\$ 1,134,810	24.67	\$ 1,159,560
	Training	0.70	\$ 41,400	\$ 59,143	5.19	\$ 260,981	5.89	\$ 302,381
System Services								
Server Administration	Network connectivity (WAN/LAN/wireless)	17.90	\$ 1,109,500	\$ 61,983	1.81	\$ 104,666	19.71	\$ 1,214,166
	Email administration	2.30	\$ 157,600	\$ 68,522	0.50	\$ 26,704	2.80	\$ 184,304
	File/print administration	1.50	\$ 91,500	\$ 61,000	1.99	\$ 101,702	3.49	\$ 193,202
	Other server administration	7.45	\$ 492,875	\$ 66,158	1.86	\$ 100,089	9.31	\$ 592,964
Desktop Services	Workstation administration	0.30	\$ 18,200	\$ 60,667	7.37	\$ 350,830	7.67	\$ 369,030
	Storage management	1.90	\$ 148,000	\$ 77,895	0.91	\$ 52,302	2.81	\$ 200,302
	Data center operations	14.30	\$ 731,900	\$ 51,182	7.46	\$ 396,827	21.76	\$ 1,128,727
	Database administration	6.00	\$ 418,500	\$ 69,750	5.51	\$ 337,339	11.51	\$ 755,839
	Security administration	3.00	\$ 213,500	\$ 71,167	3.16	\$ 190,567	6.16	\$ 404,067
	Telephone systems support	4.70	\$ 244,200	\$ 51,957	2.66	\$ 119,018	7.36	\$ 363,218
	Business Application Services							
	- Finance	4.36	\$ 270,335	\$ 62,003	4.01	\$ 233,648	8.37	\$ 503,983
Desktop Services	- Payroll	4.06	\$ 251,935	\$ 62,053	2.75	\$ 132,619	6.81	\$ 384,554
	- HR	2.08	\$ 132,230	\$ 63,572	2.12	\$ 145,721	4.20	\$ 277,951
	Agency applications	90.25	\$ 5,624,325	\$ 62,319	82.06	\$ 4,686,225	172.31	\$ 10,310,550
IT Administration and Planning								
Desktop Services	Strategic planning	6.10	\$ 540,250	\$ 88,566	7.36	\$ 508,708	13.46	\$ 1,048,958
	Research and development	2.30	\$ 183,150	\$ 79,630	4.41	\$ 256,515	6.71	\$ 439,665
	Disaster recovery management	1.10	\$ 76,800	\$ 69,818	2.32	\$ 150,652	3.42	\$ 227,452
	Asset management	0.70	\$ 42,700	\$ 61,000	2.29	\$ 122,117	2.99	\$ 164,817
	IT procurement	0.80	\$ 47,700	\$ 59,625	3.89	\$ 222,907	4.69	\$ 270,607
	Project management	9.70	\$ 739,900	\$ 76,278	17.80	\$ 1,279,076	27.50	\$ 2,018,976
	Administrative support	7.90	\$ 446,900	\$ 56,570	5.69	\$ 236,536	13.59	\$ 683,436
	Departmental management	9.40	\$ 740,850	\$ 78,814	10.41	\$ 757,900	19.81	\$ 1,498,750
TOTAL		205.20	\$ 13,133,600		245.69	\$ 13,701,606	450.89	\$ 26,835,206

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The callout boxes above indicate the IT services required for Desktop Services and Server Administration. This allows us to compute PC-to-support staff and server-to-support staff ratios. The table below presents these metrics for the State of North Dakota. Refer to Section D in this chapter for additional detail.

DESKTOP SERVICES & SERVER ADMINISTRATION IT SUPPORT STAFF RATIOS

Support FTE's		Support Ratios per FTE
51.57	No. Workstations	7,674
15.60	No. Servers	503
		149 to 1
		32 to 1

Overall, these ratios indicate a reasonable degree of efficiency and are in line with our experience for public sector IT support services.

SERVICE PROVIDER COMPARISON

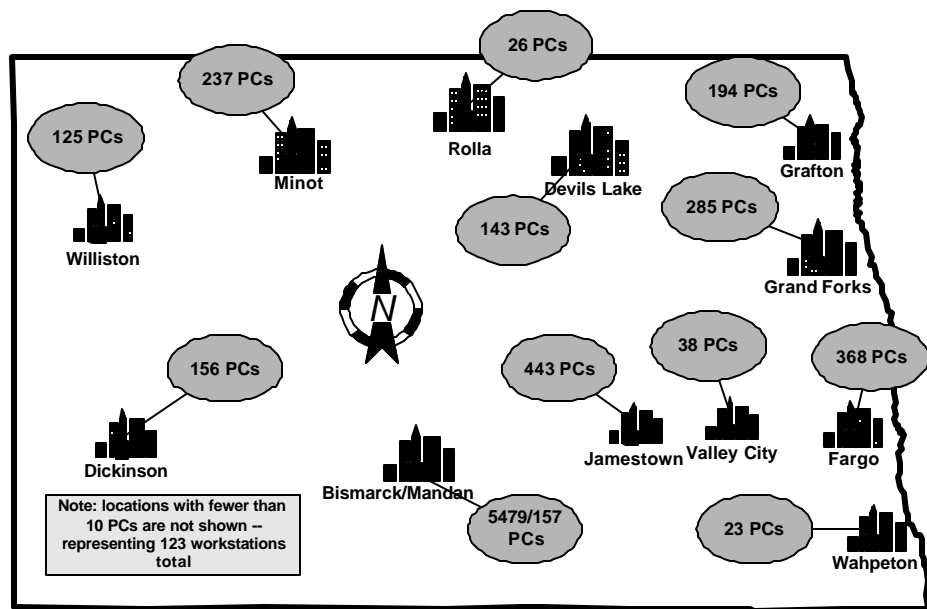
This subsection takes a more detailed look at some key IT services, comparing agency and ITD staffing and costs. Please see Appendix B for additional analysis of mainframe hosting, disaster recovery management, storage management, and state-wide applications.

The following table provides more detail regarding the distribution of labor between the agencies and ITD for server and desktop support services. It shows that Desktop Services are largely an agency responsibility, while server support has shifted mostly to ITD following the implementation of HB1505.

IT SUPPORT STAFF DISTRIBUTION

	ITD Staff		Agency Staff		TOTALS	
	FTE's	Dollars	FTE's	Dollars	FTE's	Dollars
Desktop Services	6.30	\$ 362,800	45.27	\$ 2,143,979	51.57	\$ 2,506,779
Server Support	11.25	\$ 741,975	4.45	\$ 233,870	15.70	\$ 975,845

The exhibit below shows the geographic distribution of the State's workstations. Note that approximately 73% of the workstations are in the Bismarck/Mandan area. Please see Appendix B for agency detail about workstations located outside Bismarck.



	Count	% of Total
Total Bismarck/Mandan:	5636	73%
Total Other:	2038	27%
Total Workstations:	7674	100%

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HB1505 IMPACT

The table below analyzes the impact of HB1505 on server support staffing levels and costs. It leads us to conclude that:

- ◆ There are still about 45 servers in the non-consolidated agencies
- ◆ Some opportunities for savings through consolidation still exist at the seven agencies with negotiated exemptions from HB1505
- ◆ For the eight agencies successfully consolidated, very few servers remain and total costs are small
- ◆ Annual labor savings from consolidation are significant, but will provide only about 42% of the \$700,000 in annual cost reductions mandated by HB1505

SERVER ADMINISTRATION STAFFING AND COSTS

Agency	Number of Servers	Server Administration FTE	Servers per FTE	Server Administration Labor Cost	Server Administration Unit Cost	Labor Cost per Server
Agencies Exempt from HB 1505:						
Judicial Branch	26	0.61	43	\$34,486	\$56,535	\$1,326
Attorney General	4	0.33	12	\$15,630	\$47,362	\$3,907
20 small agencies (total)	15	0.96	16	\$50,092	\$52,343	\$3,339
7 negotiated exemptions (total)	42	1.86	23	\$97,898	\$52,634	\$ 2,331
Agencies Included in HB 1505:						
8 consolidated agencies (total)	7	0.59	12	\$30,388	\$51,505	\$ 4,341
Information Technology Department	409	11.25	36	\$741,975	\$ 65,953	\$ 1,814
TOTAL (post-consolidation)	503	15.60	32	\$ 970,470	\$ 62,222	\$ 1,929
TOTALS: 15 agencies pre-consolidation	202	11.63	17	\$619,228	\$ 53,244	\$ 3,065

15 HB 1505 agencies' server administration labor cost pre-consolidation	\$619,228
15 agencies' server administration labor cost post-consolidation	\$128,287
ITD additional server administration labor post-consolidation	\$196,500
Total ITD and 15 agencies' server administration post-consolidation	\$324,787
Annual labor savings from server consolidation	\$294,442
Percent of HB1505 mandated annual cost reduction	42%

The final table below presents agency cost and staffing data for application development and maintenance.

AGENCY APPLICATION STAFFING AND COSTS			
Agency	Agency Applications		
	Agency FTE	Agency labor cost	Cost per FTE
Parks and Recreation	0.25	\$12,019	\$48,075
Department of Commerce	0.26	\$20,154	\$77,515
Insurance Commissioner	0.35	\$15,050	\$43,000
Department of Corrections	0.35	\$38,401	\$109,717
Mill and Elevator	0.40	\$29,460	\$73,650
Water Commission	0.50	\$30,383	\$60,766
Council on the Arts	0.65	\$16,639	\$25,598
Land Department	0.70	\$25,176	\$35,965
Housing Finance Agency	0.75	\$44,583	\$59,444
Public Service Commission	0.80	\$44,211	\$55,263
Public Employees Retirement System	0.86	\$41,144	\$47,842
Industrial Commission	0.93	\$53,430	\$57,451
Subtotals for agencies with < 1 FTE	6.80	\$370,648	\$54,507
Highway Patrol	1.25	\$61,445	\$49,156
Retirement and Investment Office	1.55	\$79,260	\$51,136
Department of Health	1.59	\$88,700	\$55,786
Department of Human Services	2.30	\$117,378	\$51,034
Judicial Branch	2.44	\$131,731	\$53,988
Secretary of State	2.45	\$144,793	\$59,099
Legislative Council	2.60	\$273,805	\$105,490
Tax Department	3.47	\$174,412	\$50,331
Office of Management and Budget	3.65	\$205,278	\$56,223
Attorney General	3.95	\$182,187	\$46,123
Department of Public Instruction	4.00	\$295,592	\$73,898
Subtotals for agencies with 1 - 5 FTE	29.24	\$1,754,581	\$60,002
Job Service	8.59	\$490,954	\$57,154
Department of Transportation	9.30	\$524,497	\$56,398
Workforce Safety and Insurance	12.88	\$731,795	\$56,838
Bank of North Dakota	15.25	\$813,749	\$53,361
Subtotals for agencies with > 5 FTE	46.02	\$2,560,995	\$55,656
Information Technology Department	90.25	\$5,624,325	\$62,319
TOTAL	172.31	\$10,310,550	\$59,838

Note: ten agencies reported 0 FTE

To reiterate, the FTE count includes all State IT staff, IT contractors, and shadow staff, as reported by the agencies on the IT staffing matrix

From this table we conclude that:

- ◆ Agency application development and maintenance is about evenly split between ITD and the agencies
- ◆ ITD's per-FTE costs are somewhat higher than agency costs for this service
- ◆ The Legislative Council's reliance on contractors for application development makes their per-FTE cost high— this is also true of Department of Public Instruction (DPI), although to a lesser extent

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A key measure of staff allocation efficiency, developed by Pacific Technologies, is the **Cooks number** – from the old saying “Too many cooks spoil the broth.” This number counts the excess individuals beyond the FTE effort level required for a particular function. For example, an agency might have 5.5 FTE of server administration performed by 8 staff. This amount of service could be provided by as few as 6 individuals, so the Cooks number would be 2.

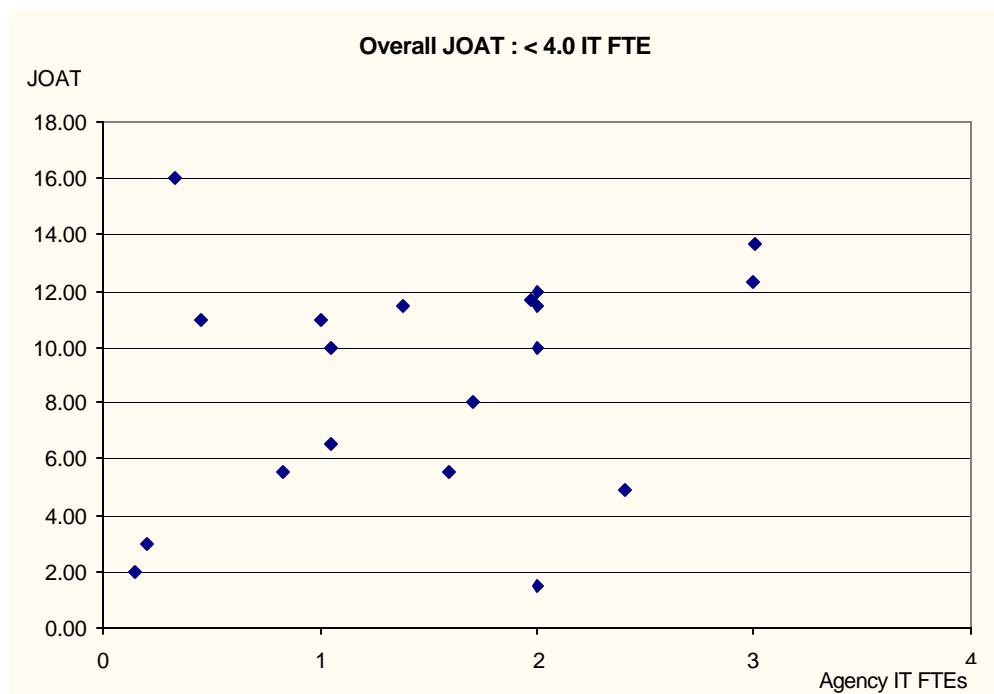
This number does not provide meaningful analysis for small agencies for several reasons. Primarily, there simply aren’t enough staff on hand for Cooks to be an issue – even if everyone in a small organization was contributing effort to a specific function. Additionally, small agencies often must rely on IT generalists for support, naturally increasing the number of IT staff that might be providing a specific function. Appendix B supplies this information for all of the agencies, and includes a summary analysis for those agencies where we have identified Cooks as a specific concern.

Several agencies showed high Cooks numbers for Desktop Services – leading to the conclusion that this key service might benefit from a reduction in the total number of individuals assigned to it.

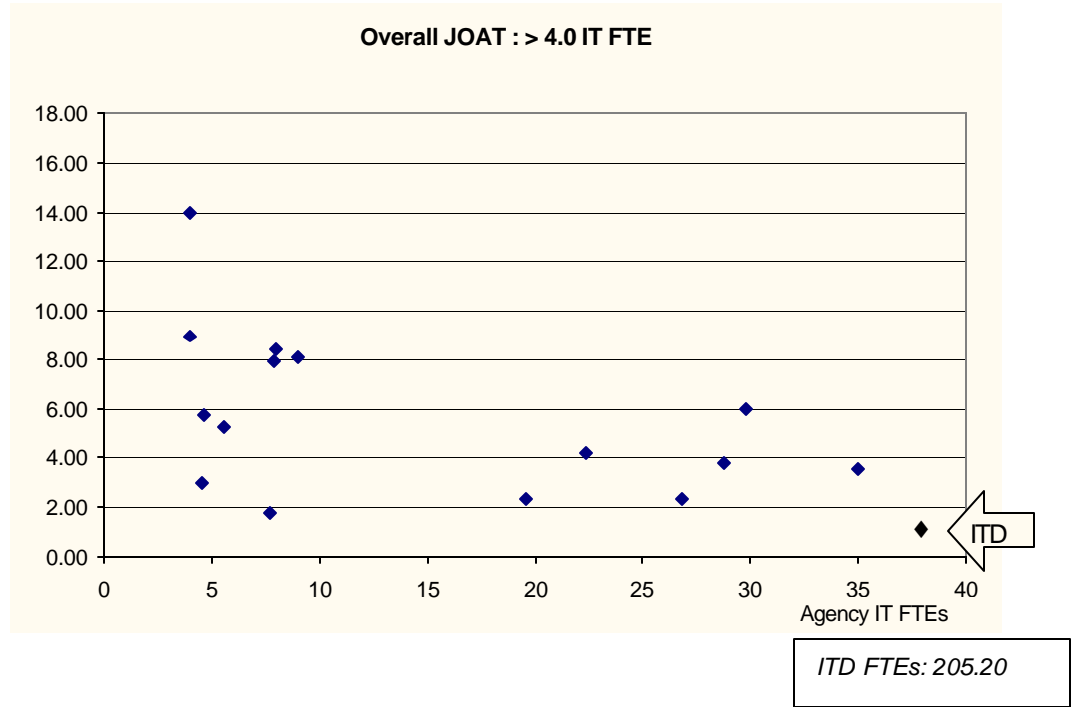
Another key Pacific Technologies-developed measure, the “Jack Of All Trades” (JOAT) factor, focuses on staff skill specialization. This counts the number of IT service functions performed by each individual – for instance, one person might perform e-mail administration, database administration, help desk, and project management; giving that individual a JOAT number of 4. The overall JOAT number for an agency is the average JOAT number for all of its staff. Simply, this number provides an indication of how many multiple IT service “hats” are worn by each individual within an organization, and highlights where greater levels of specialization may be warranted.

In our experience, small agencies often have high JOAT numbers, because they have only a few IT staff who are expected to act as IT generalists and perform many functions. This can be an effective way of staffing a small organization. But, when viewed at the enterprise-wide level for an organization the size of North Dakota, it is frequently accompanied by lower levels of service quality. It is difficult for one individual to be expert in multiple IT disciplines.

The chart below plots the overall JOAT numbers for agencies with less than 4 IT FTE. **North Dakota’s small agencies fall into two categories – those with high JOAT numbers and those that do not support a full set of IT services with their own staff.**



The next chart plots the overall JOAT numbers for agencies with great than 4 IT FTE. **Note the clear trend of decreasing JOAT as agency IT staff size increases.** The larger agencies have succeeded in making their IT staff concentrate on doing fewer things so they can do them better. **With an average JOAT of 1.64, ITD has achieved greater skill specialization than any of the agencies.** The State should be able to derive service quality improvements from taking advantage of ITD's ability to specialize – particularly for the smaller agencies.



3. SERVICE QUALITY

ITD's current focus is on application development and "back end" services such as WAN, data center operations, server hosting, etc. The success measures for these services tend to be either cost centered (i.e., project came in under budget) or technically oriented (e.g., server uptime, WAN bandwidth used, etc.). ITD tracks a number of performance measures related to these areas. ITD also has related performance targets associated with many of these measures, including percentage of strategic initiatives completed successfully (75%), percentage of reported problems resolved within the Support Center (75%), median time working hours required to resolve reported and assigned problems (2.25 hours), etc. While some adjustment to the measures and targets may be desirable, in general they are on the right track. **Performance, as reported in ITD's annual report, gives no indication of significant quality issues in the areas being tracked.**

Generally, the agencies are much less structured in their approach to measuring service quality. A small number of the larger agencies track problem resolution times for their Desktop Services, but quality measures such as number problems per workstation or cost-per-call are not collected. With a few exceptions, problem frequencies are not analyzed.

Anecdotally, our interviews indicated that agencies are very happy with their internal IT service. **Ultimately, Pacific Technologies had no quantitative data available to broadly assess the quality of IT service in the agencies. In addition, instituting the quantitative measurements necessary to provide metrics would require too much overhead for most agencies, given their small staff sizes.**

4. STRENGTHS

Our labor cost analysis highlighted several areas of strength worthy of note:

- ◆ **The State's workstation-to-support-staff ratio falls within acceptable ranges for government agencies.** We usually encounter ratios between 100 to 150 PC's per support staff FTE, and North Dakota falls within this at 149 PC's. *Note that in some highly-standardized environments we have seen support ratios reach 200 or more PC's per support FTE.*
- ◆ **Similarly, the State has achieved a good ratio of servers to support staff.** Our benchmark number in the public sector is 25 servers per support staff, which the state exceeds with a current level of 32 servers per support FTE. *Note that as servers are consolidated, staffing levels will need to come down to maintain a reasonable ratio.*
- ◆ **The State has chosen to devote significant resources to its application portfolio.** Ultimately this area is where the State can expect to see the most business benefits to the agencies. While our study did not review the business value of each component in the application portfolio, clearly the State should expect major productivity or service quality gains given the resources expended.
- ◆ **The recent server consolidation effort has saved the State money.** The changes reduced total labor devoted to server administration by approximately six FTEs, with additional savings expected as ITD reduces the number of servers.
- ◆ **Agencies generally report that they are happy with their IT services.** This is an indication that appropriate resources are being applied and that business units perceived value in their IT investments.

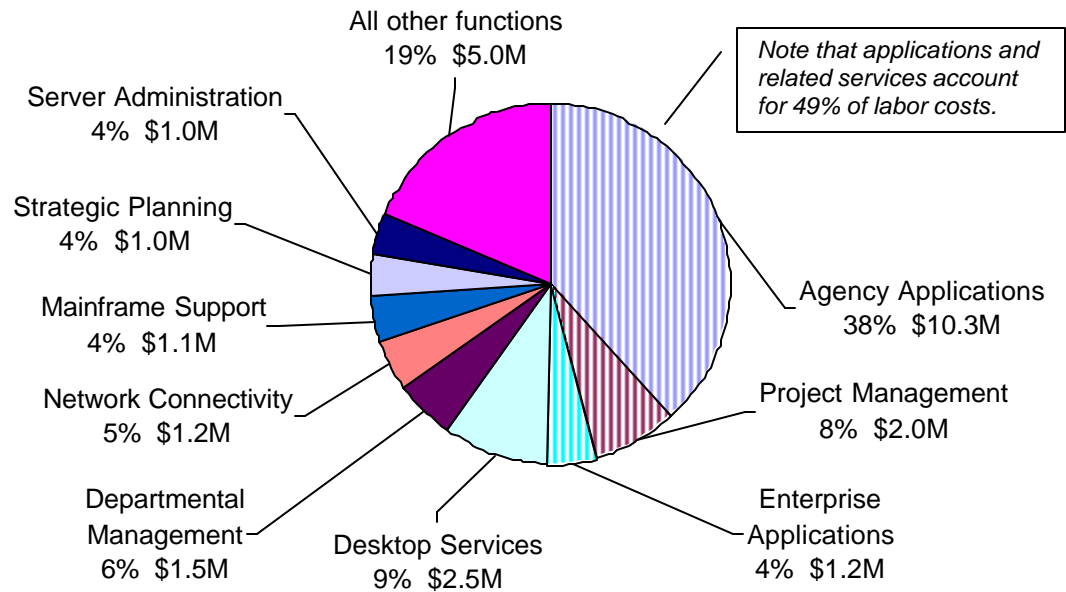
5. OPPORTUNITIES FOR IMPROVEMENT

We believe the following areas should be the State's focus as it strives to improve IT services:

- ◆ **Desktop Services** is the second-most costly IT service provided, and the one most broadly distributed across multiple staff. While overall efficiency is reasonable today, improvements in both cost and service quality can be realized.
- ◆ **Application support** is by far the largest single IT service. Quantifying the business value of the State's applications was outside the scope of our study – but, given the large sums involved, this area may be fertile ground for long-term cost reductions.
- ◆ **Server administration** has already seen cost savings as a result of HB1505. ITD believes (and we concur) that additional savings can be obtained over time through reductions in the number of servers. There are also additional opportunities to move servers from the agencies to ITD.
- ◆ **Large agencies with "Cooks" issues** can look for ways to reduce the number of individuals performing certain IT services. Approaches might include reassignment of duties, outsourcing, and shifting workload to ITD.
- ◆ **Small agencies with "JOAT" problems** may find their limited staff resources would be better concentrated on doing a few tasks well. Potential approaches to this would also include outsourcing and shifting workload to ITD.

The chart on the following page summarizes the "Top 10" IT service areas by labor cost. Note that these constitute more than 80% of the State's \$26.9M in IT labor costs. As the State looks for further cost reductions in IT service delivery, these should serve as a guide to where the biggest opportunities may exist.

IT SERVICE LABOR COST RANKINGS



C. IT GOVERNANCE

IT governance includes all aspects of technology-related decision making, including processes, tools, roles and responsibilities, and related standards and policies. Pacific Technologies conducted an analysis of the State's IT governance approach – focusing primarily on investment-related decisions – by distilling data gathered through our interview and document review processes. We also evaluated these practices in light of information received through our nation-wide survey. This section presents our findings, organized as follows:

1. Current Approach
2. Strengths and Opportunities for Improvement

1. CURRENT APPROACH

The State's approach to IT decision making is in the midst of significant change. This analysis examines existing processes as well as recent examples of major IT decisions. To the degree possible, we note areas where consequential adjustments are in progress or are expected in the near future.

STATE-WIDE

State-wide IT decision-making processes are currently going through substantial revision. Previously, IT governance at this level was conducted on an ad-hoc basis, typically being created to meet the specific requirements of a project (e.g., ConnectND) and relying heavily on existing non-IT-specific processes. While the State has effectively made IT decisions using this approach, it has not provided a mechanism for taking a state-wide view of IT. Recent legislation has attempted to address this by making ITD responsible for reviewing and approving IT plans from every agency and by creating the SITAC. Among other responsibilities, the SITAC is chartered with prioritizing IT projects on a state-wide basis.

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Currently, state-wide IT governance responsibilities include:

- ◆ **CIO** – The State CIO has broad, statutorily defined responsibilities for IT governance and oversight for the State. By virtue of having the ultimate responsibility for IT at the State, the CIO position plays a significant role in recommending and prioritizing IT initiatives – as well as their execution.
- ◆ **SITAC** – This relatively recently formed group includes representation from a variety of state agencies, as well as participation from industry and legislative groups, and is intended to serve as an advisory body for the CIO. The governance processes for this group are still in development. SITAC has not yet had an opportunity to participate in evaluating a major IT initiative.
- ◆ **Interim IT Committee of the Legislative Council** – This committee has the primary evaluation and oversight responsibilities for technology-related issues at this level of government.
- ◆ **Enterprise Architecture Committees** – This set of bodies is in the process of defining state-wide IT standards. The committees include working “domain” teams, an architecture approval board, and an executive steering committee. The collective group is still establishing the initial standards, but will eventually evolve into a set of standing committees for directing the evolution of IT standards at the State.

It is worth noting that several legislators indicated that they do not receive sufficient information to make informed IT decisions. A related finding is that state IT governance lacks standard requirements, tools, and methods for defining and tracking tangible business outcomes for projects. Given North Dakota’s relatively large investment in applications, such tools could provide valuable insight into the actual return on these expenditures.

AGENCY

Most IT investment decisions are made – at least initially – at the agency level. While ITD is developing tools for standardization, such as a business case approach, agencies are predominantly allowed to define the level of formality and rigor for these processes. Some agencies report having very formal, IT-specific processes, others use their general budgeting processes. Examining these individual processes in any level of detail was beyond the scope of this effort.

The primary exception to this distributed process is that each agency is required to submit a formal IT plan to ITD for review at the beginning of the budget cycle. Among other data elements, these forms ask agencies to identify IT projects and initiatives that will be part of their budget. Currently these plans are reviewed at a high level – ITD does not yet have mechanisms in place to examine them in detail or holistically as a group. While the plans do ask agencies to link IT investments to business objectives, most agencies reported viewing the plans as budget documents rather than strategic planning documents. Small agencies also indicated that the requirements were oriented toward large organizations and did not scale down well.

2. STRENGTHS AND OPPORTUNITIES FOR IMPROVEMENT

This section presents Pacific Technologies’ analysis of strengths related to the current IT governance approach – as well as opportunities for improvement.

IT GOVERNANCE STRENGTHS

The State is in the process of developing the fundamental elements of an effective IT governance process. As mentioned previously, the efforts to deploy a standardized business case approach will assist decision makers at all levels with fairly and equitably evaluating competing projects. Also, efforts are underway to further define and refine the governance roles and responsibilities of SITAC.

Another example of an evolving governance tool is the State’s Enterprise Architecture (EA) project. This inclusive process is well on the way toward establishing enterprise-wide IT standards for the State. Once approved, those standards will allow the IT decision-analysis to focus on the business issues – not the technology issues – and will accordingly improve the effectiveness and efficiency of IT decision making.

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The State has also done an admirable job in IT-related data collection. Agencies' IT plans not only provide a structure on which to build decision-making processes, they also collect a wealth of data that could be used for planning and analysis. This IT organization and management project has provided the State with in-depth insight into its IT labor distribution and governance practices. Most states involved in the nationwide survey (described in section E of this chapter) lacked access to such critical data.

Finally, this planning effort is indicative of an organization that is putting serious effort and consideration into improving its approach to state-wide IT management.

IT GOVERNANCE OPPORTUNITIES FOR IMPROVEMENT

Despite the IT governance-related advances the State has already made, several opportunities for improvement remain.

While the State should be commended for its data collection efforts, meaningful management information is still lacking. As previously noted, some legislators interviewed as part of this effort expressed concern that they do not have sufficient information to make informed IT decisions. Although IT expenditure data can easily be aggregated – making it one of the largest single expenditure items at the State – limited information is available regarding the attendant value of those investments.

Without requiring each agency to develop business plans, IT plans are not clearly linked – in a standardized way – to agency goals and missions. The absence of these linkages makes it difficult for external decision makers to evaluate investment requests. This should not imply that agencies do not create their own business plans or that they are not in fact aligned with agency IT plans – from our interviews it was clear that some agencies did just that. Instead, the State simply lacks a standard way for an external party to evaluate those linkages and overall performance-to-plan over a given time frame.

In evaluating and prioritizing the plans that are provided, reviewers lack a standard set of criteria for making decisions, and the agencies do not know the basis for evaluation that might be applied to their initiatives. Further, measures and targets for IT project and operational success are not well-defined, even though much of the data may already be available. Of particular note, there is no standardized mechanism for establishing cost-benefit performance targets and collecting performance-to-plan data – critical requirements to ensure that initiatives are achieving their targeted return on investment.

The application approval and oversight process also has contributed to fragmentation of the State's application architecture, and has not led to IT cost containment as it lacks a mechanism for taking a state-wide view. The State has yet to finalize standards that, when enforced through the approval process, would lead toward a more homogeneous application environment.

Although internal resources are generally available and often utilized, there are also no mechanisms in place to require effective project management or provide ongoing third party oversight – a critical requirement for major application initiatives. While ITD has established a planning and project management function within the agency, it is still developing and has not yet been made a required resource on major projects.

D. ADDITIONAL FINDINGS

In the course of conducting this assessment, Pacific Technologies identified several findings that – while important – do not fit neatly within the primary scope of this contract: IT organization and governance. This section provides a brief summary of those findings, as follows:

1. Lack of Workstation Standardization
2. Complex Application Architecture
3. No IT Innovation Funding Mechanism

1. LACK OF WORKSTATION STANDARDIZATION

North Dakota does not yet have a complete set of technology standards. Over the years the State has seen the proliferation of a wide range of technologies, applications, development environments, and operating systems across the enterprise.

This is particularly problematic in the area of workstations. Desktop computing environments around the State were reported to vary significantly between agencies. That variability included the full range of Microsoft operating systems from Windows 95 through Windows XP, as well as Apple Macintosh. Some agencies were very standardized, others mirrored the State-wide level of inconsistency internally. Workstation hardware has similar issues, with some agencies keeping very current with hardware, and others taking a slower and more piecemeal approach to replacement. Hardware also came from a broad range of vendors.

Some diversity is necessary – a single workstation standard would either not meet the needs of the State’s “heavier users” or it would have to be vastly over-powered (and over-priced) for the majority of users. Additionally, there are a handful of special purpose/special use workstations, as well as non-networked devices that an organization the size of the State will always require. However, the current level of volatility in even the basic desktop environment prevents the State from most effectively leveraging its buying power in the form of reduced costs. Perhaps more significantly, the configuration hodge podge further increases support costs as well as training costs for both users and service providers.

2. COMPLEX APPLICATION ARCHITECTURE

Section C of this chapter notes that the application approval process has not fostered cost containment. Specifically, the approval process (and lack of enforced standards) has done little to put controls on the computing systems and tools used in development. The resulting environment not only prevents the State from leveraging better license agreements through volume purchasing, but also requires a wide range of computing skills for users and application developers alike, which can, in turn, be expensive to maintain. The variety of development environments also fosters the need for unique workstation configurations, contributing to the problems noted above.

The State also lacks a comprehensive application inventory that could help identify opportunities for sharing investments and technologies, potentially contributing to cost savings through reducing redundancy.

3. NO IT INNOVATION FUNDING MECHANISM

The State lacks a mechanism for supporting pilot projects using new and emerging technologies. Public sector organizations typically do not operate on the cutting edge of technology, but they must keep up with technological advances and skills to effectively plan for using these emerging technologies in the future. Instead, these projects are largely initiated and conducted on a departmental basis, if at all, making them difficult to justify and fund, and impairing the State’s ability to gather broader “lessons learned.”

E. SURVEY RESULTS

In support of this project, PTI surveyed state IT executives. The survey was performed to identify staffing trends and key state IT spending and service delivery metrics for comparison with North Dakota.

Pacific Technologies contacted all 49 other states, and a total of 31 responded. Participants (either the CIO/CTO or their designate) were surveyed by telephone. We asked a subset of this group to participate in a more detailed data-gathering effort. With input from the National Association of State Chief Information Officers (NASCIO) and North Dakota's CIO, Pacific Technologies identified thirteen states to receive the more detailed survey. Of these, twelve agreed to participate; from this group of twelve, at least partial responses were received from:

- ◆ Kansas
- ◆ Kentucky
- ◆ Missouri
- ◆ North Carolina
- ◆ South Dakota
- ◆ Wyoming
- ◆ Texas

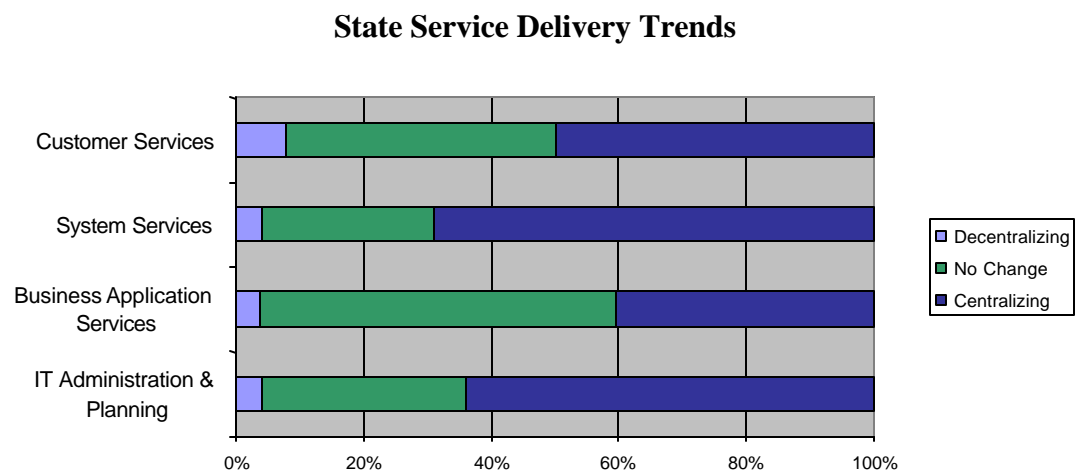
It is worth noting that *inability to provide the requested data* was the principle reason the remaining six states did not participate in the detailed survey – not unwillingness or lack of interest. In addition to direct contact with survey respondents, our consulting team also did its best to corroborate the findings utilizing publicly available information.

This subsection presents the results of the surveys. It also includes information about IT governance and industry trends. It is organized as follows:

1. Service Delivery Trends
2. Benchmarks
3. Governance Trends
4. IT Industry Trends

1. SERVICE DELIVERY TRENDS

The survey results indicate that **IT service delivery is either remaining as-is or is becoming more consolidated** in all but a handful of states, as indicated in the chart below:



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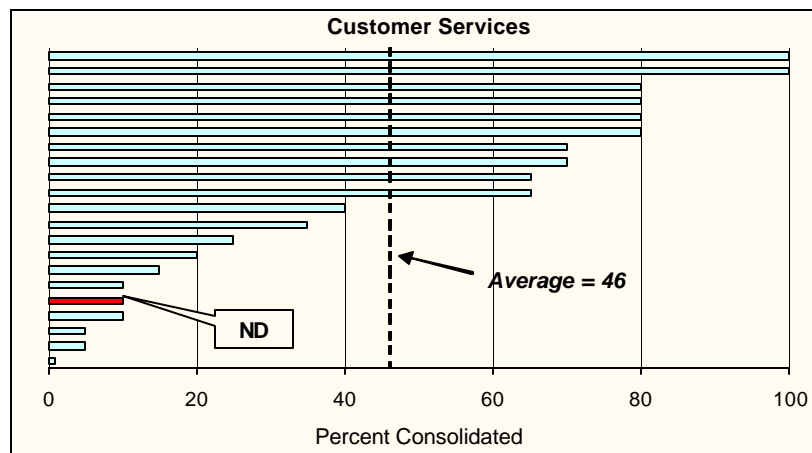
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In fact, several states have recently completed or are in the process of initiating efforts similar to North Dakota's. For instance:

- ◆ Virginia finished a consolidation study in December of 2002
- ◆ Illinois, Iowa, and Oregon have all released consolidation RFP's
- ◆ New Hampshire and Michigan are in the process of consolidating through either executive or legislative action
- ◆ Nevada and Alaska have studies in process

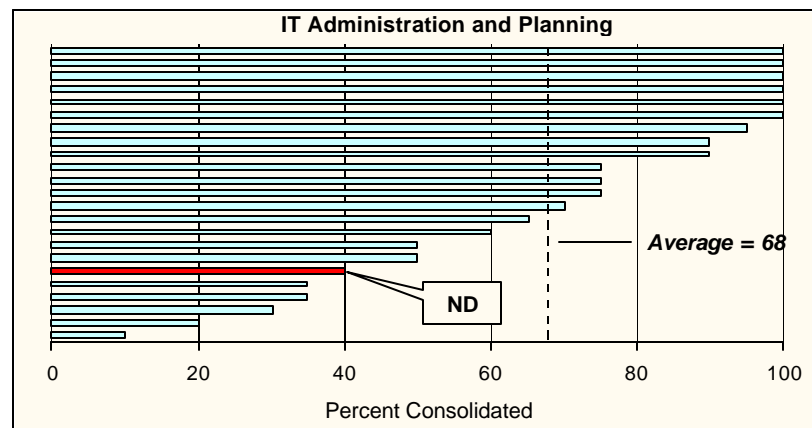
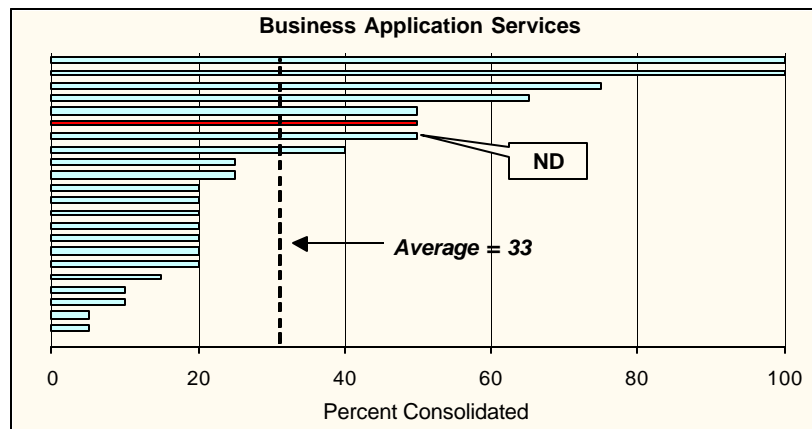
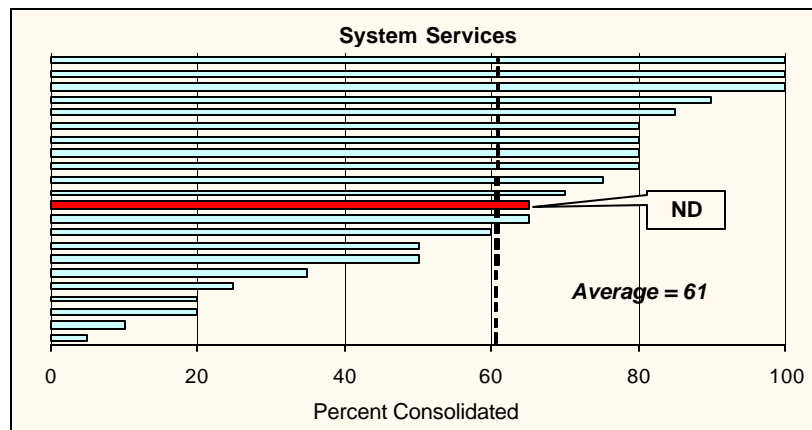
A central focus of this engagement surrounded the question: "Where is North Dakota on the decentralized-to-centralized continuum?" In response to that question, the following charts present **expected levels of consolidation** across the four major IT functional areas for the surveyed states, highlighting North Dakota's position on this continuum.

Expected Levels of Consolidation



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Overall, we find that:

- ◆ North Dakota's approach to application services is already more centralized than many states
- ◆ North Dakota's approach to systems services is on par with survey averages
- ◆ Both customer service and IT administration and planning represent areas in which North Dakota is significantly less centralized than other states

Appendix C includes more specific results from the survey.

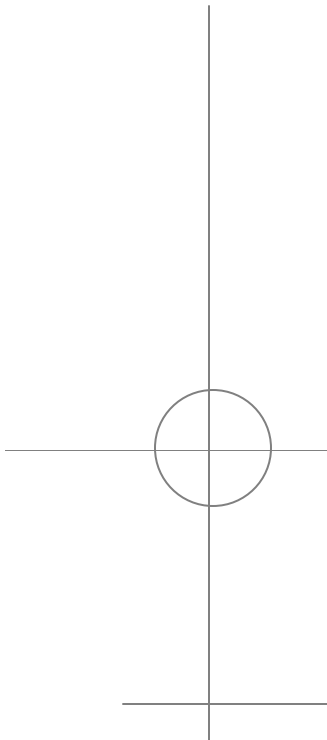
2. BENCHMARKS

This subsection presents the results of our more detailed survey. It also includes a comparison of ITD's rates for key services with rates from other states.

For the detailed survey, participants were asked to provide information on state demographics, staffing levels, and operating budgets. The data we received is restricted to the executive branches of the responding states. We validated the information through multiple phone calls to our contact at each state and independent budget research.

We did not adjust the data from other states to account for differences in services across jurisdictions. Because none of the respondents included a bank, we did remove the Bank of North Dakota's budget and FTE figures from the analysis. Both ITD and the North Dakota office of management and budget reviewed our North Dakota data.

The following table summarizes the key IT metrics collected by the survey. **In interpreting the information please bear in mind that, due to the relatively small sample size, the results are not statistically significant.** As such, Pacific Technologies cautions against placing undue emphasis on the rankings.



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Performance Metric Comparison

Metrics & Ratios	Average of All States	ND Relative to the Group Average	ND Rank in Group	North Dakota	Connecticut	Kansas	Kentucky	Missouri	North Carolina	South Dakota
State Population	3,580,524	-82%	7	634,110	3,300,000	2,688,418	4,041,769	5,595,211	8,049,313	754,844
Total Executive FTEs	38,641	-82%	7	7,097	50,000	35,225	39,000	52,517	73,355	13,294
Total Executive IT FTEs	1,262	-65%	6	443	1,030	1,561	1,624	1,449	2,450	276
Total IT FTEs as % Total FTEs	3.6%	+74%	1	6.2%	2.1%	4.4%	4.2%	2.8%	3.3%	2.1%
Total Executive Operating Budget	10,090,809,702	-83%	7	\$ 1,742,476,912	\$ 13,000,000,000	\$ 9,800,000,000	\$ 14,000,000,000	\$ 17,842,800,000	\$ 12,005,000,000	\$ 2,245,391,000
Total Executive IT Budget	209,579,281	-74%	6	\$ 55,154,058	\$ 245,000,000	\$ 150,600,000	\$ 262,000,000	\$ 168,126,910	\$ 548,000,000	\$ 38,174,000
Total IT Oper Budget as % Total Operating Budget	2.2%	+41%	2	3.2%	1.9%	1.5%	1.9%	0.9%	4.6%	1.7%
Total Citizens per Executive FTEs	87	3%	4	89	66	76	104	107	110	57
Total IT Operating Budget per FTE	\$5,315	+46%	1	\$7,771	\$4,900	\$4,275	\$6,718	\$3,201	\$7,471	\$2,872
Ttl IT Operating Budget per Citizen	\$62	+41%	1	\$87	\$74	\$56	\$65	\$30	\$68	\$51
Total Operating Budget per Citizen	\$3,064	-10%	6	\$2,748	\$3,939	\$3,645	\$3,464	\$3,189	\$1,491	\$2,975

The table illustrates several points:

- ◆ North Dakota ranks last in the group in population, total Executive branch FTEs, and total Executive operating budget, and next-to-last in total Executive branch IT FTEs, total Executive IT budget, and total operating budget per citizen
- ◆ Based on calculated metrics, North Dakota spends more on IT, in general, than most of the other states in the survey:
 - North Dakota ranks 1st in IT FTEs as a percentage of total FTEs (approximately 75% more than the average), meaning that North Dakota has relatively more IT FTEs than the other respondents
 - North Dakota ranks 2nd in total IT operating budget as a percentage of total operating budget (approximately 40% more than the average), meaning that North Dakota spends somewhat more on IT than the other respondents
 - North Dakota ranks 1st in total IT operating budget per FTE and total IT operating budget per citizen (approximately 45% and 40% more than the average respectively), again indicating that North Dakota spends relatively more on IT than the other respondents
- ◆ The greater numbers of IT FTEs is consistent with the level of application investment at the State
- ◆ The relatively lower operating budget per citizen in contrast with the higher IT budget per citizen may indicate that the State is gaining efficiencies from IT investments, perhaps showing that the State's IT investments allow North Dakota to "do more with less" in other areas

The table below presents comparison rate data gathered by ITD regarding services provided by counterparts in other states.

IT Rate Comparison

State	CPU Cost per Second(1)				Service Rates - Hourly			Telecom Monthly			Long Distance(2)	
	Batch	ADABAS	CICS	TSO	Systems Analysis	Programming	Project Management	T-1	Voice Mail	Phone Line	In-state	Out of State
AK	0.07	0.07	0.06	0.11				\$95 ⁽³⁾	\$3		0.060	0.060
ND	0.69	0.74	0.69	0.69	\$56.25	\$52.00		\$840	\$6	\$21	0.080	0.090
SD	0.16	0.16	0.16	0.16	\$48.00			\$650	\$10	\$11	0.105	0.105
MT	1.24	0.88	0.25	1.52				\$450	\$4	\$20	0.059	0.059
VA	0.01	0.01	0.01	0.01			\$97.00		\$10			
AR	0.8					\$59.00	\$67.00		\$2			

- (1) Mainframe models – and associated processing speed – varies between states making direct comparisons of cost per second misleading
- (2) Rate is based per minute
- (3) Rate is based per mile

Note that it is difficult to ascertain comparability of the rates presented above without much greater insight into how rates are calculated, what services are provided for the rate, what services may be provided elsewhere, how overhead is applied, and where associated charges such as facilities are accounted for. Given this uncertainty, the metrics presented on the previous page may serve as a better comparison tool.

3. GOVERNANCE TRENDS

The following information regarding IT governance at the states is summarized from several sources, including the 2002 NASCIO Compendium of Digital Government in the States.

CIO LOCATION WITHIN THE ORGANIZATION

At the time of the survey, a plurality of the states (23) place the CIO within independent IT departments or offices, as opposed to being housed within another department (e.g., the administrative or finance department). At 17 of the states, the CIO manages an IT function that is a division within a department. In seven states the CIO is located in the governor's office, with the IT function housed within a department; in these cases, the CIOs oversee offices that are primarily policy and/or standards-setting oriented and do not have direct operational responsibility.

IT GOVERNING BOARDS

Most of the states utilize a governing body, usually a commission or committee, to oversee the IT function. While in a few cases (including North Dakota) the body serves as an advisory group, most of these boards provide review and approval of enterprise-wide standards, policies, and procedures. The CIO usually acts as chair or leader of the committee, and several sub-groups may exist as well to handle specific issues (e.g., digital government, security, etc.) under the umbrella of the IT governing body.

STATEWIDE IT PROCUREMENT RESPONSIBILITY

About 25% of the state CIOs hold responsibility for procurement on a state-wide level for IT services, hardware, and software. This generally occurs above an established threshold amount. Half report sharing this responsibility with a central procurement office, and others report having no direct responsibility for procurement.

SERVICES PROVIDED AND OUTSOURCING

The services most commonly offered by state IT functions include architecture development, network administration, project management, and website/portal development. Fewer than 10% of the states are outsourcing any service entirely (for example, the State of Alaska has entirely outsourced the provision of its wide area network to a telecommunications vendor). About 30% of the states report providing a combination of direct services and outsourced services. The most commonly outsourced service is training – approximately half of the states are providing training services in-house.

In the private sector, outsourcing remains one of the few growing sectors in IT and networking. While the term “outsourcing” can mean almost any type of contracting for outside services to meet organizational IT needs, in its strictest form outsourcing involves the formal transfer of an IT or network operation to an external service provider, including the physical assets and personnel. Most outsourcing contracts involve “selective outsourcing” or “out-tasking;” these deals are generally worth less than \$100 million each. This form of outsourcing, while the most common, makes up just four percent of the nearly \$390 billion total value of the outsourcing contracts signed during the last 14 years. A recent survey of companies found that 55 percent of respondents are either currently outsourcing some IT functions (40 percent) or considering outsourcing in the next twelve months (15 percent).

4. IT INDUSTRY TRENDS

This section presents a brief overview of the most significant IT industry trends that will impact IT spending over the next five years, organized as follows:

- ◆ Network
- ◆ Application
- ◆ Governance
- ◆ Other

NETWORK

Wireless – As the wireless market evolves and matures, new opportunities and challenges will continue to present themselves to the State. Given North Dakota's low population and relatively large area, it is likely that North Dakota will receive these services after most of the rest of the country. Commercial vendors will offer new services and eliminate others, as faster, more robust protocols are designed, approved, and deployed. For example, in many areas of the country, public safety agencies have relied on vendor-supplied CDPD (cellular digital packet data) service for wide area transmission of data. This is being phased out in favor of GSM/GPRS (Global System for Mobile/General Packet Radio Service), which will provide greater bandwidth for users.

VoIP (Voice over IP) – This technology has been waiting in the wings, but is now being deployed in the public sector more commonly. Telecom vendors are phasing out their PBX offerings in favor of systems that allow voice traffic to be carried over the same infrastructure as data. In addition to consolidating equipment and support skills, many organizations save money on long distance phone service by utilizing this technology.

Speed – Greater network bandwidth and higher data transmission speeds will continue to become available, which will require IT infrastructure to be upgraded for compatibility. Furthermore, as buildings are remodeled and new construction takes place, the State will need to understand the options and potential complications to compatibility of existing and new infrastructure components.

Single Sign-on – Continually-evolving software, networks, and business processes can lead to a complex environment. Security and convenience needs are pointing to a world in which users are given a single password to access the resources they require to perform their jobs.

Open Source – Operating systems other than those provided by Microsoft are becoming viable options for many tasks, and, significantly, are finding their way into major corporate environments (Ford Motor Company, for example). Security concerns and smaller budgets are driving increasing public sector interest in these alternatives.

APPLICATIONS

Digital Signature – Several key barriers remain to expanding the services that are offered by government on the Internet. Authentication (verification of identity) is one of these, and digital signatures are a way to ensure that people are who they say they are, as well as enforcing non-repudiation (denial that one has agreed to a contract). Since the passage of the Esign Act in 2000, the use of digital signature technologies in the public sector has been slowly increasing.

Web Services – This term refers to the middleware that enables and simplifies application-to-application connectivity over the Web. Web services differ from other forms of middleware in that they are based on standards that arose and continue to be developed in the wake of the Internet. This way of looking at constructing applications is demanding a new set of skills, and promises to ease data sharing between organizations.

Business intelligence & integration – This category represents a broad range of software and solutions for gathering, consolidating, analyzing, and providing access to data that includes data warehousing, database querying, and data mining. As applications are upgraded and new software is

added to an organization's portfolio, integration of data between applications and various elements of the organization is expected to increase.

Cross-jurisdiction cooperation – Cost savings and service improvement benefits are driving public sector organizations to share infrastructure, applications, and facilities when possible, especially in the areas of public safety, permitting, licensing, and recreation. Regional dispatch centers for public safety, Web portals, and on-line permits, licenses, and park reservations represent common examples of this type of cooperation.

GOVERNANCE

Accountability/Performance Management – Government organizations, like the private sector, continue to look for ways to quantify the benefits of their IT investments. Disciplined approaches to the improvement of performance in public sector IT activities (such as performance and program-based budgeting) are receiving increasing attention, especially as organizations are faced with budget shortfalls and IT service providers seek to demonstrate the value that they provide.

Expanded Replacement Funding – While ongoing replacement funding for IT assets is well-established in the public sector as a way to ensure that PCs remain up-to-date, public sector organizations are expanding the notion of replacement funding to include core components of the IT infrastructure and major application software.

OTHER

Personal Digital Assistants (PDAs) – The growing use of PDAs is forcing the issue of whether to bring them into the IT fold. They tend to drive up the workload of IT support staff as users seek assistance with configuration, and synchronization with their desktop PCs – despite the lack of standards and support agreements with users.

Privacy – Homeland security concerns, HIPPA regulations, and the ongoing debate over public use of personal information point to a continuing need for attention to this area.

Storage Requirements and Management – Recently, the State has embraced alternatives to server-based disk storage such as storage area networks (SANs), network attached storage (NAS) devices, and other "storage appliances" which are becoming a popular response to exploding storage requirements. As the State consolidates servers, these technologies will play an increasing role in the provision of affordable, reliable, and secure data storage.

F. REVIEW OF STATEWIDE INITIATIVES

In addition to reviewing the State's IT organization and governance function, this study involved an evaluation of state-wide IT initiatives currently underway, including:

1. Geographic Information System (GIS)
2. Wide Area Network (WAN)
3. Criminal Justice Information System (CJIS)
4. ConnectND
5. Enterprise Architecture (EA)

The first four initiatives were specifically identified in the initial scope of work for this project. Pacific Technologies identified EA as a fifth state initiative to be included in this analysis.

North Dakota has made significant progress in some of these areas, less progress in others. Comparatively, the State is better off than many of the other states that participated in our benchmarking analysis. The table below summarizes the other states' progress with initiatives similar to North Dakota's.

Status of Surveyed States on Similar Initiatives

Initiative	States with Initiative In Place*	States with Initiative In Progress	States with No Initiative
Wide Area Network	28 (ND)	2	0
Enterprise Resource Planning (ConnectND)	17 (ND)	2	11
Criminal Justice Information Sharing	11	10 (ND)	7
Geographic Information Systems	8 (ND)	4	18
Enterprise Architecture	18 (ND)	3	8

(ND) indicates North Dakota in survey

* "In Place" includes states with at least some major aspect of the initiative in production

The remainder of this section provides a summary analysis of each initiative.

1. GIS

The State recently undertook a major effort to create a unified state-wide database for its geospatial data. The goal of the project was to provide a single source for common data elements, rather than to replace agency-specific efforts. Our nation-wide survey indicated that North Dakota was ahead of most other States in this arena. This project is largely complete and now in an operations and maintenance mode.

GOVERNANCE

Governance for this project is provided by a cross-agency governance committee and a GIS coordinator in ITD.

RISKS

The most significant risk relates to funding. There is no dedicated fund or guaranteed revenue stream (such as from internal cost recovery or external map sales). The majority of the dollars come from the general fund. If that source were to decline, the GIS project would need to identify additional sources of revenue – or reduce service.

Additionally, though a much lower risk factor, project participation is voluntary. The value of this effort is in having all key players participating and contributing to the base data set. If a contributor elected to opt out, the result would be a reduction in quality for all users. The likelihood of this risk coming to fruition or of the impact being significant are both relatively low.

FUTURE REQUIREMENTS

The State should explore options for ensuring that revenue streams can be guaranteed in the future. This could be through establishing a dedicated fund or creating products based on the data or services that can be sold for a fee. Additionally, the State might consider making participation in the governance process a requirement for all agencies with a GIS function.

North Dakota also should periodically evaluate its performance in this area. This evaluation would include an environmental scan of new technologies, as well as a survey of other jurisdictions to ensure the State remains at the forefront in developing and utilizing this valuable enabling technology.

2. WAN

The State's WAN initiative, like the GIS initiative, is largely completed. It has moved into maintenance- and enhancement-related activities. The State's goal for the WAN focused on telecommunication cost savings, improved remote connectivity, and linking political sub-divisions state-wide. Currently the Wan connects State agencies as well as nearly all of its political subdivisions (e.g., counties, school districts, etc.). Beyond basic connectivity, it has provided significant benefit for certain users. For example, smaller and remote school districts are effectively using this tool to provide distance learning opportunities. Similar to the GIS initiative, North Dakota is farther along than many other states, particularly with regard to the breadth of connected organizations.

GOVERNANCE

This project has two cross-agency governance bodies; one is executive and the other is technical. They include representation from several agencies, ITD, and the university system.

RISKS

Risks facing the project are largely technical in nature. The magnitude of the project – both in cost and complexity – required the State to accept higher-than-normal levels of risk in some areas. Specifically, this includes single points of failure for some of the remote connections (i.e., if one circuit were to fail, the connected region would be cut off from the rest of the network, and potentially other organizations within the region).

Additionally, the high level of interconnectivity inherent in the system – a core benefit of this project – makes the entire system susceptible to slow downs or – potentially – failures as a result of individual problem incidents (e.g., a virus attack) within one of the connected networks. The high connection cost also makes it difficult for small, remote offices to justify linking to the network.

A more strategic risk for this effort is the lack of use. State agencies are required by law to use the network for telecommunications. However, many of the advanced applications the system was designed to accommodate (e.g., video conferencing, video-on-demand, etc.) have seen little utilization.

FUTURE REQUIREMENTS

To increase use and to ensure the State realizes the greatest return on this ongoing investment, ITD should increase customer outreach. These marketing efforts should be targeted at providing current and potential system users with a clear delineation of possible services and the attendant benefit to the business units. In support of an outreach effort, ITD should explore options for making resources available that allow users to take advantage of the network's advanced functionality, including broader availability of videoconferencing equipment for state agencies and political subdivisions.

Finally, the State must continue investment in this asset to ensure it maintains its value as technologies, applications, and user requirements change and adapt.

3. CJIS

The State's CJIS efforts are still in their nascent stages and, accordingly, are somewhat in flux. The State has identified a "hub" approach for this initiative, which calls for North Dakota to be responsible for creating the infrastructure necessary to let the numerous justice-related applications in use across the State exchange data. For agencies without adequate or appropriate applications, the State has purchased a system that it will run for interested agencies as a service.

The State previously commissioned a study to examine options for this initiative. The current approach is a result of that engagement. North Dakota's limited progress on this initiative is similar to other states in our survey.

GOVERNANCE

Project governance is provided primarily through two multi-jurisdictional planning groups – the CJIS Board and the CJIS Executive Committee. The Board sets overall policy and direction for CJIS at the State and is comprised of the Chief Justice of the North Dakota Supreme Court (or designee), the North Dakota Attorney General (or designee), and the State CIO. The Executive Committee addresses specific technical and tactical issues, including budget allocation and defining exactly what data is shared and how. It is comprised of representatives from ITD, the Judicial Branch, the Attorney General's office, the Department of Corrections, North Dakota State Radio, the Highway Patrol, the North Dakota Attorney's Association, the North Dakota Chief of Police Association, and the North Dakota Sheriff's Association.

RISKS

The project faces numerous, significant risks that will need to be addressed if this effort is to be successful.

The project architecture is ambitious and labor-intensive. Very few states claim to have successfully implemented state-wide criminal justice information systems – an indicator that these efforts are difficult. In addition, taking on the added responsibility for running a records management system as a service is a significant, extra body of work. The State also must somehow recoup that investment, which will be difficult if it cannot sell the service to enough justice organizations in North Dakota.

The consultants hired by the State estimated project costs to approach \$5 million, however only \$2 million in funding has been identified from over 50 agencies. The overall shortfall, combined with the diluted funding approach, ties the success of this initiative to the outcome of future fund raising efforts – a difficult prospect given current economic conditions. Additionally, no funding source has been identified for the operations and maintenance costs.

As with GIS, agencies are not required to participate. As each agency brings a piece of the overall data set to the table, agencies choosing to opt out of the project could result in significant holes in the data model. Different funding levels and differing desired benefits across the participating agencies present a significant governance barrier to this project.

FUTURE REQUIREMENTS

If CJIS is a state priority, it must have adequate funding and a clear mandate for participation and use.

Given the complexity of the effort, the State should also establish management requirements for early issue identification, allowing the project team to course correct before problems become large – and expensive. In addition to ensuring the use of experienced and trained project management resources, the State should also employ third party oversight at key check-points throughout the project. Participants should also identify success measures and outcomes *now* – and begin gathering baseline data if necessary – to help determine the ultimate success of the effort and identify areas for future improvement.

Finally, a reliable method for providing ongoing maintenance funding must be identified before the project is too far along. If the State cannot identify an adequate source for these funds in the near term, the value delivered by the project will rapidly dissipate.

4. CONNECTND

ConnectND is the State's project to implement PeopleSoft financial management, human resources management, and student information management software. The project is a joint effort between state administration and the State's university system.

The effort aims at implementing PeopleSoft with as few modifications as possible, adjusting state business practices to meet the software's functionality. Seventeen of the thirty-one states surveyed as part of this engagement indicated that they had modern ERP systems in place. Two more of the surveyed states have projects in progress.

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GOVERNANCE

The project has a well-established governance model. An executive committee is responsible for internal project oversight. The decision-making process to initiate the project also had several key elements of good governance, including employment of decision-support tools, such as return on investment (ROI) analysis.

RISKS

Projects of this size and complexity inherently entail significant risk – there is a long history of major project failures in this industry. Additionally, North Dakota’s reliance on implementing the system “vanilla” (i.e., with minimal modifications) to stay within budget – while commendable – requires a level of restraint and acceptance of change that often is difficult to achieve. Of particular concern in this regard is the potential lack of user acceptance with a new system – especially one implemented vanilla – that will be very different from current systems and associated processes.

Additionally, while the project’s internal governance appears sound – indeed, the effort is reported as being on-time and within budget – the State must pay additional attention to this project. Specifically, the State not using third party oversight – at least at key milestones – could lead to large (and expensive) surprises if the project begins to go off track.

Finally, the State has not measured “before” baselines to enable tracking of success measures for the project.

FUTURE REQUIREMENTS

The State must start collecting baseline measures *now* to ensure that performance improvements are realized – and adjustments can be made as appropriate.

The project team must continue to focus on ensuring that “vanilla” implementation remains a high priority. Modifications can be expensive and the project neither has the time nor the funding to absorb anything but the most minor of modifications.

Finally, the State should explore bringing in an objective third-party at key milestones of the project to evaluate progress and identify specific areas of concern. Any project has some risk of deviating from plan. A project of this complexity increases that risk, and the size of the project makes even the smallest deviations potentially expensive. Third party evaluations reduce the likelihood that something is missed by the project team and help mitigate the myopia that can bloom in project teams focused on completion.

5. EA

The State’s EA project is aimed at establishing a set of state IT standards. North Dakota’s approach is very similar to that in use by other states and recommended by the National Association of State CIOs (NASCIO). Beyond just reducing the sheer number of technologies in place at the State, the long-term goal of this effort is increased efficiencies, both in support and procurement costs.

The project is mid-path. Project domain teams have already created several work products including initial summaries of existing technologies and related goal states. Unfortunately, the introduction of HB 1505’s server consolidation effort slowed EA progress. Many of the agency staff involved in HB 1505 negotiations also served on the EA teams, and the focus on the consolidation project took attention away from EA, and generally diminished enthusiasm for ITD-led projects.

Compared to other states, North Dakota appears slightly behind in establishing enterprise IT standards. That may be partly driven by North Dakota’s effort being more comprehensive and inclusive than the projects in some of the other states. Nonetheless, we did survey states that had successfully gone through a nearly identical effort.

GOVERNANCE

Governance was established early on as part of the EA process. It is somewhat complex due to the number of domain teams involved. An executive committee oversees the project, with an architecture review board managing most of the high-level decision making. The remainder of the governance structure relies on a set of working teams that make recommendations for the State's IT architecture.

RISKS

The primary risk is that the State cannot reestablish EA as a state-wide priority and deliver product in a reasonable time frame. As the effort takes more time, its value and its potential for success begin to decline.

There is also a risk that, once the standards are finally established, the State will have been unable to effectively limit the number of products and technologies. This was a concern raised and evidenced in some states included in our survey.

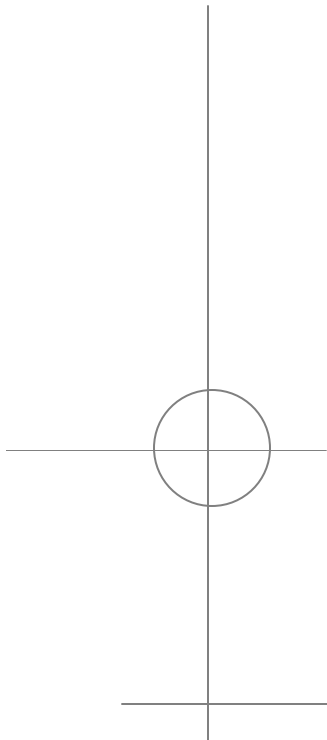
Another significant risk with the final product may be the State's ability to implement the chosen standards. This engagement identified a great deal of variation in the State's application and technology architectures. If adhering to a standard would require mass changes in the existing software and infrastructure, the State will be faced with making a potentially-daunting investment – perhaps too costly to implement in a timely manner.

Agency perception is also a concern. Some agencies interviewed for this project indicated that the time demands were too great and that little progress had been achieved. Some agencies also felt the process was too ITD dominated and that the architecture review board has proven to be a bottleneck.

FUTURE REQUIREMENTS

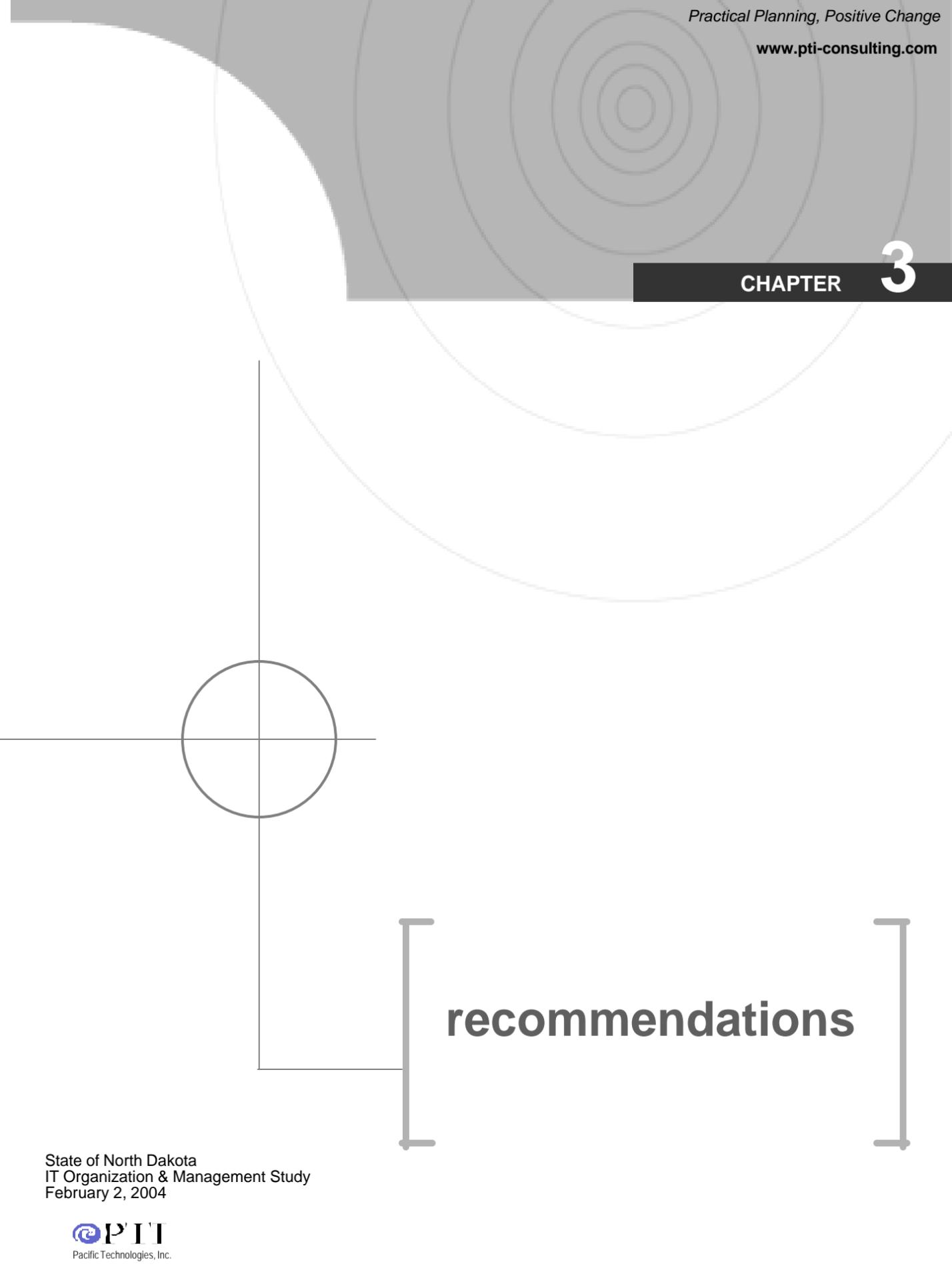
The State must re-focus its efforts on EA to move it quickly toward an approved and finalized set of standards. This requires continuing participation at all levels, as well as a stronger push to resolve conflicts and get to effective compromises. It will also require greater scrutiny into implementability to ensure the end product provides value to the State.

Additionally, the State must ensure that, once the “final” standards are in place, mechanisms for keeping those standards maintained, enforced, and up-to-date, are established; and that adequate resources are applied to those functions. Specifically, the State has barely begun developing the long-term organizational and decision-making aspects of the full EA process it is attempting to follow.



CHAPTER

3



recommendations

A. INTRODUCTION

The following strategic IT imperatives framed our recommendations for the State of North Dakota:

- ◆ *Provide basic IT services as a state-wide “utility” – highly available, consistent, and configured to maximize economies of scale*
- ◆ *Performance-manage IT at both the agency and enterprise levels*
- ◆ *Adopt best practices, where they make sense*
- ◆ *Favor long-term improvement over short-term considerations*

This chapter presents Pacific Technologies’ IT organization and management recommendations. We developed these recommendations through an iterative process, including preliminary presentations to SITAC and the Interim Information Technology Committee of the Legislative Council.

We have organized the remainder of this chapter as follows:

- B. Consolidation Recommendations
- C. Cost Impacts
- D. Organizational Impacts
- E. Governance Recommendations
- F. Additional Recommendations
- G. Transition Approach
- H. Implementation Plan Outline

B. CONSOLIDATION RECOMMENDATIONS

This section recommends an overall direction for IT organization at the State, specifying which IT functions should be consolidated and which should remain decentralized. It also recommends the infrastructure changes needed to support this approach, and summarizes our analysis of alternative approaches.

These recommendations apply to the Executive, Legislative, and Judicial branches of government across the State.

1. OVERALL DIRECTION

We recommend that the State:

1. **Centralize all aspects of Desktop Services**
2. **Continue consolidation of servers and server administration in ITD**
3. **Leave provision of Business Application Services unchanged**

Centralization of other IT services should be left to agency discretion. *In theory*, this approach could deliver more than \$680K in annual labor savings, along with smaller but significant amounts in equipment replacement savings. This figure does not include amounts related to reduced IT labor effort in the agencies for IT management and services related to server administration, such as storage management and security administrations. Savings will accrue in these areas. This amount also does not account for the recurring annual costs associated with the purchase of software that is included in the recommendation. In addition, there will be various one-time costs associated with any implementation of these recommendations. Section H of this chapter provides estimates of the additional expenditures.

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While this recommendation centralizes delivery of IT infrastructure-related services, it retains a federated IT service model at the State. In particular, it leaves the sourcing of business application service labor up to the agencies.

There are two other possible directions which we do not recommend, but which merit discussion:

- ◆ **Decentralization** would move some or all of current ITD services out to the agencies. We believe this would increase state-wide IT costs, and in some cases seriously degrade service. Application support is currently either centralized or decentralized at agency discretion. We assume that the agencies are already making rational economic choices in this area, so forced decentralization would likely increase costs. Many other ITD services (WAN, mainframe, e-mail, etc.) are enterprise in nature. Attempting to decentralize these functions would diminish service quality – and run counter to best practices.
- ◆ **Complete centralization** would remove all IT functions from the agencies and turn them over to ITD. This would achieve some further staff reductions in the IT administrative and planning areas, but no savings would be gained in agency application support because this workload would not benefit from economies of scale. Our analysis shows the higher costs of ITD staff would likely cancel out any savings from staff reduction. More importantly, taking application support staff away from the agencies would weaken the relationship between IT staff and end users, making applications less supportive of agency business needs. Appendix D presents a potential model of centralized IT service delivery for the State.

2. FUNCTIONS TO BE CONSOLIDATED

The following outlines our specific consolidation recommendations for two key functions:

- ◆ Desktop Services
- ◆ Server Administration

DESKTOP SERVICES

At \$2.5 million in annual labor expenditure, this function is second only to agency-specific application support in state-wide costs. ITD's support of this function is limited to the WAN help desk – otherwise the State's desktops are supported by a mix of agency help desks, application support staff, shadow staff, and the Association of Counties. This patchwork support model largely mirrors the diversity of desktop configurations and standards that have resulted from decentralized workstation deployment.

Our analysis shows that up to \$519K in annual labor savings could be achieved by centralizing and automating Desktop Services. (This figure is not inclusive of the costs of purchasing and maintaining software that would be required to support this effort.) In addition, following the best practices trend toward a “managed desktop” approach will lower long-term equipment costs and maximize end-user productivity.¹

To accomplish this, we recommend that the State:

- ◆ Establish a fully-functional help desk for Tier 1 (i.e., call center) support in ITD
- ◆ Have ITD establish a Tier 2 (i.e., dispatched technical staff for workstation-related problems) support unit with staff appropriately co-located in major agencies and key remote sites
- ◆ Have ITD work with impacted agencies to arrange for shared, contracted, or ad hoc support in remote locations as necessary
- ◆ Deploy a standardized desktop with appropriate management tools for centralized administration, as further described in subsection 4 – Related Infrastructure Recommendations

¹ Note: This recommendation does not apply to special devices, including PDAs, stand-alone laptops, etc.

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- ◆ Centrally support the standard desktop software and state-wide applications (i.e., MS Office, email, calendaring, and ConnectND)
- ◆ Mandate agency use of the desktop standard and the ITD desktop support services, with exceptions granted by ITD when necessary
- ◆ Target a ratio of approximately 200 workstations per desktop support FTE, managing toward a higher ratio as standardization occurs, tools are deployed, and support skills mature
- ◆ Identify standard exceptions, such as lab machines, special-purposes computers (e.g., point of sale), non-networked and rarely-networked devices (such as some laptops and PDAs), etc.

SERVER ADMINISTRATION

HB 1505 has been a major step in the direction of consolidating server administration at the State, resulting in significant cost savings. However, much work remains to be done in proceeding methodically toward the goal of maximizing efficiency in this area.

We estimate annual *labor cost* savings of \$294K from the first stage of consolidation. **Our analysis shows that up to \$162K of potential additional annual labor savings is available through continued consolidation efforts, building to that number over the next several years.**

To accomplish this, we recommend that ITD:

- ◆ Assume responsibility for hosting and administering the remaining servers still under agency control, including the Judicial and Legislative branches
- ◆ Reduce the total number of servers through aggressive consolidation of similar platforms and sharing applications on servers where possible
- ◆ Reduce staff as needed to keep a ratio of approximately 29 servers per administrator

In addition, to the potential labor savings in server administration, this recommendation will reduce the State's server replacement costs.

Note that cost savings do not serve as the primary driver behind our desktop services and server administration recommendations. We also make them within the context of:

- ◆ Positioning the State for the long term, including the ability to performance-manage IT and improve IT service levels
- ◆ A desire to move the agencies out of the IT infrastructure business, allowing them to focus on core business operations
- ◆ Best practices for geographically-compact organizations
- ◆ Viability, in light of the current allocation of related responsibilities across agency IT staff²

3. FUNCTIONS TO REMAIN UNCHANGED

We recommend that end-user application support and agency-specific application development and maintenance remain as-is. Agencies will continue to choose between ITD programming staff, their own staff, and contractors as needed. This gives agencies maximum flexibility in finding the best support alternative for their core business automation needs.

² It would be difficult to centralize Tier 1 activities exclusively, as only seven agency staff spend 50% or more of their time on related activities. Centralizing all of Desktop Services is more viable, as 30 agency staff spend 50% or more of their time across those functions. If we also include server administration, it is worth noting that 41 agency staff spend 50% or more of their time in the combined capacity. See Appendix B for a more detailed staffing breakdown.

Long-term, we recommend that the State move toward a limited set of application development tools defined by the EA process, eliminating the use of non-standard development tools. This will improve the utilization of programmer skills, lessen dependence on contractors, make it easier to interface between systems, and reduce development platform costs.

IT Planning and Administration functions should remain a mix of centralized and decentralized support, but will be affected by the other recommendations in this report. Specifically, the processes of IT strategic planning will be improved by the governance recommendations in Section E of this report. IT procurement and IT asset management have a current labor cost of \$435K per year, most of it in the agencies. While our analysis has not identified a specific savings amount, we would expect to see this figure reduced in a managed desktop environment.

Other System Services will continue as-is, but may also be affected by the centralization of Desktop Services and Server Administration. We would expect total labor effort devoted to services such as storage, database, and security administration to drop due to economies of scale, reduction in the number of servers, and a simplified desktop environment. Agency IT management labor should also go down as the number of IT staff decreases. *Note that our calculated available cost savings do not include savings in these areas.*

4. RELATED INFRASTRUCTURE RECOMMENDATIONS

Gaining the full benefits from centralizing Server Administration and Desktop Services will require server upgrades, desktop standardization, and deployment of centralized management tools as summarized below.³

SERVER UPGRADES

Achieving the recommended reduction in the number of servers will require significant work over time from ITD. Each server shifted from agency to ITD control will require analysis to determine whether its functions can be moved to a shared server. In some instances, server platforms and applications will need to be upgraded to current versions. In other instances, it may be best over the long term to migrate the application to ITD's standard platform.

To the extent practical, ITD should time these upgrades to the normal server replacement cycle, minimizing the extra capital outlay required. However, there will be some instances where the benefits of migrating to ITD's standard platform will require an out-of-cycle investment. As capacity requirements grow, ITD may also need to purchase a few additional shared servers.

DESKTOP STANDARDIZATION

One key to achieving the recommended PC-to-support staff ratio is a standardized desktop. ITD and the agencies must develop a limited number of standard configurations for the State. The State will choose a single vendor to supply the equipment to the agencies, preloaded with the appropriate standard configuration and any chosen options. ITD will charge additional fees to support non-standard desktops after the transition period. The agencies will be responsible for managing non-standard and business-specific applications (e.g., Photoshop, Pagemaker, etc.) as well as the replacement cycle for non-networked computers defined as exceptions to the consolidated support service recommendation. In addition, a means of allowing for exceptions from the standard should be provided to ensure that specialized needs can be met.

Investments in the standard desktop will also be timed to equipment replacement cycles where practical. However, completing the standardization in a timely manner may require some out-of-cycle equipment purchases, as well. We suggest that the State define between 2 and 4 specific hardware configurations intended to meet the needs of all levels of desktop computing at the State.

³ Please see section D of this chapter for the organizational impacts of these recommendations, and section G of this chapter for more detail on transitioning to them.

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Hardware roll-out can either be conducted en masse, or spread out over time as existing computers require replacement. Further study is needed to determine the best implementation approach. Funding and staff availability will be important constraints that will inform the final roll-out schedule.

The system operating environment (i.e., operating system, common applications such as MS Office, and the configuration of each) should be tightly controlled. Specific agency requirements are likely to dictate a handful of configuration variations, however software and operating systems should be identical across the State.

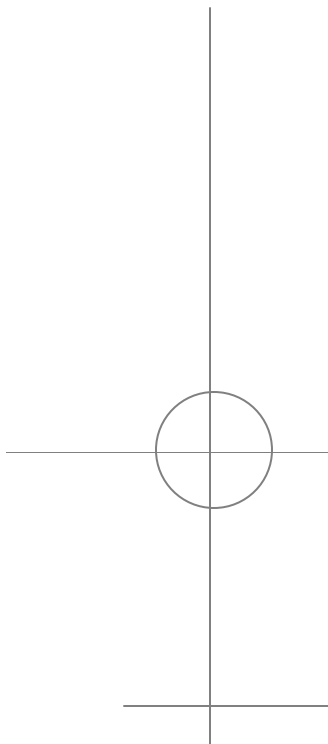
These standards should be set and rolled-out in conjunction with the hardware standardization. Effectively implementing this standard will require a great deal of participation and testing on behalf of the agencies.

To maintain standardization at the State over the long term, North Dakota must implement a process for keeping the technology refreshed (i.e., updating the workstation and software configurations to meet current market offerings). Workstations typically have a three- to four-year lifespan, depending on the exact business function and technological demands. Accordingly, Pacific Technologies recommends giving agencies the option of selecting between replacement schedules – whichever will best meet their business and fiscal requirements.

The mechanism for this process will need to be resolved separately. The State can either use a replacement fund, with an appropriate fraction of the replacement cost of each workstation (i.e., either one-third or one-fourth) set aside each year into a fund for payout at replacement, or alternatively, the State can choose to contract with a third party to manage PC life-cycle as a service with a monthly charge. Traditionally the second option has often proven more expensive and less flexible, but ITD has been in exploratory discussions with vendors that make this alternative appear promising. Combining a service fee-based option with a help desk outsourcing proposal could potentially provide additional cost savings on one or both sides of the equation.

CENTRALIZED MANAGEMENT TOOLS

Another critical success factor for consolidation of Desktop Services is *centralized management of the desktop*. Help desk staff will need remote control software to effectively diagnose problems. To keep the standard desktops up-to-date, workstation administration staff will need a suite of management tools that automate deployment of software upgrades. These tools will also help automate virus protection, centralize some parts of workstation security, and allow ITD (or the agencies) to monitor acceptable use policies.



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5. RECOMMENDED IT SERVICE PROVIDER

To expand upon the recommendations described on the preceding pages of this chapter, the following table identifies the recommended (i.e., “target”) provider for the array of IT services currently in place at the State.

IT Function	Target Provider	Current Provider
Customer Services		
Help Desk (Tier 1)	ITD	Mixed
Workstation support (Tier 2)	ITD	Mixed
End user application support	Agencies*	Mixed
Training	Mixed	Mixed
System Services		
Network connectivity	ITD	ITD
Email administration	ITD	ITD
File/print administration	ITD	Mixed
Other server administration	ITD	Mixed
Workstation administration	ITD	Mixed
Storage management	ITD	Mixed
Data center operations	Mixed	Mixed
Database administration	Mixed	Mixed
Security administration	Mixed ⁴	Mixed
Telephone systems support	Mixed	Mixed
Business Application Services		
ConnectND	ITD	N/A
Agency applications	Agencies*	Mixed
IT Administration and Planning		
Strategic planning	Mixed	Mixed
Research and development	Mixed	Mixed
Disaster recovery management	Mixed	Mixed
Asset management	ITD	Mixed
IT procurement	ITD	Mixed
Project management	Mixed	Mixed
Administrative support	Mixed	Mixed
Departmental management	Mixed	Mixed

* While ultimately responsible, agencies may choose to contract with ITD to provide this effort.

Based on our experience, quantitative analysis, and best practices research, we believe **utilizing the “target provider” for each identified service will result in the best balance of cost efficiency and service quality for the State of North Dakota.**

Please see Section D of Chapter 3 for additional detail on agency versus ITD roles and responsibilities under the recommended service approach.

The remainder of this subsection discusses the applicability of outsourcing.

APPLICABILITY OF OUTSOURCING

While Pacific Technologies believes that outsourcing may be a viable alternative for providing workstation replacement and Desktop Services in North Dakota, it is premature to make such a recommendation at this time.

As part of our work, we reviewed informal outsourcing pricing received by the State from one vendor. The services included workstation replacement and aspects of Desktop Services. This vendor suggested a hardware replacement cost of \$750 per workstation (approximately \$21 per month on a

⁴ Agencies will provide Security Administration for applications and database management systems (DBMS) only.

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three-year cycle, \$17 per month on a four-year cycle). The preliminary bid also included pricing for the Microsoft Office suite, remote desktop management software, and on-site staff to provide support. It did not specify service levels.

Pacific Technologies contacted the vendor, who indicated that the costs for on-site staff were calculated at approximately \$90,000 per year. Given that the State's cost to provide this service internally would be in the vicinity of \$56,000 per year, it would be difficult for the State to save money in this arena, even if the vendor offered a significant reduction from the preliminary price.

Nevertheless, aspects of the initial pricing are attractive enough to warrant further investigation. Outsourcing offers the additional benefits of service level penalties and concrete performance measures – *management tools that are not viable with a completely cost-recovered internal service provider*. Correspondingly, our implementation plan asks the State to study this issue, comparing the costs and benefits of this option against other alternatives, before making a final determination as to the best approach to standardizing workstations and providing related services.

6. SERVER AND WORKSTATION ALTERNATIVES ANALYSIS

This section presents our server administration and workstation support labor cost analysis for the recommended and alternative scenarios.

SERVER ADMINISTRATION

The first chart below summarizes current server support levels and associated costs at the State.

Current Server Support									
	ITD FTE	ITD Cost	ITD cost per FTE	Agency FTE	Agency Cost	Agency cost per FTE	TOTAL FTE	TOTAL Cost	Overall Cost per FTE
Current server support									
Email administration	2.30	\$ 157,600	\$ 68,522	0.50	\$ 26,704	\$ 53,407	2.80	\$ 184,304	\$ 65,823
File/print administration	1.50	\$ 91,500	\$ 61,000	1.99	\$ 101,702	\$ 51,184	3.49	\$ 193,202	\$ 55,406
Other server administration	7.45	\$ 492,875	\$ 66,158	1.86	\$ 100,089	\$ 53,811	9.31	\$ 592,964	\$ 63,691
FTE Sum	11.25	\$ 741,975	\$ 65,953	4.35	\$ 228,495	\$ 52,564	15.60	\$ 970,470	\$ 62,222
Agency servers per support staff	22							Agency managed servers	94
ITD servers per support staff	36							ITD managed servers	409
Annual support cost	\$ 970,470							Current total of servers	503

The charts that follow summarize our analysis of scenarios for further cost reductions in server administration.

Scenario A leaves the servers under agency control as-is, and expects ITD to reduce the number of servers under its administration from 300 to 200. ITD staff are reduced by one, bringing the ratio of servers to staff within ITD to 30:1, which is more aligned with our typical experienced. This staff reduction delivers a potential savings of up to \$266K per year.

Scenario A									
Scenario A - reduce ITD server admin staff by 1, reduce number of ITD managed servers by 100									
	ITD FTE	ITD Cost	ITD cost per FTE	Agency FTE	Agency Cost	Agency cost per FTE	TOTAL FTE	TOTAL Cost	Overall Cost per FTE
Email administration	2.30	\$ 157,600	\$ 68,522	0.50	\$ 26,704	\$ 53,407	2.80	\$ 184,304	\$ 65,823
File/print administration	1.50	\$ 91,500	\$ 61,000	1.99	\$ 101,702	\$ 51,184	3.49	\$ 193,202	\$ 55,406
Other server administration	6.45	\$ 426,717	\$ 66,158	1.86	\$ 100,089	\$ 53,811	8.31	\$ 526,806	\$ 63,394
FTE Sum	10.25	\$ 675,817	\$ 65,933	4.35	\$ 228,495	\$ 52,564	14.60	\$ 904,312	\$ 61,952
Agency servers per support staff	22							Agency managed servers	94
ITD servers per support staff	30							ITD managed servers	309
Annual savings	\$ 66,158							Future total of servers	403

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Scenario B moves all of the remaining agency servers to ITD, reduces those servers by half through consolidation, and reduced total server admin labor by 3.35 FTE. The ratio of servers to support staff within ITD is brought down to 29:1. These changes yield a potential total savings of up to \$162K per year. Note that these savings correlate directly with the ratio of servers to ITD server administration staff. For instance, if this ITD function is staffed at 35:1, potential savings increase to approximately \$295K. As indicated in the Current Server Support chart, ITD presently staffs this activity with a ratio of 36 servers per administrator.

Scenario B

Scenario B - increase ITD server admin staff by 1, reduce number of ITD managed servers by 100, centralize remaining agency server support, reduce number of agency servers by 50% (=47)									
	ITD FTE	ITD Cost	ITD cost per FTE	Agency FTE	Agency Cost	Agency cost per FTE	TOTAL FTE	TOTAL Cost	Overall Cost per FTE
Email administration	2.30	\$ 157,600	\$ 68,522	0.00	\$ -	\$ 53,407	2.30	\$ 157,600	\$ 68,522
File/print administration	1.50	\$ 91,500	\$ 61,000	0.00	\$ -	\$ 51,184	1.50	\$ 91,500	\$ 61,000
Other server administration	8.45	\$ 559,033	\$ 66,158	0.00	\$ -	\$ 53,811	8.45	\$ 559,033	\$ 66,158
FTE Sum	12.25	\$ 808,133	\$ 65,970	0.00	\$ -	N/A	12.25	\$ 808,133	\$ 65,970
Agency servers per support staff	N/A					Agency managed servers			
ITD servers per support staff	29					ITD managed servers			
Annual savings	\$ 162,337					Future total of servers			
									356

We recommend Scenario B to:

- ◆ Maximize labor savings
- ◆ Provide the best opportunity for achieving additional efficiency in the future
- ◆ Shift agency focus away from infrastructure support
- ◆ Maximize savings in equipment replacement and maintenance costs as server counts are reduced.

WORKSTATION SUPPORT

The first chart below summarizes current desktop service support levels and associated costs at the State.

Current Desktop Services Support

Current Desktop Services	ITD FTE	ITD Cost	ITD cost per FTE	Agency FTE	Agency Cost	Agency cost per FTE	TOTAL FTE	TOTAL Cost	Overall Cost per FTE
Help Desk (Tier 1)	4.20	\$ 236,600	\$ 56,333	17.87	\$ 855,359	\$ 47,863	22.07	\$ 1,091,959	\$ 49,475
Workstation support (Tier 2)	1.80	\$ 108,000	\$ 60,000	20.03	\$ 937,790	\$ 46,817	21.83	\$ 1,045,790	\$ 47,904
Workstation administration	0.30	\$ 18,200	\$ 60,667	7.37	\$ 350,830	\$ 47,602	7.67	\$ 369,030	\$ 48,113
FTE Sum	6.30	\$ 362,800	\$ 57,587	45.27	\$ 2,143,979	\$ 47,358	51.57	\$ 2,506,779	\$ 48,607
Current count of PC's	7674								
Number of PC's per support staff	149								
Annual support cost	\$ 2,506,779								

The charts that follow summarize our analysis of scenarios for further cost reductions in Desktop Services.

Scenario A establishes a Tier 1 help desk in ITD with 10 additional FTE, freeing 19 agency FTE for redeployment or reduction. This delivers a potential net labor savings of up to \$176K per year.

Scenario A

Scenario A Summary		
Desktop Support Levels	Current	Future
Agency desktop support FTE	45.27	27.40
ITD desktop support FTE	6.30	19.00
TOTAL	51.57	46.40
PC's Per Support FTE	149	165
Desktop Support Costs	Current	Future
Agency desktop support	\$ 2,143,979	\$ 1,288,619
ITD desktop support	\$ 362,800	\$ 1,041,893
TOTAL	\$ 2,506,779	\$ 2,330,512
Savings (1.41 burden)	\$	176,266

Scenario B builds on this by centralizing workstation administration using automated tools. ITD adds 4.7 FTE, freeing up 9.5 additional agency FTE currently performing this function. Potential annual labor savings for this scenario are up to \$343K per year.

Scenario B

Scenario B Summary		
Desktop Support Levels	Current	Future
Agency desktop support FTE	45.27	20.03
ITD desktop support FTE	6.30	23.00
TOTAL	51.57	43.03
PC's Per Support FTE	149	178
Desktop Support Costs	Current	Future
Agency desktop support	\$ 2,143,979	\$ 937,790
ITD desktop support	\$ 362,800	\$ 1,225,193
TOTAL	\$ 2,506,779	\$ 2,162,983
Savings (1.41 burden)	\$	343,796

Scenario C adds centralization of Tier 2 support, adding 14.2 FTE to ITD and freeing up 19.8 agency FTE. Total potential net labor savings under this scenario are up to \$519K per year.

Scenario C

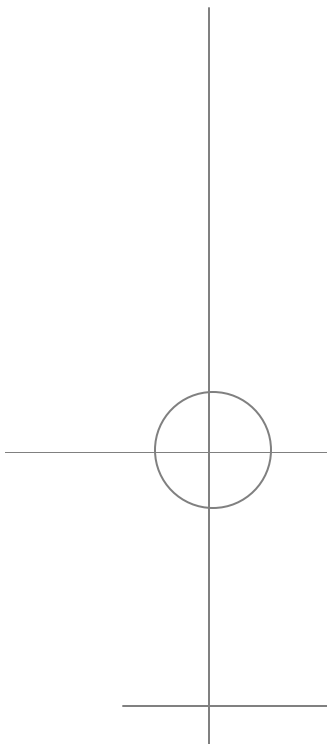
Scenario C Summary		
Desktop Support Levels	Current	Future
Agency desktop support FTE	45.27	0.00
ITD desktop support FTE	6.30	38.00
TOTAL	51.57	38.00
PC's Per Support FTE	149	202
Desktop Support Costs	Current	Future
Agency desktop support	\$ 2,143,979	\$ -
ITD desktop support	\$ 362,800	\$ 1,988,003
TOTAL	\$ 2,506,779	\$ 1,988,003
Savings (1.41 burden)	\$	518,776

We recommend Scenario C to maximize potential labor savings. We believe that the additional benefits of standardized desktop configuration, automated workstation updates, and a consistent state-wide service approach will, over the long term, allow State employees to use their computers more effectively in their daily work.

Note that ITD costs used to calculate potential savings assume a mixture of skill sets and experience levels. A burden rate of 1.41 was applied to assumed base salaries to arrive at fully-loaded costs. See Appendix B for additional detail. In addition, savings related to reduced administration and management effort are not included in the estimates. Finally, further savings may be realized, as a workstation-to-support-staff ratio greater than 200:1 is possible in a highly-standardized, well-automated environment.

C. COST IMPACTS

This section explains the potential cost savings associated with our recommendations, and describes some of the expenditures that may be required to accomplish them. The following exhibit presents estimated cost ranges for each initiative, divided into one-time and recurring costs.



Summary of Estimated Costs and Savings

Consolidate Provision of Desktop Services

Potential Annual Labor Savings:	\$519,000
Recurring annual expenditures for related goods and services estimated at:	\$60,000-\$260,000
One-time costs for software, hardware, phone systems, etc. estimated at:	\$160,000-\$1,010,000
<ul style="list-style-type: none"> ◆ Yields a net potential annual savings of \$259,000 to \$459,000 – depending upon the magnitude of the recurring costs and on how aggressively the State pursues reductions. ◆ The low-end estimate includes one-time costs of \$100,000 for phone system upgrades, along with some monies for procurement assistance and training. Associated recurring costs are likely to be at the upper-end of the range, as the State might have to lease help desk and remote management software. ◆ The high-end estimate includes system management software costs of \$360,000, phone system upgrades for \$150,000, and monies for software implementation assistance, training, and procurement. Software maintenance would make up the lion's share of the recurring costs. 	

Standardize Workstations

Potential Annual Savings:	Unknown
Recurring annual expenditures for workstation replacement estimated at:	\$2,950,000-\$3,680,000
One-time costs for consulting assistance estimated at:	\$20,000-\$430,000
<ul style="list-style-type: none"> ◆ Current annual workstation replacement spending is not known, so incremental investment over today's expenditures could not be calculated. Replacement costs presented are based on conservative estimates and may be lower than indicated. ◆ Assumptions include a total PC count for the State of 7,700. Replacement costs for PCs used in our estimates are \$750, \$1200, or \$2,500. Assumed refresh interval is a little over three years. ◆ The low-end workstation replacement figure assumes 25% are low-cost, 70% are mid-level, and 5% are high-end; while the upper end assumes 5% low-cost, 75% mid-level, and 20% high-end. ◆ One-time cost range assumes varying levels of outside assistance with workstation standards. 	

Continue Server Consolidation

Potential Annual Labor Savings:	\$162,000
One-time costs for consulting assistance estimated at:	\$0-\$20,000
<ul style="list-style-type: none"> ◆ Savings are predicated on how aggressively the State pursues reductions. Savings do not include anticipated hardware savings related to a reduction in total servers. ◆ Upper end of one-time cost assumes some consulting assistance in developing a consolidation approach and schedule. 	

Implement IT Governance Recommendations

Potential Annual Savings:	Unknown
Recurring annual expenditures for goods, services, and innovation funding:	\$200,000-\$340,000
One-time costs for software and services estimated at:	\$480,000-\$1,010,000
<ul style="list-style-type: none"> ◆ Savings are largely dependent upon the State's focus on cost containment. ◆ Low-end of one-time estimate assumes purchase of less expensive portfolio management software and little assistance with implementing the software or the governance recommendations. ◆ Recurring cost estimate reflects a potential range of software maintenance fees and innovation funding of \$137,000 at the low end and \$275,000 at the upper end. 	

Please refer to section H-3 for additional cost information. The remainder of this subsection discusses potential labor cost savings and how they might be captured, and the potential for equipment cost savings.

LABOR COST SAVINGS

Pacific Technologies utilized a staffing analysis model, incorporating input from state personnel, to quantify potential cost savings. The model assumes that savings from partial FTE reductions would be captured. On this basis, as explained in the previous section, **we project annual labor savings of up to \$519K from centralizing workstation support, and up to \$162K from additional consolidation of server administration.**

Capturing these savings will be challenging. To do so, ITD must charge the agencies for the costs of the newly-centralized services, so the agencies will be forced to cut staff (or find other savings) in order to pay the charges. Our analysis shows that, at most agencies, the value of staff time freed up from centralization will exceed the increased ITD charges. **But unless the agencies reduce their budgets in excess of the increased ITD charges, savings will not be realized.**

One potential alternative to this approach would be to increase ITD rates in line with the projected savings, and return the surplus to the general fund – in essence, run these service lines at a “profit.” But this would run counter to federal guidelines for retained earnings, creating many difficulties for grant-funded agencies. It would also create severe budget pressure on the agencies. Another alternative would be to cut agency budgets by the amount they currently spend on these services – similar to the approach taken by HB1505. This solution places a significant hardship on the agencies that rely on a small portion of an FTE for these services. For example, a 0.15 FTE reduction in force would be quite difficult to effect.

A key advantage to centralizing all of Desktop Services (rather than exclusively Tier 1) is that it reduces the number of small, fractional FTE’s that agency managers must contend with in reallocating labor. As noted earlier, we estimate that there are only about seven staff across the agencies who spend more than 50% of their time in Tier 1 support. But when Tier 2 and workstation administration are included, we find *30 agency staff who spend more than 50% of their time on Desktop Services* – making it much easier for agency managers to decide on position cuts needed to achieve savings targets.

Note that the previous discussion does not apply to ITD. A key benefit of centralizing these services is that, once they are under ITD’s control, efficiency gains *can* be captured. **Future ITD cost reductions should show up as rate decreases for the agencies.** The services should be actively performance managed to ensure that they are delivered with maximum efficiency.

The following chart models the potential impact of our Desktop Services recommendation on the agencies. It calculates ITD’s labor cost for providing Desktop Services and divides it among the agencies based on how many PCs they have. It then subtracts current agency costs to arrive at the net cost (or savings) for each agency.

For the 7,702 PCs shown here, the estimated per-PC labor charge from ITD would be approximately \$258 per year, or about \$22 per month. For each agency, we multiply the per-PC charge by the number of PCs to arrive at the number shown in the *Assumed ITD Desktop Services Cost* column. The figure in the *Current Agency Desktop Services Cost* column came from staffing information supplied to us by the agencies. The current cost attributed to the agencies in the *Allocation of Existing ITD Help Desk Labor* column represents an approximation. It allocates existing ITD Network Help Desk labor (currently included in per-device charges) to the agencies based on workstation counts. We would expect the current per-device charges to go down by a total of \$362,800 after these staff move to the new service desk. The final column shows the *net cost or (savings)* obtained by subtracting the total current costs from ITD charges.

**IT Organization
and Management
Study**

Chapter 3:
Recommendations

1. POTENTIAL COST SAVINGS

Agency	PC Count	Assumed ITD Desktop Services Cost	Current Costs		Total Current Costs	Net Cost (Savings)
			Current Agency Desktop Services Cost	Allocation of Existing ITD Help Desk Labor		
Office of Administrative Hearings	8	\$ 2,065	\$ -	\$ 377	\$ 377	\$ 1,688
Agriculture Department	103	\$ 26,586	\$ 12,938	\$ 4,852	\$ 17,790	\$ 8,796
Council on the Arts	6	\$ 1,549	\$ 2,156	\$ 283	\$ 2,439	\$ (890)
Attorney General	182	\$ 46,977	\$ 33,717	\$ 8,573	\$ 42,290	\$ 4,687
Bank of North Dakota	200	\$ 51,623	\$ 49,219	\$ 9,421	\$ 58,640	\$ (7,017)
Department of Commerce	66	\$ 17,036	\$ 32,324	\$ 3,109	\$ 35,433	\$ (18,397)
Department of Corrections	550	\$ 141,963	\$ 111,000	\$ 25,908	\$ 136,907	\$ 5,056
Children's Services Coordinating Committee	1	\$ 258	\$ -	\$ 47	\$ 47	\$ 211
Division of Emergency Management	49	\$ 12,648	\$ 9,210	\$ 2,308	\$ 11,519	\$ 1,129
Department of Financial Institutions	8	\$ 2,065	\$ -	\$ 377	\$ 377	\$ 1,688
Game and Fish Department	176	\$ 45,428	\$ 23,925	\$ 8,290	\$ 32,215	\$ 13,213
Department of Health	409	\$ 105,569	\$ 95,219	\$ 19,266	\$ 114,485	\$ (8,915)
Highway Patrol	182	\$ 46,977	\$ 48,301	\$ 8,573	\$ 56,874	\$ (9,898)
Historical Society	50	\$ 12,906	\$ 4,811	\$ 2,355	\$ 7,167	\$ 5,739
Housing Finance Agency	40	\$ 10,325	\$ 8,579	\$ 1,884	\$ 10,463	\$ (138)
Department of Human Services	1865	\$ 481,385	\$ 598,171	\$ 87,850	\$ 686,022	\$ (204,637)
Indian Affairs Commission	3	\$ 774	\$ 6,147	\$ 141	\$ 6,289	\$ (5,514)
Industrial Commission	77	\$ 19,875	\$ 24,269	\$ 3,627	\$ 27,896	\$ (8,021)
Insurance Commissioner	50	\$ 12,906	\$ 17,200	\$ 2,355	\$ 19,555	\$ (6,649)
Job Service	830	\$ 214,236	\$ 247,757	\$ 39,097	\$ 286,854	\$ (72,619)
Judicial Branch	485	\$ 125,186	\$ 87,711	\$ 22,846	\$ 110,557	\$ 14,629
Labor Department	11	\$ 2,839	\$ -	\$ 518	\$ 518	\$ 2,321
Land Department	18	\$ 4,646	\$ 6,183	\$ 848	\$ 7,031	\$ (2,385)
Legislative Council	268	\$ 69,175	\$ 51,338	\$ 12,624	\$ 63,962	\$ 5,213
Office of Management and Budget	104	\$ 26,844	\$ 37,147	\$ 4,899	\$ 42,045	\$ (15,202)
Mill and Elevator	42	\$ 10,841	\$ 15,720	\$ 1,978	\$ 17,698	\$ (6,858)
School for the Blind	30	\$ 7,743	\$ 22,500	\$ 1,413	\$ 23,913	\$ (16,170)
Parks and Recreation	8	\$ 2,065	\$ 27,805	\$ 377	\$ 28,182	\$ (26,117)
Public Employees Retirement System	33	\$ 8,518	\$ 14,741	\$ 1,554	\$ 16,295	\$ (7,777)
Department of Public Instruction	141	\$ 36,394	\$ 48,110	\$ 6,642	\$ 54,752	\$ (18,358)
Public Service Commission	50	\$ 12,906	\$ 10,965	\$ 2,355	\$ 13,320	\$ (415)
Retirement and Investment Office	21	\$ 5,420	\$ 5,155	\$ 989	\$ 6,144	\$ (723)
Secretary of State	28	\$ 7,227	\$ 23,907	\$ 1,319	\$ 25,226	\$ (17,999)
Tax Department	196	\$ 50,591	\$ 4,243	\$ 9,233	\$ 13,476	\$ 37,115
Department of Transportation	943	\$ 243,403	\$ 367,916	\$ 44,420	\$ 412,336	\$ (168,933)
Vocational and Technical Education Board	34	\$ 8,776	\$ 6,061	\$ 1,602	\$ 7,663	\$ 1,113
Water Commission	115	\$ 29,683	\$ 24,253	\$ 5,417	\$ 29,670	\$ 13
Workforce Safety and Insurance	320	\$ 82,597	\$ 65,278	\$ 15,073	\$ 80,351	\$ 2,246
TOTAL	7702	\$ 1,988,003	\$ 2,143,979	\$ 362,800	\$ 2,506,779	\$ (518,776)

Note that while this represents a state-wide efficiency improvement, some agencies would not save money. Smaller agencies simply don't have the staff to support their workstations, so their current costs are almost nil. Other agencies have users who are largely self-supporting and who place little demands on their IT staff.

These numbers will need to be refined as centralization proceeds. While we believe the overall analysis and associated conclusions are sound, some of the detail is certain to contain errors that will need to be corrected in the process of calculating the final PC labor charge. In addition, some agencies did not respond to our data request and will need to be included in the final tally. Finally, the estimated ITD charges do not include management, overhead, or costs related to help desk software.

EQUIPMENT REPLACEMENT COST SAVINGS

We did not include estimates of potential savings from equipment replacement in our analysis because the State does not track these costs well enough at the agency level to provide credible data. However, some rough estimates are possible based on the number of servers and workstations used by the State. **We recommend that North Dakota begin tracking these replacement costs as part of their move to performance measurement.**

The State has roughly 7,700 PC workstations. If we assume an average costs of approximately \$1,000 per workstation (including personal productivity software, monitor, configuration, delivery, and

installation) and use ITD's current recommended replacement cycle of 4 years, the State makes an expenditure of approximately \$1.9M per year. Efficiently centralizing desktop support would require **moving the state to a single-vendor, managed desktop environment**. This should deliver lower total cost of ownership. Estimating this improvement at 10% over the life of a PC, **could save \$190K per year**.

Centralizing the State's servers will allow ITD to consolidate similar functions onto fewer servers. Our analysis suggests that about 150 servers will be eliminated. Assuming these have a replacement cycle of 5 years and a replacement cost of \$5000 each, **the State could save about \$150K per year**.

2. POTENTIAL EXPENDITURE REQUIREMENTS

Centralizing workstation support will require ITD to dedicate approximately 38 FTE to this activity, although five of these positions are assumed already exist. It will also require management, likely a Desktop Services Manager and two FTEs of supervision. These staff will need facilities and computers. In addition North Dakota must invest in help desk software and automated desktop management tools.

Completing the server consolidation may also require the purchase of some new, higher-capacity servers to replace multiple smaller ones. Additionally, there will be costs of relocating the servers, along with moving applications and data to the new platforms.

Section G of this report describes the projects needed to accomplish our recommendations. These include cost estimates which encompass the hardware, software, installation, consulting, training, and other items needed. Please refer to this section for more specific expenditure figures.

D. ORGANIZATIONAL IMPACTS

This section summarizes the position changes needed at the agencies and ITD, recommends changes to the ITD organizational structure, discusses roles and responsibilities under the new service delivery model, and highlights attendant human resources and management issues.

1. IMPACTED POSITIONS

The following describes impacts to both ITD and the agencies associated with our recommendations.

ITD IMPACTS

The primary staffing impact of our recommendations will be the creation of a Service Desk division within ITD to handle all aspects of help desk, workstation support, and workstation administration services. Fully implemented, this will result in a net increase of approximately 33 FTEs, plus two FTEs of additional management. Skills needed in each of these areas are summarized below:

- ◆ **Help desk** staff will need proficiency in solving customer problems over the telephone and using remote access software, with a focus on either quick solution or dispatching the appropriate Tier 2 technician
- ◆ **Workstation support** staff may be co-located at customer agency sites, and must be skilled at on-site hardware and software problem resolution; they must also possess strong customer service abilities
- ◆ **Workstation administration** staff must be skilled in the use of centralized desktop management tools to administer access, update virus protection, keep configurations current, etc.

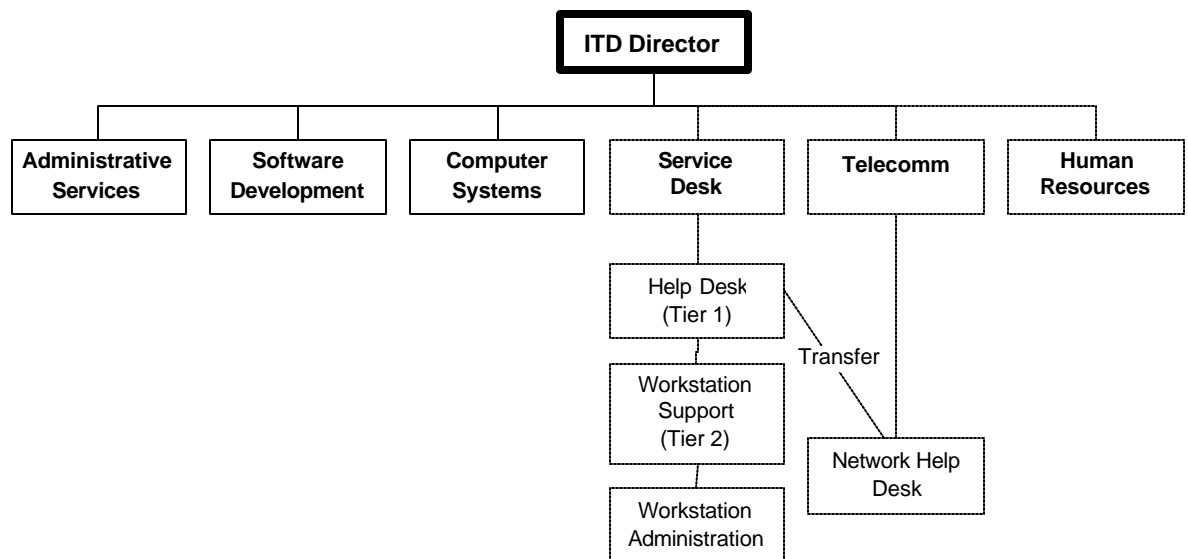
Our model assumes that ITD adds one FTE of server administrator effort to support a staffing ration of 29 servers per administrator. It may also be necessary for help desk staff to undergo security clearance checks as a prerequisite to accessing some agency systems.

AGENCY IMPACTS

Our recommended approach leaves staff cuts to agency discretion – commensurate with Desktop Services charges. Most likely the agencies will look at staff currently performing server administration and workstation support when searching for positions to eliminate. Alternatively, they may come from adjustments to other programs or services. *This choice is ultimately up to agency management.* In addition to facing difficult staffing decisions, the agencies may experience some service level degradation – at least over the short term.

2. FUTURE ORGANIZATIONAL MODEL

The diagram below depicts recommended changes to the ITD organizational structure. We recommend the creation of a Service Desk group at the director level, with the functions shown beneath. Note that this would entail transfer of the Network Help Desk (currently 4 FTE) from the Telecommunications group to the new Service Desk division.



3. ROLES AND RESPONSIBILITIES

The table below recommends the target provider for each IT service, and briefly notes the associated responsibilities. **These responsibilities will migrate to the defined “target provider” over time – in some instances ITD may not fully assume services for two to three years.** Please see Section G of this report for a discussion of staffing and funding transitions, and refer to the Glossary in Appendix A for definitions of each IT function.

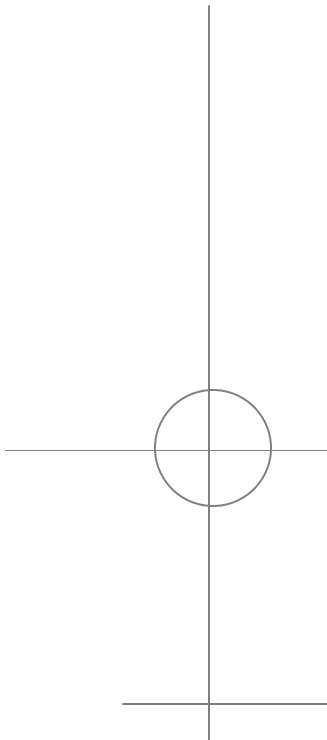
IT Function	Target Provider	Notes
Customer Services		
Help Desk (Tier 1)	ITD	Tier 1 staff will be centrally located in ITD, Tier 2 staff will be co-located as needed in agency buildings and remote offices
Workstation support (Tier 2)		
End user application support	Agencies*	Agencies will continue to support and train their own staff in the use of agency-specific applications
Training		
System Services		
Network connectivity	ITD	Already largely centralized, remaining effort should migrate to ITD
Email administration	ITD	Partially centralized by HB1505, complete centralization is key to achieving cost savings originally envisioned
File/print administration		
Other server administration		
Workstation administration	ITD	Will be centrally located in ITD, using managed desktop tools to administer configurations and upgrades
Storage management	ITD	Will be included in ITD’s file/print service, should disappear from agencies over time
Data center operations	Mixed	Will move to ITD as agencies relinquish servers and retire obsolete platforms
Database administration	Mixed	Remains at agency discretion, but ITD’s offering may become more attractive as centralization proceeds
Security administration	Mixed	Agencies are responsible for application and database security (for those databases they administer) but all other aspects of security move to ITD
Telephone systems support	Mixed	Will remain at agency discretion
Business Application Services		
ConnectND	ITD	End-user support for this will be included in ITD’s workstation support offering
Agency applications	Agencies*	Will continue to be at agency discretion, with ITD largely acting as a contract resource provider
IT Administration & Planning		
Strategic planning	Mixed	See Section E of this report for recommended changes
Research and development	Mixed	Innovation continues to be encouraged both at ITD and the agencies
Disaster recovery management	Mixed	Not much done now – needs agency involvement, but ITD could provide structure and oversight
Asset management	ITD	Should become almost entirely an ITD responsibility with infrastructure standardization and managed desktop
IT procurement		
Project management	Mixed	Will remain at agency discretion
Administrative support	Mixed	Balance will shift slightly to ITD with centralization, but overall levels will remain about the same
Departmental management		

*While ultimately responsible, agencies may choose to contract with ITD to provide this effort

4. HUMAN RESOURCES AND MANAGEMENT ISSUES

To assure the success of the changes recommended in this report, ITD and the agencies must address several significant issues, outlined as follows:

- ◆ **ITD must build a new Desktop Services capability – with strong and credible customer support skills**
To date, ITD has concentrated on infrastructure support and application development. These are vital functions, but not ones that require daily customer contact. Centralizing desktop services support will require staff who both enjoy and are proficient at interacting with customers, and who can work effectively and competently as part of the ITD team even when placed in the field.
- ◆ **Agencies must “let go” of services provided by ITD**
While our recommended approach is designed to give agencies maximum flexibility in looking for cost savings to pay for the new workstation support charges, it will serve the State’s best interests as a whole if they look first to their staff who have been supporting their workstations. This will help ensure that cost savings are captured, and will also provide a pool of IT staff with agency experience that ITD can hire for its new position needs.
- ◆ **ITD and the agencies must agree on appropriate performance measures**
For both server administration and workstation support, ITD will need to track performance in ways that the agencies can understand and respond to. This will require the crafting of service level agreements with targets that link to agency business goals.
- ◆ **ITD must ensure that long-term efficiency gains translate into rate reductions**
We expect that, as IT services are centralized, over time, ITD will find additional ways to automate services and reduce the need for IT staff. As this happens, ITD must commit to making the associated staff reductions, and ultimately reducing rates charged to the agencies.
- ◆ **Have SITAC appoint a transition team to “own” the transition process**
Transitioning to the new service model and rate structures will require a significant amount of time and effort. While ITD will assume much of the responsibility for seeing this through, agency cooperation is a must. Accordingly, we recommend identifying a cross-agency team as the formal “owner” of the transition process, responsible for the key decisions that must be made along the way.



E. GOVERNANCE RECOMMENDATIONS

This section presents governance recommendations aimed at improving existing processes and better positioning the State for achieving greater return on its IT investments. Our recommendations provide the State with a model for making rational, informed prioritizations and decisions regarding information technology.

The section presents our recommendations as follows:

1. Recommended Governance Model
2. Roles and Responsibilities
3. Supporting Tools
4. Performance Measures

1. RECOMMENDED GOVERNANCE MODEL

Pacific Technologies' governance recommendations focus on improving IT decisions across the State. The changes refine specific roles for existing IT decision makers and provide explicit linkages with the existing budget processes surrounding IT.

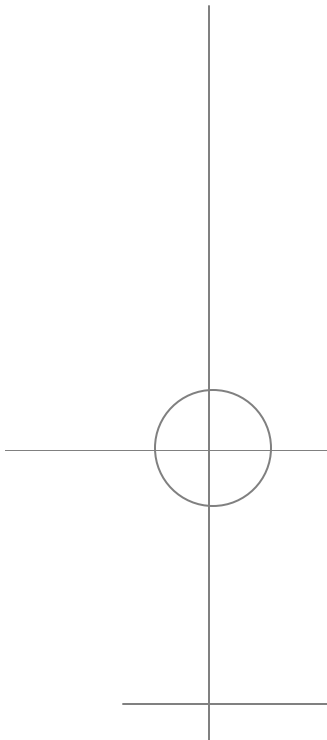
Three primary objectives drove the creation of these models:

- ◆ **The need for a consistent, structured, business-based approach, with associated supporting tools, to making informed IT investment decisions**
- ◆ **A desire to improve mechanisms to support cost containment**
- ◆ **The requirement for meaningful state-wide management and reporting views of IT initiatives**

The following subsections present two process models:

- ◆ IT Project Investment Review
- ◆ SITAC Evaluation Criteria Development

Detailed process descriptions follow the models.



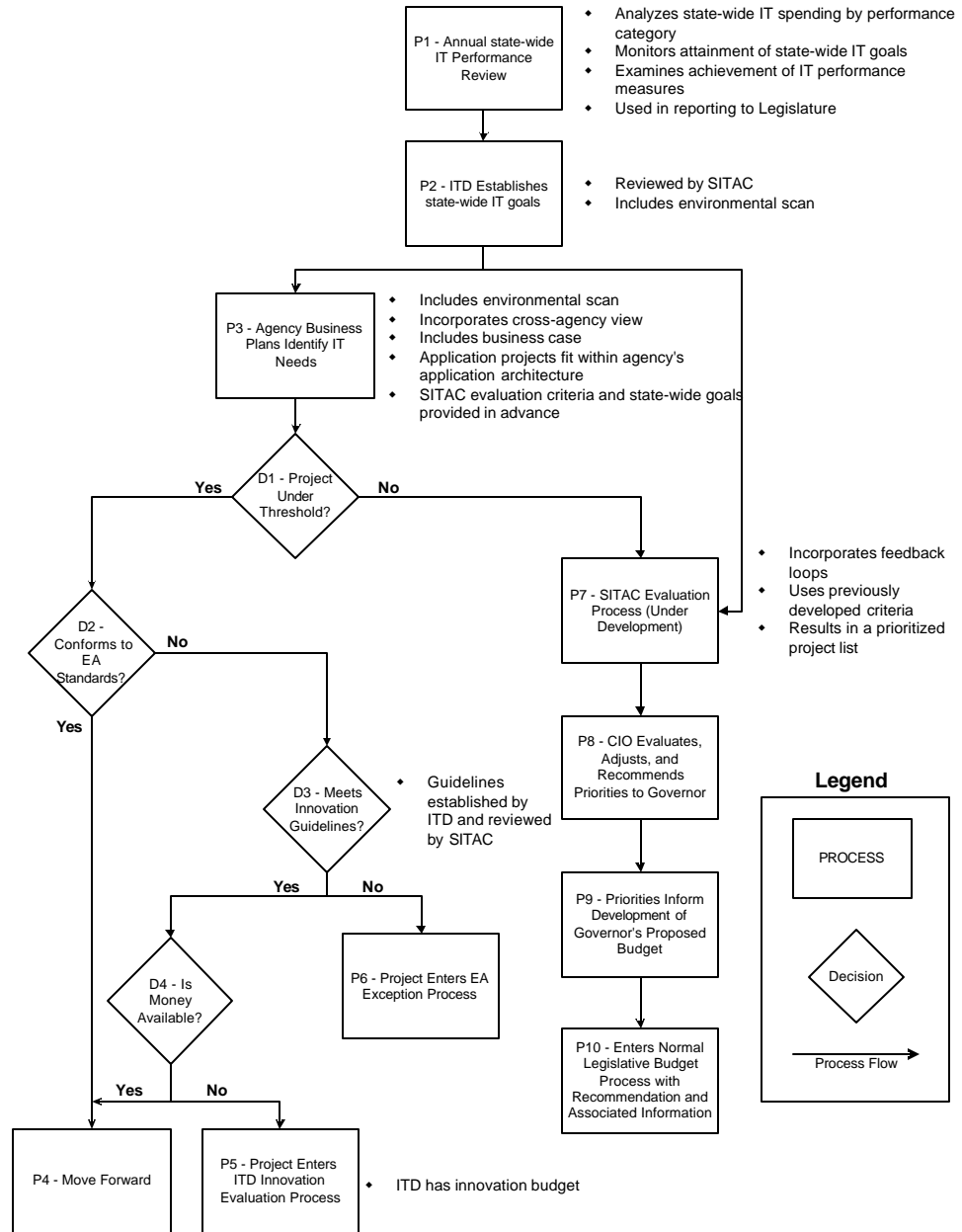
PROCESS MODELS

The model below presents Pacific Technologies' recommendations for IT project investment governance. It builds upon several initiatives already underway, including the enterprise architecture project and the SITAC's movement toward a portfolio management approach to IT asset management.

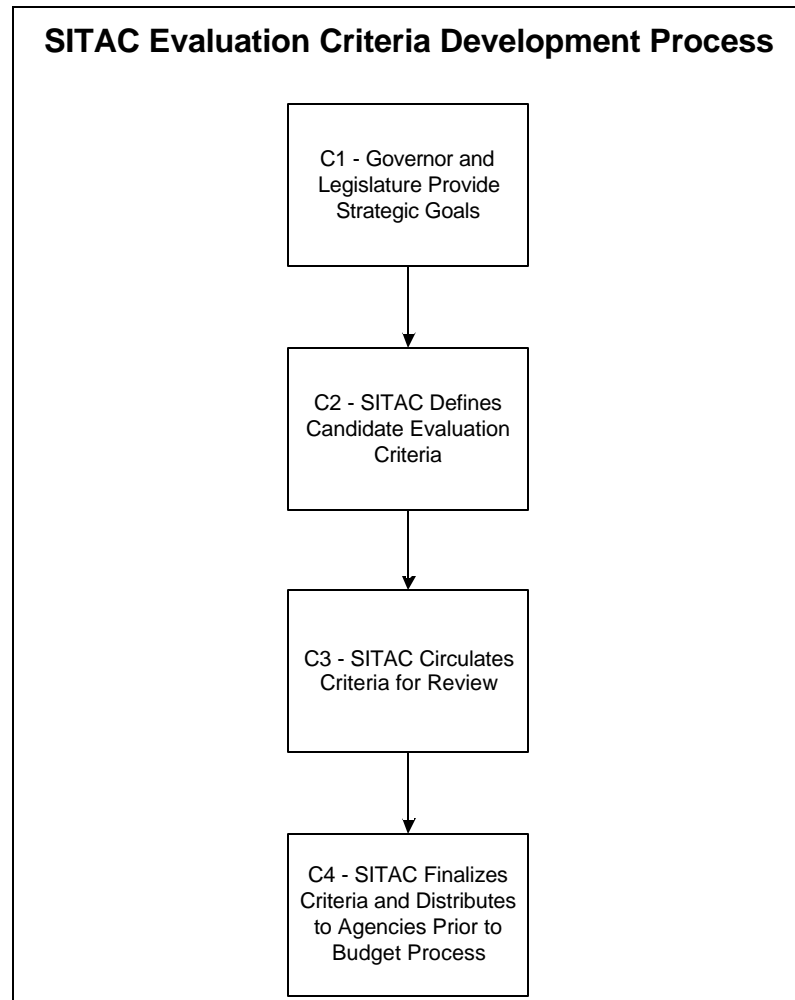
IT Organization and Management Study

CHAPTER 3: Recommendations

IT Project Investment Review



The following model depicts the recommended process for developing the evaluation criteria to be used by SITAC:



PROCESS DESCRIPTIONS

The following narrative describes the specific processes in each model:

IT PROJECT INVESTMENT REVIEW PROCESS

This process outlines the evaluation and prioritization path IT initiatives at the State will follow – moving from agency-based governance through the legislative process.

P1 - Annual State-wide IT Performance Review

ITD will conduct an evaluation of past performance-to-plan for IT initiatives and efforts over the previous year. Generally, this evaluation reviews baseline performance in spending, effort, and project completion. It will also look at performance with regard to targets, trends, and alignment with agency and state-wide goals.

P2 - ITD Establishes State-wide IT Goals

Based on an overall strategic direction from policy makers, and informed by an environmental scan of industry trends and efforts in other states and jurisdictions, ITD will establish state-wide IT goals for the next year. SITAC will review and recommend refinements to these goals.

P3 - Agency Business Plans Identify IT Needs

This step assumes that a significant amount of planning occurs in the agencies prior to initiatives entering the State-wide process. Currently agencies are required to complete IT plans, but no similar requirement exists for business plans. We recommend implementing a state-wide business planning approach that includes an IT component with specific linkages to agency IT plans. The goal is to ensure that business needs are being met by technology – and to ensure that technology expenditures have a business-based purpose.

These efforts will require agencies to conduct an environmental scan at an agency level, taking into account new and evolving business goals, external mandates and requirements, and external activities (both in other agencies as well as in similar states). Preliminarily-identified initiatives should receive further analysis in a business case. Part of this evaluation should include the state-wide goals and SITAC evaluation criteria. The final agency IT plan should include a prioritized set of proposed IT initiatives and associated business cases.

D1 - Project Under Threshold?

Projects under a monetary threshold defined by SITAC need not go through a broader project evaluation process. Accordingly, this decision point breaks the process into two paths – one for the smaller projects, and one for all other projects.

D2 - Conforms to EA Standards?

Projects under the threshold must be evaluated for compliance with the standards developed through the EA process. Projects that are within the standards move forward, projects that are outside of existing standards move to an innovation evaluation process.

D3 - Meets Innovation Guidelines?

Standards will never completely keep up with advances in technology. While most public sector organizations are relatively conservative in their adoption of technology, there are times when innovative solutions merit consideration. To help the State foster this process, and at the same time provide some necessary structure, ITD will be responsible for maintaining a SITAC-informed set of criteria for evaluating potential projects for innovation funding. The criteria will establish specific characteristics of an acceptable project (e.g., ability to demonstrate a concrete ROI in a reasonable timeframe, using technologies that have been successfully implemented in other jurisdictions, etc.). This step in the overall process determines whether the project conforms to those specifications.

D4 - Is Money Available?

This decision point splits the process – if an agency has funds available, the initiative moves forward. If not, the project moves into an innovation project evaluation.

P5 - Project Enters ITD Innovation Evaluation Process

ITD will maintain a fund to help innovative projects get off the ground. This process evaluates the merits of the project and, if approved, will provide some level of funding for the project.

P6 - Project Enters EA Exception Process

Projects that do not conform to either the EA standards or the criteria of the innovation list move into the EA exception process.

P7 - SITAC Evaluation Process (Under Development)

Projects not under the threshold move to the SITAC for evaluation. SITAC is currently working to develop a detailed approach for handling these activities (e.g., portfolio management). The resulting sub-process should be iterative, incorporating feedback loops and allowing for complete and open communication. The process will leverage the business case already developed for each initiative and evaluate it using the predetermined set of criteria (see the SITAC Evaluation Criteria Development Process below). The output of this process is a recommended prioritized project list.

P8 - CIO Evaluates, Adjusts, and Recommends Priorities to Governor

In this step, the CIO fulfills his or her statutory responsibility in evaluating the SITAC recommendations, and after making refinements, forwards his or her recommendations to the Governor. In some respects, this is a *pro forma* exercise; the CIO is heavily involved in the SITAC

evaluation process. If there is a disagreement, the CIO still maintains the final recommendation authority.

P9 - Priorities Inform Development of Governor's Proposed Budget

The CIO/SITAC prioritized set of projects are now used as planning tools in developing the Governor's recommended budget.

P10 - Enters Normal Legislative Budget Process with Recommendation and Associated Information

At this point, the projects enter the regular budget process. The fundamental change at this level is that decision makers now have a set of priorities established by a cross-enterprise group, as well as a wealth of supporting detail and summary data (refer to subsection 3, Supporting Tools, for additional detail) by which to evaluate those priorities.

SITAC EVALUATION CRITERIA DEVELOPMENT PROCESS

This process develops the criteria used by SITAC in the IT Project Investment Review activities.

C1 - Governor and Legislature Provide Strategic Goals

The State's strategic goals should provide a basis for the SITAC evaluation criteria. Accordingly, this task elicits perspectives from the key decision makers to serve as an input for criteria development.

C2 - SITAC Defines Evaluation Criteria

Using the strategic goals provided by the Governor and Legislature as a basis, along with their understanding of specific agency goals, SITAC identifies its evaluation criteria. These criteria will apply to each project evaluated to ensure initiatives align with State business and IT goals, as well as make fiscal and technological sense.

C3 - SITAC Circulates Criteria for Review

In this step, SITAC elicits comments and feedback from agencies and policy makers on the criteria to ensure they truly align with strategic goals and provide a fair and reasonable set of tools for evaluating IT proposals.

C4 - SITAC Finalizes Criteria and Distributes to Agencies Prior to Budget Process

SITAC incorporates feedback from the review process and refines the criteria and principles as appropriate. SITAC will distribute them to the agencies prior to the budget process.

2. ROLES AND RESPONSIBILITIES

The processes presented in the previous section assume specific roles and responsibilities for the following participants:

- ◆ Agencies
- ◆ OMB
- ◆ SITAC
- ◆ CIO
- ◆ Governor
- ◆ Legislature

The following provides related descriptions for each participant.

AGENCIES

Agencies identify IT projects to support their business needs. They conduct initial project evaluations using a standard business tool, and, to the degree possible, rely on state standards in defining their projects. For large projects, agencies will develop a business case with the assistance of OMB and ITD, using a standardized approach and associated tools and templates. Agencies will take into account state-wide goals and SITAC evaluation criteria. They will serve as sponsors for their project and work with SITAC throughout the evaluation process.

OMB

OMB provides support for financial analysis and review throughout the process – from initial business case development through legislative review.

ITD

ITD serves as a technical resource for all parties. ITD is responsible for creating and maintaining the innovation guidelines, with input from SITAC. ITD also administers the innovation technology fund and the evaluation process for providing innovation dollars. ITD provides administrative and logistic support to the SITAC, and is responsible for collecting, collating, analyzing and presenting IT performance data.

SITAC

SITAC serves as the key advisory group in the decision model. Using input from all interested parties, it establishes IT project evaluation criteria. It also provides input on the innovation guidelines. Primary responsibilities involve evaluating proposed IT projects and identifying a recommended prioritization of those projects to the CIO.

CIO

The CIO has final responsibility for recommending IT projects and priorities to the Governor. He or she is also responsible for overseeing ITD through their efforts as described above. The CIO is a member of the SITAC and is instrumental in providing input to its agenda.

GOVERNOR

The Governor accepts, evaluates, and incorporates as appropriate the priority recommendations from SITAC and the CIO. He or she also provides input into developing and refining evaluation criteria, including setting strategic goals.

LEGISLATURE

The Legislature has its normal role in molding the State budget, including IT projects. It also provides input into developing and refining evaluation criteria, including identifying the State's strategic goals.

3. SUPPORTING TOOLS

A key component of the governance recommendations is a move toward a more consistently structured IT decision-making process at the State. In support of this effort, the State will need to develop a set of supporting tools, including:

- ◆ Business Case Template
- ◆ Evaluation Criteria
- ◆ IT Report Card
- ◆ Business Plan Template

The following provides a summary description of each recommended tool.

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BUSINESS CASE TEMPLATES

ITD has made significant progress in developing guidelines for large-project business cases. It includes key elements, such as how to identify the business requirements, examine the cost implications of the proposal, identify and mitigate risk, and establish agency commitment.

The next step is developing the associated templates – both narrative documents and spreadsheets – that will provide standardized tools for establishing the business justification for an IT initiative.

In addition, the templates must also incorporate performance measurements and associated goals, as well as a measurement plan for identifying a baseline and post-implementation success. They will also need to incorporate the current SITAC evaluation criteria and a provision for ensuring compliance with IT standards.

EVALUATION CRITERIA

As described in the Section E-2, SITAC will be responsible for identifying evaluation criteria for IT projects prior to each budget cycle. These criteria will be shaped largely by state policies and goals, but they should be clear, concise, and easily measured. The more tangible and clear they are, the easier it will be for agencies to present their business cases and the more likely self-selection may occur, reducing the number of inappropriate candidates for SITAC to review.

IT REPORT CARD

State decision makers have grappled with their ability to effectively evaluate North Dakota's IT expenditures – to distinguish sound expenditures from those that may not be in the State's best interest. To address this issue, Pacific Technologies recommends that the State develop an IT Report Card that summarizes State IT expenditures and overall performance.

The report card should:

- ◆ Provide a set of performance measures outlining IT efforts
- ◆ Summarize IT expenditures across a variety of dimensions (e.g., by type of expenditure, by agency, etc.)
- ◆ Present life-to-date performance of major projects (e.g., schedule and budget information, as well as business goal attainment for recently completed projects)
- ◆ Outline attainment of state-wide IT goals

Section E-4 that follows below provides more specific performance measurement recommendations.

BUSINESS PLAN TEMPLATE

To support the goal of linking IT initiatives to agency mission and objectives in a easily discernable way, the State will need to create a standardized tool for capturing agency business plans. This could be a simple template developed by OMB that identifies agency strategies, missions, goals, and objectives for the coming biennium. Conversely, the State could use this as an opportunity to move toward performance budgeting and management, requiring that agencies tie all efforts – IT and otherwise – to specific, measurable goals and objectives.

This by no means represents a comprehensive set of tools the State could use to support its decision processes. Software is emerging that could help automate the portfolio management and prioritization process across the State. Once the State has implemented these recommendations and begins to refine the approach, ITD and SITAC should explore such tools with an eye toward making continued improvements to IT governance.

4. PERFORMANCE MEASUREMENT

Pacific Technologies recommends that the State significantly increase its performance measurement efforts to improve insight into IT operations and expenditures

Performance-based decision making relies heavily on data analysis. The effort required to gather and analyze this data can be significant, and should not be underestimated. However, such analysis is required to truly understand the *value* being achieved from IT investments.

To put in place a process for performance measurement, the State will need to identify areas for measurement, expected or desired targets for those metrics, and a method for collecting the data. The following outlines Pacific Technologies specific recommendations in that regard.

Broadly speaking, performance measures fall into three categories:

- ◆ **Input** – Track resources used in producing an output or an outcome
- ◆ **Output** – Calculate or record the activity that occurred
- ◆ **Outcome** – Indicate progress toward achievement of business goals

We recommend that the State emphasize development of outcome measures, as they relate most directly to accomplishment of business and policy objectives.

AREAS FOR MEASUREMENT

Pacific Technologies recommends that the State implement performance measures in the following four categories:

- ◆ IT Customer Satisfaction
- ◆ IT Financial and Management Performance
- ◆ IT Project Performance
- ◆ Consolidation Transition Performance

IT CUSTOMER SATISFACTION

These measures help the State understand how well Desktop Services meet customer needs. Metrics for customer-centric services (such as help desk) also help service providers and customers understand service trends and areas of concern. Service level target commitments must be determined in a collaborative effort between customers and IT staff to ensure measures address customer demand – and are attainable. Suggested measures include:

- ◆ Customer satisfaction survey (expanding on what is currently conducted by ITD)
- ◆ Tier 1 and Tier 2 help desk metrics:
 - Percent of problems resolved by Tier 1 staff
 - Percent of problems responded to within a fixed time frame (e.g., 30 minutes)
 - Percent of Tier 2 problems resolved within a fixed time frame of the initial Tier 1 call (e.g., 2 hours)
 - IT incidents per workstation
 - Cost per call

If Service Desk implements a phone system that supports call queuing and related features, additional measures might include:

- ◆ Percent of phone calls answered within 20 seconds
- ◆ Call abandonment rate

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IT FINANCIAL AND MANAGEMENT PERFORMANCE

While the previous set of measures provide qualitative insight into service delivery, the financial and management measures help decision makers take a broad look at IT service delivery and efficiency.

Suggested measures include:

- ◆ IT Labor Expenditures by category (as defined by Pacific Technologies):
 - Business Application Services
 - Customer Services
 - System Administration
 - IT Administration and Planning
- ◆ Goods and services expenditures:
 - Software licenses
 - Hardware
 - Contract labor
- ◆ IT operating budget as a percentage of total state-wide operating budget
- ◆ IT expenditures per citizen
- ◆ PC to PC-support-staff ratios
- ◆ Server to server-administration-staff ratios

IT PROJECT PERFORMANCE

In addition to increased mid-project oversight, Pacific Technologies recommends increased data gathering for completed projects. Information on past project performance is critical to identifying “lessons learned” and highlighting whether project promises are kept – or broken. Suggested measures include:

- ◆ Percentage of projects completed on-time
- ◆ Percentage of projects completed within budget
- ◆ Percentage of planned business outcomes attained after one year’s time

CONSOLIDATION TRANSITION PERFORMANCE

The measures presented in the previous paragraphs are expected to be evaluated on an ongoing basis – most likely annually. Additionally, Pacific Technologies recommends that the State conduct performance measurement on a quarterly basis to track progress toward completing the recommendations in this report. Suggested measures include:

- ◆ Percentage of defined primary tasks of the implementation plan completed (refer to section H for additional detail)
- ◆ Percentage of Desktop Services delivered centrally (by FTE)
- ◆ Percentage of workstations deployed with one of the state-wide standard configurations
- ◆ Total number of servers
- ◆ Percentage of servers managed centrally

The following outlines additional considerations related to performance measures – desired targets and collection methods.

DESIRED TARGETS

In establishing the performance measures, the State must:

- ◆ Define performance targets (e.g., ratio of workstations to support-staff-FTE's, etc.)
- ◆ Capture baseline measures *now* to ensure that an accurate picture of current performance exists

METHOD FOR COLLECTING DATA

If possible, the State should use consistent coding in ConnectND to facilitate collection and analysis of:

- ◆ Labor cost measures
- ◆ Goods and services measures
- ◆ Overall expenditure measures

Other measures will require manual data collection, or the aggregation of data from a variety of other systems. We expect some evolution of these measures over time. Additionally, the State most likely will create more streamlined data collection and reporting processes based on lessons learned.

F. ADDITIONAL RECOMMENDATIONS

Projects of this nature provide the consultant with broad exposure to IT issues and concerns beyond the immediate scope of the engagement. This section offers Pacific Technologies' related recommendations, including the following:

1. Complete the EA process
2. Conduct a similar consolidation study within the universities
3. Perform an application cost analysis
4. Implement an innovation fund

1. COMPLETE THE EA PROCESS

Pacific Technologies recommends that the State re-focus its attention on EA by applying adequate resources and increasing management attention to ensure that the process completes in a timely manner. Given the *de facto* standardization that will occur as servers are further consolidated and the workstation environment is brought under control, we suggest that specific attention be paid to application-related standards.

The final standards should move the State toward a significantly more limited set of application development environments, databases, and related tools. This will align the State with best practices, increase opportunities for data sharing, and allow the State to standardize its hardware environments more effectively. Eventually, it could also provide modest cost savings through license and tool cost reductions.

The State should also ensure this process includes identifying governance mechanisms for keeping the standards up-to-date.

Once standards are defined, the much more difficult (and expensive) process of implementing these standards will begin. Workstation standardization is presented in the previous section. Additional efforts regarding servers and application development will require longer-term transition plans, but are likely to provide similar long-term benefits through better interoperability, improved management, reduced staff requirements, more effective purchasing, and lower training costs.

2. CONDUCT A SIMILAR CONSOLIDATION STUDY WITHIN THE UNIVERSITIES

The State's university system was excluded from this exercise – an appropriate approach given their size, general autonomy, and extremely different mission. However, within the universities, similar opportunities and issues are likely to exist, though successful solutions for that environment may be very different than what is presented above.

Accordingly, Pacific Technologies recommends that the universities conduct a similar exercise aimed at improving overall efficiency of IT expenditures and IT governance. The Roundtable sessions and report provide a starting point, broadly moving higher education toward performance and accountability measurement practices. This recommendation also suggests the university system provide additional performance management efforts specifically targeted at IT.

3. PERFORM AN APPLICATION COST ANALYSIS

Pacific Technologies found that the State has limited insight into its application portfolio and associated costs – even though it accounts for approximately 50% of the IT operating labor. This recommendation calls for the State to gather baseline data on application spending, labor effort, expected life, and asset value. Specifically, North Dakota should conduct a survey of each agency, gathering a listing of each application, associated current and historical spending, business use, and labor requirements.

This information would then be consolidated to provide a summary of the State's application environment. It could serve as a starting point for identifying potential areas for cost savings and/or improved efficiencies. If an analysis of this data indicates significant duplication of functions or applications, the State should conduct a further study to examine the practicality of having agencies share applications. Once the EA process finalizes application standards, this information will also identify for State decision makers where future investment will be required.

This process could also provide the State with the opportunity to gather additional information, including a listing of the State's data assets and associated storage mechanisms. This information then could be used to improve data sharing between agencies.

4. IMPLEMENT AN INNOVATION FUND

With the goal of fostering the advancement of technology at the State of North Dakota, Pacific Technologies recommends the establishment of an innovation fund, outlined earlier within the context of future IT governance enhancements. The fund would be available to provide agencies incentives to pilot – on a small scale – new technologies that might be useful to the State on a broader basis at some point in the future. This will provide state IT staff an early experience with skills it may need in the future and reduce the likelihood that larger expenditures are made on ill-suited, untested technologies.

To implement this fund, the State will need to:

- ◆ Seed the fund with start-up monies
- ◆ Identify a mechanism (such as captured cost savings) for replenishing these funds as they are spent

ITD will use a set of pre-established criteria to allocate these funds to qualifying projects, as described in this study's governance recommendations.

G. TRANSITION APPROACH

This section describes the staffing and management transitions needed to accomplish the study's four major recommendations:

1. Consolidate Provision of Desktop Services
2. Standardize Workstations
3. Continue Server Consolidation
4. Improve IT Governance Processes

1. CONSOLIDATE PROVISION OF DESKTOP SERVICES

STAFFING TRANSITIONS

The key decision regarding staffing surrounds whether or not these positions should be provided internally by ITD or by an outsourced provider. If the selected approach recommends the creation of ITD workstation support positions, our implementation plan (Section H of this chapter) suggests a phased approach, with a few pilot agencies going first. To make this transition as smooth as possible, we recommend that ITD and the agencies agree on a plan with specific dates for accomplishing the following steps:

- ◆ ITD develops estimated workstation rates and per-agency charges
- ◆ Agencies determine which positions will be eliminated to pay for the workstation charges
- ◆ ITD posts the new position openings, with preferential treatment for staff laid off from the agencies
- ◆ ITD announces position hires

Note that this assumes the majority of agency workstations can support remote access and managed desktop tools. If agencies have a preponderance of old equipment, they may have to be consigned to a second round of centralization until their workstations are replaced.

MANAGEMENT TRANSITIONS

The new workstation support service will be funded on a cost-recovery basis, in line with current ITD practices. Agencies will be charged based on the number of workstations supported. Assuming internal service provisions we expect some one-time costs related to hiring new staff, setting up facilities, and implementing the necessary software, phone systems, etc. These costs should be incorporated into the rate structure, and amortized over the first two or three years, after which time the agencies should expect to see a rate reduction.

The specific steps needed to implement Desktop Services are:

- ◆ In concert with the desktop standardization initiative, select and deploy the remote access, call logging, knowledge base, and desktop management tools needed
- ◆ Develop service level targets and performance measures
- ◆ Set up centralized Tier 1 help desk support with appropriate training and facilities for staff
- ◆ Deploy Tier 2 staff to be near clusters of agency buildings in Bismarck, with a staff person or two in Fargo, Minot, and possibly other remote sites
- ◆ As the standard desktop is rolled out, move desktop maintenance responsibility to the central workstation administration group
- ◆ Closely monitor workload so that the balance of Tier 1, Tier 2, and workstation administration staff can be adjusted to meet customer service targets and overall cost goals

2. STANDARDIZE WORKSTATIONS

STAFFING TRANSITIONS

Implementing the standard desktop will require a large amount of effort over a short period of time. **We recommend that the State further analyze service alternatives (i.e., staffed internally, or outsourced), attendant costs and benefits, as well as installed hardware and existing replacement budgets before finalizing the replacement approach and schedule.**

MANAGEMENT TRANSITIONS

This initiative will represent a major shift in the desktop funding model for the agencies. Instead of being a one-time expenditure, desktops will become standard items with a monthly charge – much like office space, or a leased copy machine. The Legislature will need to appropriate monies for some agencies to help them with this transition. **Agencies should not be forced to make these additional expenditures with their existing budgets.** Once shifted to this model, the agencies will be able to consistently plan for PC expenditures in their budgets.

Specific steps needed by ITD and the agencies to accomplish this are:

- ◆ Agencies must discontinue purchasing new PCs until the standard is in place
- ◆ ITD will work with agency technical staff to develop the standards and a limited set of options for specialty users, with SITAC providing validation and approval – alternatively, the State could use the EA process to define these standards as long as it happens timely and effectively limits the number of configurations
- ◆ ITD will work with agency management to develop an overall funding model, including options for a variable PC replacement cycle
- ◆ ITD will spearhead the selection of a vendor to supply the equipment and (perhaps) do the rollout, with SITAC having the final approval

3. CONTINUE SERVER CONSOLIDATION

STAFFING TRANSITIONS

The considerations here are similar to Desktop Services centralization but on a much smaller scale. Post HB1505, there are only a few agencies where server support levels are high enough to be a management concern. For these agencies, the timing of technology replacement cycles will be the primary driver for centralization. ITD and the agencies will need to work out concrete timelines for when these transitions will occur, so that the agencies can make the staff cuts necessary.

MANAGEMENT TRANSITIONS

From a funding perspective, consolidation of server administration efforts may require some one-time expenditures to purchase new, higher-capacity servers. Over time, we expect that ITD will be able to lower rates in line with internal staff reductions and lower equipment replacement costs.

Specific steps needed for ITD to accomplish the server consolidation are:

- ◆ Analyze all of the servers centralized by HB1505 to see which ones can be consolidated onto shared servers
- ◆ Work with the agencies to determine where it is cost-effective for them to upgrade to newer software versions or migrate to ITD standard platforms in order to help reduce the total server count
- ◆ Centralize the remaining servers not affected by HB1505 unless such centralization would imperil an agency's finances, security, or business operations
- ◆ Analyze the servers brought in through the second round of centralization for additional consolidation opportunities

4. IMPROVE IT GOVERNANCE PROCESSES

STAFFING TRANSITIONS

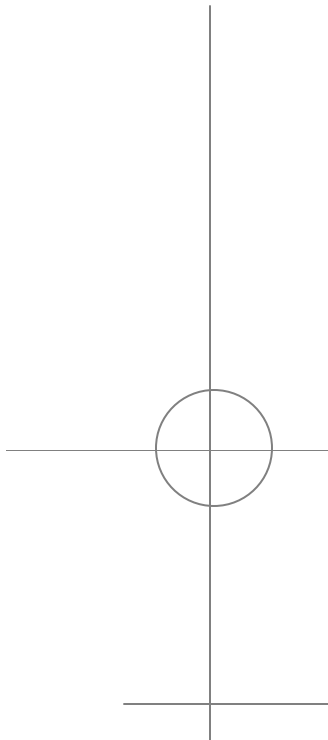
We believe that the State currently expends sufficient effort on strategic IT planning and governance. ITD and the agencies must ensure that the staff do this work within the new governance framework recommended in Section E of this report.

MANAGEMENT TRANSITIONS

This recommendation largely connects a set of existing governance projects and structures into a cohesive IT decision-making structure. Accordingly, the required transition tasks are minimal. The primary effort associated with this recommendation is establishing the tools called for in the process.

Specific steps for completing this recommendation are:

- ◆ SITAC finalizes the process timeline to align it with the State budget process
- ◆ The Governor and State legislators will need to provide SITAC with their vision and goals for IT at the State
- ◆ Using that information, SITAC establishes the initial criteria and circulates them in draft form to decisions makers at the agency and State level for feedback into a final set of criteria
- ◆ ITD and SITAC develop guidelines for innovation fund allotment
- ◆ The CIO's office and the Legislature establish the initial innovation fund
- ◆ OMB and ITD develop the final business case and supporting financial models for IT initiatives
- ◆ ITD and OMB, under the direction of SITAC and the CIO finalize the performance measures and begin the baseline data gathering process
- ◆ ITD will develop the final report card format and content for presentation of s tate IT performance and begin gathering any additional required data



H. IMPLEMENTATION PLAN OUTLINE

This section presents a proposed approach for implementing the recommendations outlined in this study, organized as follows:

1. Recommended Projects
2. Proposed Timelines
3. Cost Impacts

1. RECOMMENDED PROJECTS

Pacific Technologies' recommendations fall into two primary categories: organizational and governance-related. The following table highlights the tasks necessary to implement those recommendations, as well as the key participants responsible for each task.

Major Recommendation	Primary Activities	Responsible Party
Consolidate Provision of Desktop Services	Establish Project Governance Process	ITD
	Establish Service Levels	ITD
	Finalize Implementation Options & Costs	ITD
	Finalize Funding Mechanism	SITAC
	Develop Legislation	Interim IT Committee
	Develop Tactical Roll-Out Plan	ITD
	Implement Consolidated Desktop Services	ITD
Standardize Workstations	Establish Project Governance Process	ITD
	Inventory Hardware and Software	Agencies
	Develop Workstation Options	ITD or EA
	Define Replacement Cycles & Criteria	ITD or EA
	Finalize Implementation Options & Costs	SITAC
	Develop Legislation	Interim IT Committee
	Develop Tactical Roll-Out Plan	ITD
Continue Server Consolidation	Implement Roll-Out Plan	ITD
	Establish Project Governance Process	ITD
	Develop Preliminary Consolidation Schedule	ITD
	Develop Legislation	Interim IT Committee
	Develop Tactical Roll-out Plan	ITD
Implement Governance Recommendations	Implement Roll-Out Plan	ITD
	Develop SITAC Initial Evaluation Criteria	SITAC
	Finalize and Communicate SITAC Evaluation Process	SITAC
	Develop IT Innovation Guidelines	SITAC
	Establish State-wide IT Business Case Templates and Tools	ITD
	Develop Baseline State-wide ITD Performance Measures	ITD
	Develop Legislative Reporting Package Templates	ITD

Descriptions of each task follow.

CONSOLIDATE PROVISION OF DESKTOP SERVICES

Establish Project Governance Process

This task involves the effort required to charter the project, identify participants and decision mechanisms, and finalize the workplan. ITD will be responsible for the logistics of this task, utilizing input from SITAC.

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Establish Service Levels

This task establishes performance commitment levels for Desktop Services. ITD will develop these levels in collaboration with agencies to ensure they meet existing business needs. ITD should also leverage industry best practices to help define the commitment areas as well as to inform adequate service levels.

Finalize Implementation Options & Costs

This task incorporates the effort necessary to come to conclusion on the service delivery approach and associated costs. *The key decision is whether to provide these services internally or through an outsourcing arrangement.* ITD would first need to establish the viability of contracting for these services and, if it is viable, identify costs required to meet the identified service levels. ITD would then need to model the different cost and service level options. SITAC would make a final recommendation on the direction the State should pursue. If the selected course of action is outsourcing, there would likely need to be additional approvals.

Finalize Funding Mechanism

This task defines the State's approach to funding provision of the services. In addition, this task identifies a mechanism to identify and allocate cost savings that accrue over time. Options include returning the dollars to associated revenue funds, distributing some monies to agencies that will have a net-negative financial impact from this recommendation, or building a fund for state-wide IT initiatives.

Develop Legislation

If legislation is required to implement the consolidation, the Interim IT Committee, working with SITAC, will develop any legislation required to statutorily support the selected course of action. The legislation may cover a variety of topics, including authorization of outsourcing (if it is the selected option) or any major changes to state governance and/or funding structures.

Develop Tactical Roll-Out Plan

This activity involves the effort required of ITD and the agencies to plan the specific, granular tasks required to implement the selected approach for this recommendation. *Note: the roll-out plan must also concurrently address the workstation standardization recommendations to enable Desktop Services to operate efficiently and effectively.*

The output of this task will be a workplan that identifies and documents each task, establishes associated managerial responsibilities and staffing, identifies the timelines and precedence, establishes key milestones and check points, and defines success measures and targets.

Pacific Technologies suggests the State take a phased approach in this workplan – first implementing in a small number of agencies that are likely to achieve a significant individual benefit from this effort (e.g., Transportation, Human Services). This approach will allow the State to identify key lessons and refine the method for implementing consolidating desktop support on a state-wide level. The tactical plan should include the appropriate tasks and mechanisms for incorporating changes based on experiences learned in the first phase.

Implement Roll-Out Plan

In this task, ITD and the agencies execute the roll-out plan identified in the previous step. In addition to implementing any staff transfers or executing an outsourcing contract, this task includes purchasing and implementing additional licenses of existing software (such as the State's help desk application) as well as new software products necessary to remotely manage and support users' computers. It also includes purchasing and configuring new hardware. This task concludes with a post-implementation review to document lessons learned and identify achievement of success measures.

STANDARDIZE WORKSTATIONS

Establish Project Governance Process

This task involves the effort required to charter the project, identify participants and decision mechanisms, and finalize the workplan. ITD will be responsible for the logistics of this task, utilizing input from SITAC.

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Inventory Hardware and Software

This task incorporates the effort to create two separate inventories of state assets – workstations and business applications. For the workstations, ITD and the agencies will work together to document key information – to be determined as part of this process – about each workstation in use, including a listing of each workstation, performance and configuration information, and asset life data.

Similarly, the agencies and ITD will document each business application in use, associated workstation configuration requirements (e.g., client requirements), underlying technologies, etc.

Develop Workstation Options

Given the data collected in the previous task, as well as input from market sources and best practices, ITD will work with agencies to identify between two and four hardware configurations that will be sufficient to meet the needs of all state workstation users. This task also involves defining software configuration requirements, with the goal of minimizing the number of standard configurations. As noted previously, the appropriate EA domain team might also assume responsibility for this effort.

Define Replacement Cycles & Criteria

This task encompasses the ITD and agency effort necessary to establish the replacement cycle options (likely between three and four years). It also establishes the criteria that must be met for a given replacement cycle. For example, the bottom-level workstation option may not be allowed on the longest replacement cycle to avoid machines that are grossly underpowered at the end of their expected life. The appropriate EA domain team may be given responsibility for this effort, as well.

Finalize Implementation Options & Costs

Based on the all collected data and associated decisions, SITAC, ITD, and the agencies come to final agreement on the matrix of workstation options and associated replacement timelines. Given that number, ITD will finalize cost estimates on a per-workstation basis.

Finalize Funding Mechanism

This task identifies the approach the State will take to funding this project. The initiative will likely require a significant initial outlay of dollars beyond amounts already budgeted for workstation replacements. This money would be required for a major initial procurement and/or to establish a fund for annual replacement expenditures costs. This task also establishes the means for maintaining adequate dollars in the fund (e.g., monthly workstation charges, etc.).

Develop Legislation

This task creates the legislation necessary to establish the one-time funds and ongoing funding mechanism – as well as any additional new statutory parameters. The Interim IT Committee, working with SITAC, will develop the legislation.

Develop Tactical Roll-out Plan

This task involves the effort necessary to develop the specific steps necessary to execute the plans developed in the previous tasks. Given the close linkages between this recommendation and the Desktop Services consolidation, we recommend planning for and implementing those two tasks as a single project. See the roll-out plan for *Consolidate Provision of Desktop Services* for additional detail.

Implement Roll-Out Plan

As indicated above, we recommend implementing this recommendation in lock-step with the Desktop Services recommendation. Once again, refer to the implementation task *Consolidate Provision of Desktop Services* for additional detail.

CONTINUE SERVER CONSOLIDATION

Establish Project Governance Process

This task involves the effort required to charter the project, identify participants and decision mechanisms, and finalize the workplan. ITD will be responsible for the logistics of this task, utilizing input from SITAC.

Develop Preliminary Consolidation Schedule

This task incorporates the agency and ITD effort required to identify remaining agency-based servers and their expected replacement timeline. That timeline, informed by additional information such as major state and agency projects, will provide a basis for the consolidation schedule ITD will develop.

Develop Legislation

This task creates any legislation necessary to support this project, including governance regulations and funding and personnel transfers. The Interim IT Committee, working with SITAC, will develop the legislation.

Develop Tactical Roll-out Plan

This task creates the approach agencies and ITD will take to execute the consolidation schedule created above. In addition to timing, the plan will spell out responsibilities for transferring data and applications, technical management requirements, and establishing baseline and future post-move performance measures.

The plan will also identify the approach for moving impacted staff, if any.

Implement Roll-Out Plan

This task involves the effort necessary to execute the tactical plan over the course of the project. This effort will likely last several years as servers are retired over that time horizon.

IMPLEMENT GOVERNANCE RECOMMENDATIONS

Develop SITAC Initial Evaluation Criteria

In this task, SITAC— with support of ITD — develops a candidate set of criteria to serve as yardstick for evaluating future IT initiatives and plans. A key input to this effort will be gathering state-wide and IT-specific visions and goals from the Governor and the Legislature. Based on that input, SITAC will develop a set of evaluation measures that distill a single vision for IT at the State of North Dakota. The criteria should be measurable, discrete, and concise.

Once developed, ITD will circulate the draft criteria to the Governor, Legislature, and agencies for comment. SITAC will evaluate that feedback, making changes as appropriate, and distribute the finalized criteria.

Finalize and Communicate SITAC Evaluation Process

Using the criteria as well as legislative and gubernatorial input as guidelines, SITAC will refine the process to apply the criteria. This effort will further refine the approach outlined in section E of this chapter, as well as establish the internal SITAC procedures and protocols necessary to perform the evaluation and prioritization tasks. ITD and SITAC are currently developing a “portfolio-management”-based approach. This methodology is consistent with best practice efforts we have seen at other public entities, and should result in an effective project evaluation methodology.

Develop IT Innovation Guidelines

Working with ITD and the agencies, SITAC establishes a set of guidelines for evaluating non-standard projects. The need to deploy emerging technologies and innovative approaches to technology is inevitable, even in the relatively conservative public sector environment. The purpose of the innovation guidelines is to put structure around determining which of these initiatives will be considered.

The guidelines should identify specific acceptable risk tolerances and minimum levels of industry acceptance for candidate projects. These guidelines must also identify business-based requirements, such as minimum return-on-investment (ROI).

These guidelines should go through a review/refinement process with IT representatives in the agencies and ITD before finalization.

Establish State-wide IT Business Case Templates and Tools

This task creates the specific documentation and mechanisms that agencies will use in evaluating potential IT initiatives, and that will become part of the SITAC evaluation process. These tools will include the financial models necessary to identify total cost and ROI, as well as help identify project performance measures and targets. They will also facilitate the agencies in linking projects to agency and state operational and IT goals. Finally, the tools will assist in linking initiative benefits and outcomes to the SITAC criteria and guiding principles.

Section E of this chapter further outlined components of these tools.

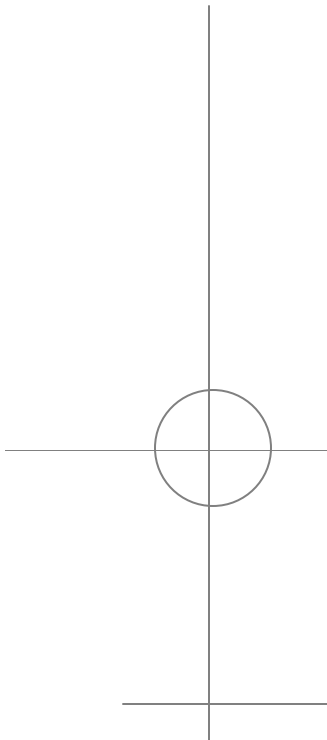
Develop Baseline State-wide ITD Performance Measures

This task identifies key IT metrics for evaluation and collects baseline data associated with current state performance. These metrics should be both operationally and technologically focused.

Additionally, the State needs to identify and collect data for aggregate measures that identify overall staffing levels and expenditures for a variety of different tasks and goods. These can include effort and associated costs for server administration and user support, as well as expenditures for various types of hardware and services. ITD should collect this data at the lowest level of detail possible to allow a variety of approaches to analysis. See Section E, subsection 4 of this chapter for more information on recommended performance measures.

Develop Legislative Reporting Package Templates

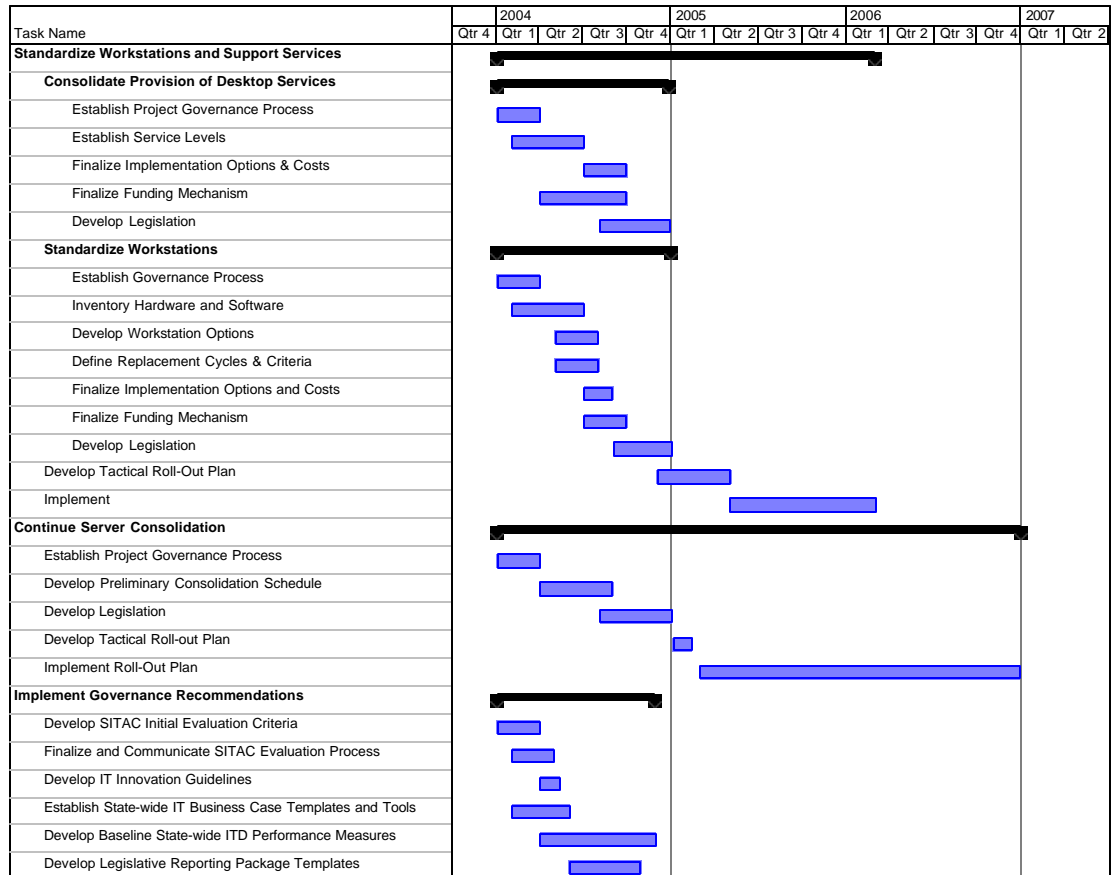
To assist legislative and other high-level decision makers in evaluating the State's overall IT progress, this task creates a template that can be used to assemble key metrics that present a broad picture of IT at the State. This template should leverage heavily the measures identified in the previous task. ITD should work closely with legislative staff to ensure that the resulting document will effectively convey the information most important to state decision makers.



2. PROPOSED TIMELINE

The following Gantt chart presents a suggested implementation schedule for the activities outlined above. The State will need to refine the overall timeline predicated on more in-depth analysis, other State initiatives, and resource constraints.

Proposed Project Schedule



**IT Organization
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Study**

**CHAPTER 3:
Recommendations**

3. COST IMPACTS

The table below summarizes a range of goods and services costs the State can expect to incur through implementing this study's major recommendations.

Goods and Services Project Costs

	Low Estimate		High Estimate	
	One-Time	Recurring	One-Time	Recurring
Consolidate Provision of Desktop Services				
Consulting Services for Service Levels, Options/Costs, Rollout Plan	\$ -	\$ -	\$ 130,000	\$ -
Help Desk and Remote Management Software	\$ 100,000	\$ 280,000	\$ 530,000	\$ 70,000
Help Desk and Remote Management Implementation	\$ 30,000	\$ -	\$ 290,000	\$ -
Help Desk Staff Training	\$ 30,000	\$ -	\$ 60,000	\$ -
Subtotal	\$ 160,000	\$ 280,000	\$ 1,010,000	\$ 70,000
Standardize Workstations				
Consulting Services for Inventory and Imaging	\$ 20,000	\$ -	\$ 430,000	\$ -
Statewide Average Annual Workstation Cost	\$ -	\$ 2,950,000	\$ 11,030,000	\$ 3,680,000
Subtotal	\$ 20,000	\$ 2,950,000	\$ 11,460,000	\$ 3,680,000
Continue Server Consolidation				
Consulting Services for Consolidation Schedule	\$ -	\$ -	\$ 20,000	\$ -
Subtotal	\$ -	\$ -	\$ 20,000	\$ -
Implement Governance Recommendations				
Consulting Services for Templates & Tools	\$ -	\$ -	\$ 50,000	\$ -
Innovation Fund	\$ -	\$ 140,000	\$ -	\$ 280,000
Portfolio Management Software	\$ 480,000	\$ 60,000	\$ 960,000	\$ 60,000
Subtotal	\$ 480,000	\$ 200,000	\$ 1,010,000	\$ 340,000
Total - All Projects	\$ 660,000	\$ 3,430,000	\$ 13,500,000	\$ 4,090,000

* The relatively high recurring cost reflects a lease, rather than a one-time purchase, of the necessary software.

The remainder of this section provides further information on the cost components for each major recommendation.

CONSOLIDATE PROVISION OF DESKTOP SERVICES

This project reflects the most significant organizational impact of all the recommendations. To be successful, and result in a net cost reduction in ongoing expenditures, a well planned implementation is critical. The cost components include:

Consulting Services for Service Levels, Options/Costs, Roll-out Plan

This set of consulting services are included to cover potential assistance the State might need in planning for establishing the help desk, the roll-out, and the intended service levels. It could also incorporate an options analysis of alternative costs and benefits – if necessary. Naturally, the State could take the approach it has taken with previous efforts and conduct this effort in-house.

Help Desk and Remote Management Software

One-time costs include the procurement and implementation of the software and management tools necessary to drive down state staffing levels for these services while maintaining required service levels. Ongoing costs include maintenance fees associated with these tools.

Help Desk and Remote Management Implementation

This includes the one-time costs for assistance with the implementation of the help desk and remote management software.

Help Desk Staff Training

This separate activity is included to underscore the importance of providing adequate training in the new help desk and support tools for ITD staff.

STANDARDIZE WORKSTATIONS

While the dollars presented for this project are significant, they reflect the aggregation of costs that are largely already being expended. The State can expect that the amount depicted to likely result in a net increase – though the exact current expenditures were not available to confirm this assertion. That fact, in itself, highlights the need for better understanding this core, ongoing cost. Cost components include:

Consulting Services for Inventory and Imaging

This range of costs reflects the variety of options the State can take in supporting the roll-out of this effort. At the low end, a small amount of consulting is used for establishing the roll-out plan. At the upper end, the State is contracting with a third party to assist in creating the workstation “images” (i.e., standard workstation configurations) and in the roll-out of the initial implementation.

State-wide Average Annual Workstation Cost

This cost component reflects an annualized view of money the State is likely to spend once the replacement cycle has stabilized. Its range reflects a blend of workstations that cost approximately \$1000 per PC, replaced on a cycle averaging slightly longer than every three years. In fact, the actual amount spent will be driven by the actual workstation options and replacement cycles selected by the agencies to meet their business needs.

CONTINUE SERVER CONSOLIDATION

Given that server consolidation is largely complete, this effort will require minimal expenditures. We have not accounted for purchasing any new servers, as we expect the consolidation to save money in this arena. This project assumes the State is capable of performing this project in-house with internal staff. Accordingly, the only external expenditure might be to contract with a third party to assist in developing the consolidation schedule. The State could choose to forgo this expenditure.

IMPLEMENT IT GOVERNANCE RECOMMENDATIONS

Governance recommendations will require relatively modest expenditures – most of them derived from implementing new tools to help manage the State’s decision-making processes. The specific cost components – consulting, the innovation fund, and portfolio management software – are described below.

Consulting Service for Templates and Tools

This cost component captures the specific expenditures the State might choose to make to support development of the business case and other governance tools. As the cost table indicates, the State could elect to do these functions in-house – a process that is already underway – thereby avoiding this cost altogether.

Innovation Fund

This component captures the expenditures necessary to establish and maintain an innovation fund. The State will need to determine exactly how it will replenish this fund and how much it wants to devote to this effort. For planning purposes, we used a range between .25% and .5% of the adjusted Executive IT budget. There are a variety of alternatives the State could use for creating this fund, including general fund monies, capturing IT project cost savings, potential cost savings from this plan, or pursuing relevant grant monies.

Portfolio Management Software

Pacific Technologies recommends that the State continue to explore using software to help manage and automate its project portfolio and associated prioritization. This component captures the associated costs. The State could also choose to forgo this expenditure.

APPENDIX

A

glossary

**IT Organization
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Appendix A:
Glossary

This appendix provides a glossary offering explanations and definitions of key terms and acronyms used in this report.

GLOSSARY

ADMINISTRATIVE SUPPORT – the activities related to the provision of clerical, administrative, and related services required for the ongoing operation of the IT department

APPLICATION DEVELOPMENT, DEPLOYMENT, AND MAINTENANCE – the activities related to developing, installing, integrating, interfacing, and testing business-specific packaged applications and their associated data, including managing vendor relationships, and providing necessary business context for integration. Includes installing new releases and bug fixes, extracting data for use by other applications, updating and making enhancements to existing software applications to meet new requirements, customizing reports for users, and interfacing with vendor staff as required. Engineering new software to meet business needs, integrate third party software, and accommodate special requests. Development phases include design, coding, testing, and implementation.

ASSET MANAGEMENT – the activities related to managing the IT properties of the organization, include tracking serial number, warranty, and inventory.

BUSINESS APPLICATION SERVICES – those functions related to providing, maintaining, and supporting the use of software needed to meet the operational, management, and reporting requirements of the organization.

CAPITAL BUDGET – funds allocated to one-time expenses, usually for depreciable assets

CENTRALIZED SERVICE DELIVERY MODEL – a model of IT service delivery that places all responsibility for IT support with a single, centralized service provider.

CJIS – criminal justice information sharing

COMPUTING AND NETWORKING INFRASTRUCTURE CONSOLIDATION – the efficient concentration or convergence of divergent and diverse IT Systems.

COOKS – this number counts the individuals required for a particular function, as opposed to the FTE effort level. For example, an agency might have 5.5 FTE of server administration performed by 8 staff. This amount of service could be provided by as few as 6 individuals, so the Cooks (as in “too many cooks spoil the broth”) number would be 2.

CURRENT IT MODEL – North Dakota’s current IT architecture, governance, organization and environment (i.e., the current information processing environment, including technical, staffing, and cost data).

CUSTOMER SERVICES – those functions related to directly supporting users of IT systems and services.

DATA CENTER OPERATIONS – the activities related to administering the operation of the host/mainframe computing platforms, managing their operating systems to keep functionality at optimal performance levels, performing data backups and restoration, and managing associated peripheral devices.

DATABASE ADMINISTRATION – the activities related to planning, implementing, and administering the data structures required to support the organization’s applications portfolio, and to maintaining the data contained within the organization’s defined data structures. Includes data synchronization, validation, backup, and recovery.

DBMS – database management system. Computer software that is used to create, access, and control the database.

DEPARTMENTAL MANAGEMENT – the activities related to management and oversight of the organization’s technology functions: including personnel management, quality assurance, policies and procedures, standards, and budgeting. Includes supporting the organization’s management on matters

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Appendix A:
Glossary

related to it decision-making. Activities may include coordinating meetings, establishing agendas, providing background materials and recommendations, keeping minutes and preparing presentations.

DESKTOP SERVICES – the IT support services related to support and maintenance of end users and their computing equipment, e.g., PCs.

DISASTER RECOVERY MANAGEMENT – the activities related to developing, maintaining, updating, and testing the organization's it disaster recovery/business resumption plan, and to activating and managing the plan in the event of a disaster.

DISTRIBUTED SERVICE DELIVERY MODEL – a model of IT service delivery that completely decentralizes support for IT.

EA – Enterprise Architecture

END USER APPLICATION SUPPORT – the activities related to the desktop setup and installation and maintenance, and to supporting the day-to-day use of, the organization's business applications. For instance, helping a user accomplish a specific business function, or updating value in a validation table would qualify as business application support.

ENTERPRISE – a business organization or entity in its entirety

ERP – enterprise resource planning. A term originally used to describe enterprise-wide systems that include financial, human resource, and materials management functions in a production environment, but is often used to describe an enterprise-wide implementation of a single, complex, and completely integrated system that can automate virtually every business process within the organization.

FEDERATED SERVICE DELIVERY MODEL – a model of IT service delivery which places the responsibility for shared resources (e.g., network infrastructure) with a centralized service provider, while users of non-shared services are responsible for maintaining the resources and applications that are particular to them.

FTE – full time equivalency for a job, or the relative percentage to "full time" which an employee or contractor is scheduled to work. For example, an employee or contractor who is scheduled to work 80 hours per bi-weekly pay period is considered 1.0 FTE, whereas an employee or contractor who works 40 hours per bi-weekly pay period is considered .50 FTE.

GIS – geographic information systems

FUTURE IT MODEL – North Dakota's recommended future it architecture and environment

GANTT CHART – a bar graph or other graph that helps plan and monitor project development or resource allocation on a horizontal time scale. Gantt charts are used to indicate and monitor diverse aspects of project management, including without limitation: the exact duration of specific tasks, the relationship between tasks, planned and actual completion dates, cost of each task, the person or persons responsible for each task, and the milestones in a project's development.

HELP DESK – a source of technical support for hardware or software. Help desks are staffed by people that can either solve the problem directly or forward the problem to someone else.

INFORMATION TECHNOLOGY (IT) – the profession concerned with all aspects of managing and processing information via computers and computer systems.

IT – information technology (see above)

IT ADMINISTRATION AND PLANNING – those functions related to the planning, oversight, security, and day-to-day operations of the technology function at the organization.

ITD – Information Technology Department

IT PROCUREMENT – the activities related to acquisition of goods and services in support of all it functions; including the development of RFPs, evaluation and selection of vendors, management of purchasing activities, receipt and inventory of goods, and tracking of warranty information and performance guarantees.

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Appendix A:
Glossary

JOAT – “jack of all trades.” This counts the number of IT service functions performed by each individual – for instance, one person might perform e-mail administration, database administration, help desk, and project management; giving that individual a JOAT number of 4. The overall JOAT number for an agency is the average JOAT number for all of its staff. Simply, this number provides an indication of how many multiple IT service “hats” are worn by each individual within an organization.

LAN – local area network, a collection of computers and/or computing devices (e.g., printers, wireless PDAs) that are connected to allow the sharing of resources; generally within a building or a floor of a building.

NETWORK CONNECTIVITY (WAN/LAN/WIRELESS) – the activities related to implementing and maintaining the operational integrity of the organization’s local and wide-area networks, both wired and wireless. Technologies include building wiring, fiber optic data circuits, and point-to-point technologies such as laser and microwave. These activities include responding to user requests for assistance, performance monitoring, coordinating with external network service providers, and taking appropriate corrective actions as needed.

NETWORK CONSOLIDATION – the unification of two or more similar networks for the purpose of efficiency in transport or management.

OPERATING BUDGET – funds allocated for ongoing expenses, generally used for such items as salary, maintenance contracts, etc.

PC – personal computer. A single-user computing device that does not necessarily rely on another computer to perform data processing.

PERFORMANCE MEASURE – A quantitative indicator [measure] that can be used to track progress toward an objective

RESEARCH AND DEVELOPMENT – the activities related to evaluation and testing of current and future it products and services, and to the deployment of pilot projects to test the viability of these technologies for the organization. Includes dissemination of relevant information to appropriate parties.

PROJECT MANAGEMENT – those activities related to the oversight and coordination of major technology initiatives.

RFP – Request for Proposals

SECURITY ADMINISTRATION – the activities related to developing, maintaining, and administering the security plan and overall security approach for the organization’s host processors, servers, personal computers, communication devices, and networks. Includes detection of intrusions and intrusion attempts, monitoring of network events, operating and maintaining firewalls.

SERVER – a computer which provide shared files, applications, connectivity, or print services to users of a network

SERVER ADMINISTRATION – the activities related to implementing and maintaining network servers. These activities also include administration, account management, and operation of file, print, and application servers and other logical network devices; performance management; tuning; applying operating system patches and upgrades; and administering configuration data.

SHADOW STAFF – non-IT-titled staff who spend 10% or more of their time performing IT support tasks

SITAC – State Information Technology Advisory Committee

STATE AGENCY – every board, commission, department, or agency of the State of North Dakota, whose costs are paid, in whole or in part, from funds held in the State Treasury.

STORAGE MANAGEMENT – the activities related to deploying, upgrading, managing, and maintaining centralized enterprise storage devices and networks. Includes aggregating and consolidating data, applying retention and destruction policies, performance tuning, monitoring and reporting on utilization.

STRATEGIC PLANNING – the activities related to identifying and evaluating the future directions for it application, networks, and hardware for the organization. Includes capacity planning, strategic planning, technology research, and feasibility studies.

SYSTEM – any computer, computer system, computer network, computer program or combination of other data processing or communication device along with the business processes they are intended to support.

SYSTEM SERVICES – those functions related to implementing, maintaining, and supporting the organization's computers, systems software, and connectivity.

TELEPHONE SYSTEMS SUPPORT – the activities related to implementing and maintaining the operational integrity of the organization's voice network. This includes responding to user requests for assistance, administering data associated with the voice network, performance monitoring, coordinating with telecommunications providers, and taking appropriate corrective actions as needed.

TIER 1 – activities related to providing a first point of contact for users to report problems. Includes initial problem resolution, triage, and problem escalation.

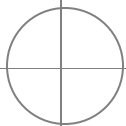
TIER 2 – the activities related to maintenance and support of the organization's personal productivity software (e.g., Microsoft office), network applications (e.g., calendar, email, etc.), desktop computers, mobile computing devices (e.g. Laptops, PDAs, etc.), and peripherals.

TRAINING – the activities related to providing technology-related instruction to staff aimed at enhancing their skills, knowledge, and performance. Includes training requirement analysis, course design and development, and training delivery.

WAN – wide area network. A collection of computers and/or computing devices that are connected to permit sharing of resources either with cables or a variety of other non-cabled methods; generally over a large geographic area, such as a city, state, or region.

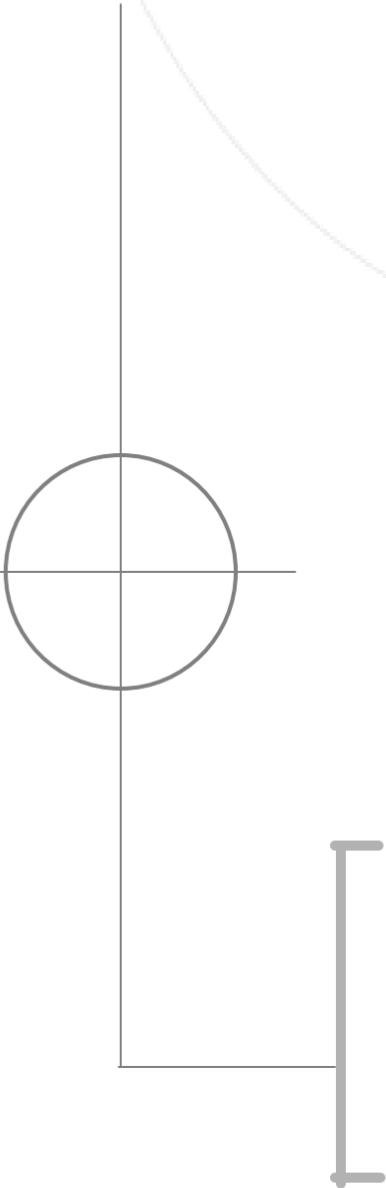
WORKSTATION ADMINISTRATION – the activities related to the setup, configuration, original installation, and scheduled maintenance of end users' desktop computers and peripherals. Includes installation and configuration of PC operating systems and software, such as personal productivity tools and anti-virus applications. Includes the creation and maintenance of disk images, application of patches and updates, and all scheduled maintenance.

WORKSTATION – single user computing device, such as a PC or terminal



APPENDIX

B



IT staffing detail

**IT Organization
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 Study**

Appendix B:
 IT Staffing Detail

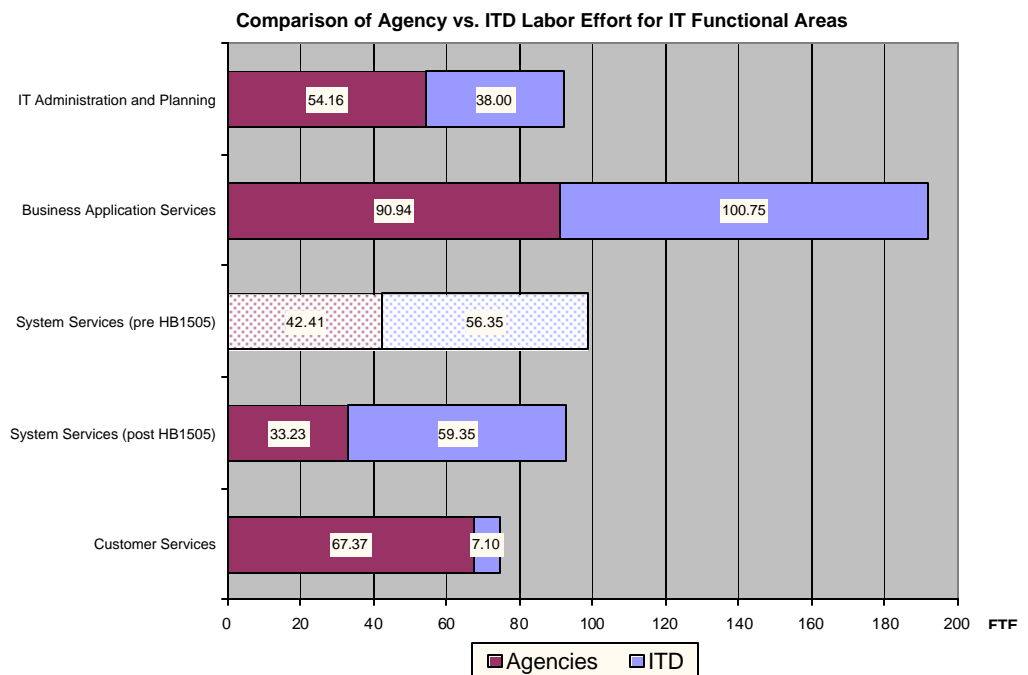
This appendix contains underlying data and additional charts from our IT staffing analysis, organized as follows:

- A. Summary charts
- B. Agency-specific COOKS analysis
- C. ITD and agency labor costs for IT services
- D. Staffing summary sheets
- E. Desktop services analysis detail

A. SUMMARY CHARTS

STAFFING ANALYSIS

The following charts summarize some of the key analysis conducted in support of our staffing findings and recommendations.

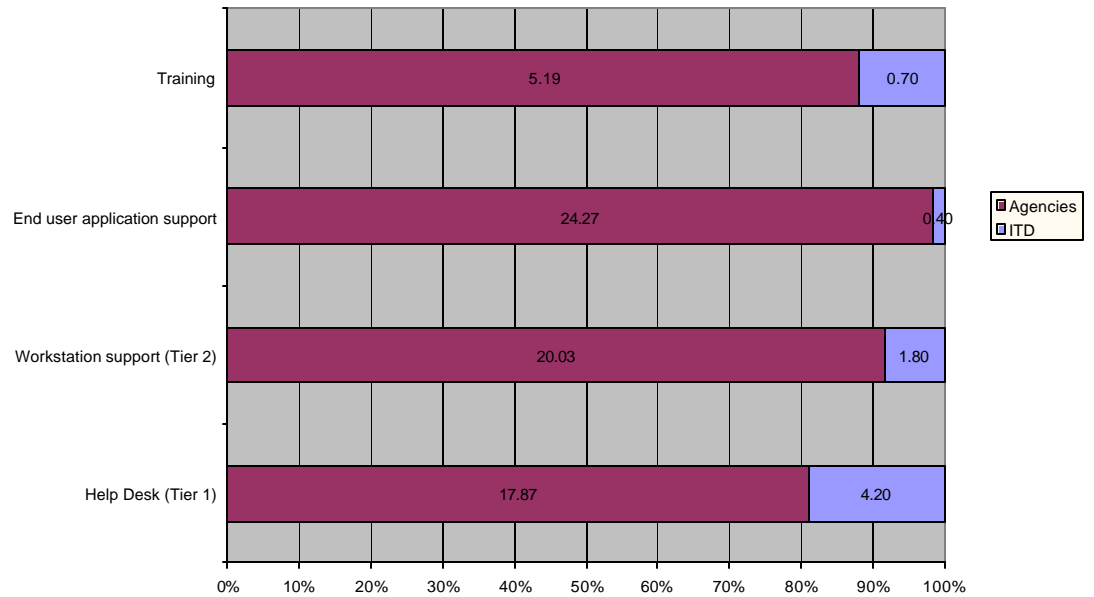


IT Organization and Management Study

Appendix B: IT Staffing Detail

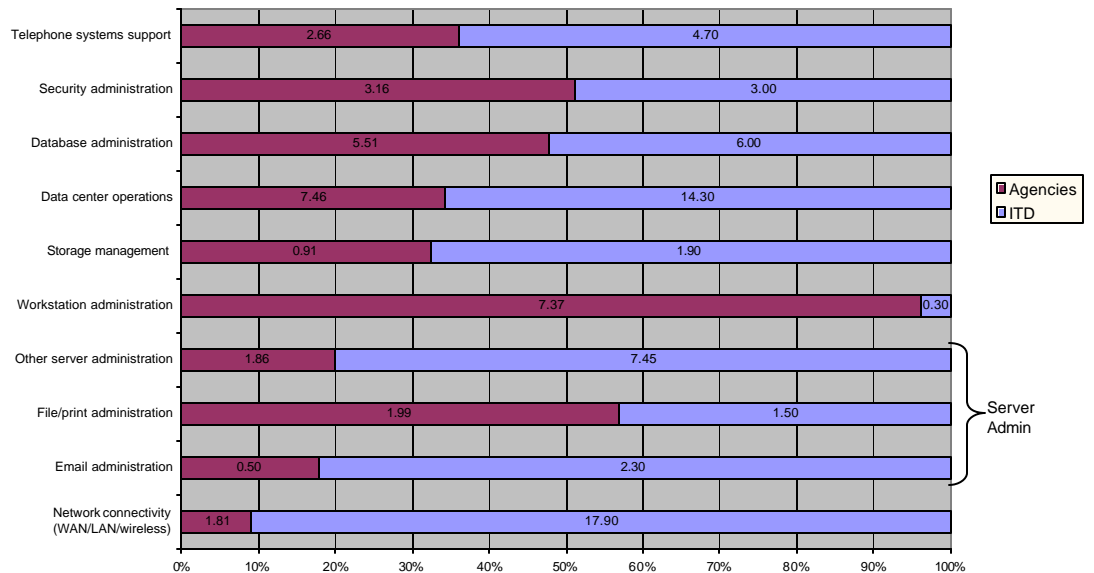
Comparison of Agency vs. ITD Labor Effort for Customer Service Functions

- ITD performs these functions only for itself and the Governor's Office, with the agencies largely providing their own support
- Tier 1 and Tier 2 support does not include 1 FTE of effort provided to the smaller agencies under a contract with the Association of Counties



Comparison of Agency vs. ITD Labor Effort for System Services Functions

- Network connectivity and server administration are largely centralized within ITD
- Workstation administration is performed almost exclusively by the agencies, and should be considered part of Customer Service
- The remaining functions are supported by both ITD and the agencies

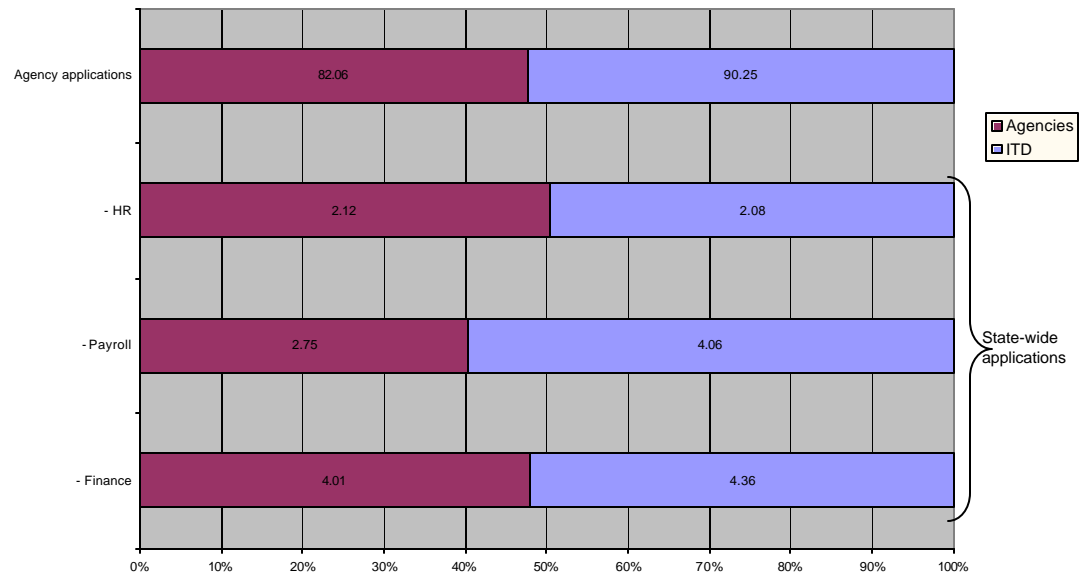


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Appendix B: IT Staffing Detail

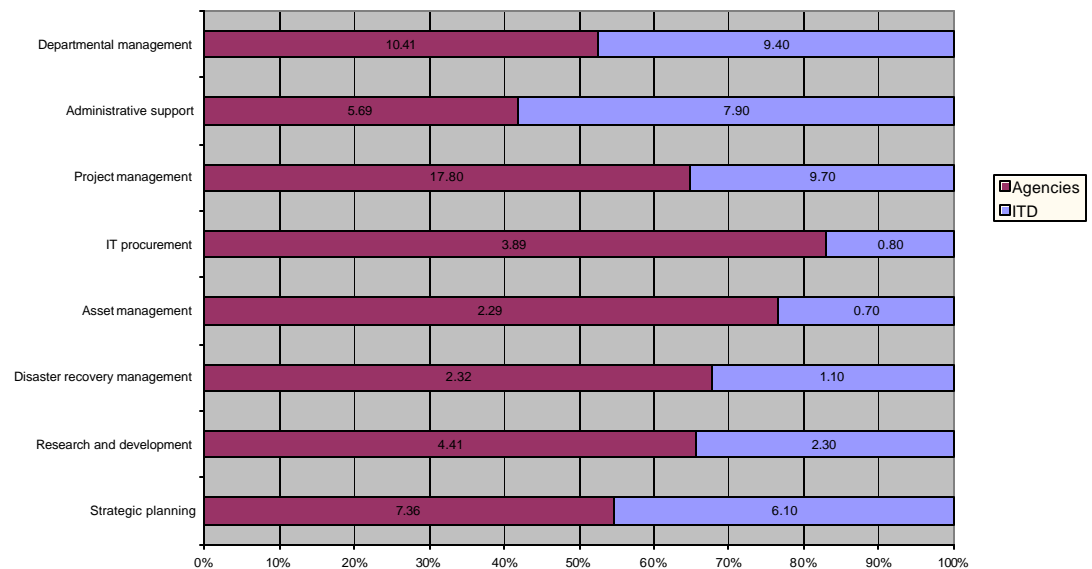
Comparison of Agency vs. ITD Labor Effort for Business Application Services Functions

- Effort is about evenly split between the agencies and ITD for agency-specific application development and maintenance
- This appears to be true for the state-wide applications as well; however virtually all of the "agency" effort comes from OMB



Comparison of Agency vs. ITD Labor Effort for IT Planning & Administration Functions

- IT procurement and asset management are largely performed by the agencies
- Other functions are split between the agencies and ITD



The table on the following page presents the number of staff at each agency that are applying greater than a 50% FTE effort to tier 1 (help desk) support, tier 2 (workstation) support, workstation administration, and server administration.

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Appendix B:
IT Staffing Detail

Count of Staff with >= 50% FTE

Agency	Tier 1 Staff	Tier 1 + Tier 2 + Workstation Admin Staff	Tier 1 + Tier 2 + Workstation Admin + Server Admin Staff
Adjutant General			
Office of Administrative Hearings			
Aeronautics Commission			
Agriculture Department			
Council on the Arts			
Attorney General			
Auditor's Office			
Bank of North Dakota	1	1	1
Department of Commerce			1
Department of Corrections			
Children's Services Coordinating Committee			
Division of Emergency Management			
Department of Financial Institutions			
Game and Fish Department			
Governor			
Department of Health			1
Highway Patrol			
Historical Society			
Housing Finance Agency			1
Department of Human Services		13	14
Indian Affairs Commission			
Industrial Commission			
Information Technology Department	n/a	n/a	n/a
Insurance Commissioner			
Job Service	1	5	5
Judicial Branch	1	1	3
Labor Department			
Land Department			1
Legislative Council			1
State Library			
Office of Management and Budget			1
Mill and Elevator			
School for the Blind			
Parks and Recreation			1
Protection and Advocacy Project			
Public Employees Retirement System			
Department of Public Instruction		2	2
Public Service Commission			
Retirement and Investment Office			
School for the Deaf			
Secretary of State			
Securities Commissioner			
Tax Department			
Department of Transportation	3	5	5
State Treasurer			
Forest Service			
Seed Department			
Department of Veterans Affairs			
Veterans Home			
Vocational and Technical Education Board			
Water Commission			
Workforce Safety and Insurance	1	3	4
Totals	7	30	41

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Appendix B:
 IT Staffing Detail

Summary of Staffing Levels by Agency and Category

Agency	IT Staff	Contractors	Shadow Staff	TOTAL
Adjutant General	1.00	0.05		1.1
Office of Administrative Hearings				
Aeronautics Commission				
Agriculture Department				
Council on the Arts			0.83	0.8
Attorney General	8			8.0
Auditor's Office				
Bank of North Dakota	25.5	0.95	0.36	26.8
Department of Commerce	1.00	0.16	1.25	2.4
Department of Corrections	4			4.0
Children's Services Coordinating Committee				
Division of Emergency Management	0.45			0.5
Department of Financial Institutions				
Game and Fish Department	2			2.0
Governor				
Department of Health	7		0.85	7.9
Highway Patrol	4.00			4.0
Historical Society			0.15	0.2
Housing Finance Agency	2			2.0
Department of Human Services	34	1		35.0
Indian Affairs Commission			0.33	0.3
Industrial Commission	2		1.00	3.0
Information Technology Department	202	3.2		205.2
Insurance Commissioner	1			1.0
Job Service	26.30		2.45	28.8
Judicial Branch	9.001			9.0
Labor Department		0.006		0.0
Land Department	1.7			1.7
Legislative Council	4.00	1.60		5.6
State Library				
Office of Management and Budget	2	4.09	13.4	19.5
Mill and Elevator	1	0.375		1.4
School for the Blind	0.70		0.35	1.1
Parks and Recreation	0.995		0.60	1.6
Protection and Advocacy Project				
Public Employees Retirement System	3.003			3.0
Department of Public Instruction	6.50	1.00	0.2	7.7
Public Service Commission	2			2.0
Retirement and Investment Office	2			2.0
School for the Deaf				
Secretary of State		2.00	2.605	4.6
Securities Commissioner				
Tax Department	4.48	0.03		4.5
Department of Transportation	28.25	1.6		29.9
State Treasurer				
Forest Service				
Seed Department				
Department of Veterans Affairs				
Veterans Home				
Vocational and Technical Education Board	0.2			0.2
Water Commission	1.97			2.0
Workforce Safety and Insurance	22.415			22.4
TOTAL	410.46	16.06	24.38	450.90

WORKSTATION DISTRIBUTION

The following table provides additional detail about the distribution of workstations across the State.

Workstations Located Outside Bismarck/Mandan, by Municipal Area

Location	DHS	DOT	Job Svc.	Industrial	DOCR	TOTALS
Devils Lake	72	38	26		7	143
Dickinson	92	27	23	6	8	156
Fargo	193	59	86		33	371
Grafton	165	4	23		2	194
Grand Forks	150	49	75		11	285
Jamestown	340	13	22		68	443
Minot	132	42	49	5	9	237
Rolla		2	20		4	26
Valley City		27	11			38
Wahpeton		6	14		3	23
Williston	64	33	19	4	5	125
OTHER*		96	15		2	113
TOTALS	1208	300	368	15	150	2041

The following table presents information regarding the distribution of workstations between Bismarck, municipal areas with greater than 10 State PCs, and municipal areas with fewer than 10 State PCs.

Distribution of PCs

	DHS	DOT	Job Svc.	Industrial	DOCR
% of Agency Computers in Bismarck	35%	58%	54%	81%	72%
% out of Bismarck in an area w/ > 10 State PCs	65%	32%	44%	19%	27%
% out of Bismarck in an area w/ < 10 State PCs	0%	10%	2%	0%	0%

**IT Organization
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Appendix B:
IT Staffing Detail

B. AGENCY-SPECIFIC COOKS ANALYSIS

The chart below presents additional COOKS analysis and commentary for those agencies with 4 or more IT staff.

Agency Cooks Analysis

Agency	IT FTE total	Overall Round COOKS
Department of Public Instruction	7.70	0.30
Tax Department	4.51	0.40
Highway Patrol	4.00	0.80
Bank of North Dakota	26.81	1.48
Legislative Council	5.60	1.37
Department of Corrections	4.00	1.50
Workforce Safety and Insurance	22.42	1.70
Office of Management and Budget	19.49	2.88
Attorney General	8.00	3.35
Secretary of State	4.61	3.58
Department of Health	7.85	3.65
Judicial Branch	9.00	2.14
Information Technology Department	205.20	4.69
Job Service	28.75	5.17
Department of Human Services	35.00	4.88
Department of Transportation	29.85	7.86

"COOKS" measures the excess count of individuals beyond the FTE effort level required for a particular function. For example, an agency might have 5.5 FTE of server administration performed by 8 staff. Because a minimum of 6 individuals could do the work, the COOKS number would be 2.

This number is not meaningful for very small IT organizations. We present the average number here for ND agencies with 4 or more IT FTE, including shadow staff.

Discussion of each agency with an average COOKS number greater than 2 follows.

Discussion			
Office of Management and Budget	19.49	2.88	Has only 2 IT staff, relies heavily on shadow staff for most IT support functions
Attorney General	8.00	3.35	Largely due to allocation of IT staff for agency applications and end-user application support
Secretary of State	4.61	3.58	Has no IT staff, relies on 8 shadow staff for all IT support except development of agency applications
Department of Health	7.85	3.65	The department has chosen to distribute most IT functions very broadly across IT staff
Judicial Branch	9.00	2.14	Again, COOKS numbers are relatively high for most functions
Information Technology Department	205.20	4.69	Given the large size of this department, COOKS numbers are low with the exception of the following IT planning and administrative functions:
Strategic planning	6.10	19	
Project management	9.70	15	
Administrative support	7.90	16	
Departmental management	9.40	22	
Job Service	28.75	5.17	This department has 14 shadow staff, mostly at the field offices, who perform small amounts of customer service functions
Help Desk (Tier 1)	2.73	19	
Workstation support (Tier 2)	2.39	17	
End user application support	2.00	17	
Training	0.39	10	
Department of Human Services	35.00	4.88	DHS has chosen to distribute customer service and IT procurement functions widely across its IT staff
Help Desk (Tier 1)	6.00	21	
Workstation support (Tier 2)	6.95	8	
End user application support	11.25	15	
Training	0.40	7	
IT procurement	0.80	13	
Department of Transportation	29.85	7.86	This agency has chosen to distribute nearly every IT function it performs across multiple staff

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C. ITD AND AGENCY LABOR COSTS FOR IT SERVICES

This section presents additional analysis regarding ITD and agency labor costs for certain IT services. Our first chart looks at mainframe hosting service, also know as data center operations.

Data Center Operations Labor Costs

Agency	Data Center Ops		
	DCO FTE	DCO labor cost	DCO cost per FTE
TOTALS: 23 agencies w/o DCO staff	0.00	\$0	\$0
TOTALS: agencies with < 0.25 FTE DCO staff	0.70	\$42,439	\$60,628
TOTALS agencies with >0.25 FTE DCO staff	6.76	\$354,388	\$52,419
Information Technology Department	14.30	\$731,900	\$51,182
TOTAL	21.76	\$1,128,727	\$51,870

Many agencies reported no data center operations (DCO) staff to support their distributed hosting requirements. Only three agencies reported any significant levels of DCO staff.

Conclusions:

- 1) Data Center Operations is already largely centralized in the state.
- 2) DCO costs at Job Service and BND reflect their use of proprietary platforms to run key agency applications.
- 3) OMB's DCO costs are high due to its reliance on shadow staff to perform this function.
- 4) ITD's DCO costs are largely a function of operating its IBM mainframe environment.

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Our next chart analyzes storage management services.

Storage Management Labor Costs

Agency	Storage Management		
	Storage Mgt. FTE	Storage Mgt. labor \$	Cost per FTE
TOTALS: 24 agencies with 0 FTE	0.00	\$0	\$0
TOTALS: agencies with <0.10 FTE	0.36	\$21,244	\$59,012
Water Commission	0.10	\$6,182	\$61,822
Workforce Safety and Insurance	0.10	\$7,833	\$78,333
Job Service	0.35	\$17,042	\$48,691
TOTALS: agencies with >0.10 FTE	0.55	\$31,057	\$56,468
Information Technology Department	1.90	\$148,000	\$77,895
TOTAL	2.81	\$200,302	\$71,282

Many agencies report no storage management labor at all, and only 3 of them report greater than 0.10 FTE.

Conclusions:

- 1) Storage management is fairly centralized at the state.
- 2) ITD has a higher labor cost per FTE to provide this service than the agencies.
- 3) Given the low overall labor effort assigned to this function, decisions around consolidation will have little overall labor cost impact.

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This final chart takes a look at disaster recovery management.

Disaster Recovery Management Labor Costs

Agency	Disaster Recovery Management		
	DRM FTE	DRM labor cost	DRM cost per FTE
TOTALS: 11 agencies with 0 DRM staff	0.00	\$0	\$0
TOTALS: agencies with < 0.10 FTE DRM staff	0.66	\$41,982	\$64,094
Bank of North Dakota	0.10	\$7,089	\$70,890
Housing Finance Agency	0.10	\$5,607	\$56,067
Water Commission	0.13	\$7,576	\$58,280
Judicial Branch	0.15	\$9,264	\$61,759
Attorney General	0.18	\$9,379	\$52,108
Office of Management and Budget	0.18	\$9,245	\$51,360
Workforce Safety and Insurance	0.30	\$23,292	\$77,641
Department of Transportation	0.50	\$36,215	\$72,430
TOTALS: agencies with > 0.10 FTE DRM staff	1.64	\$107,667	\$65,651
Information Technology Department	1.10	\$76,800	\$69,818
TOTAL	1.76	\$149,649	\$85,270

Several agencies reported no labor assigned to IT disaster recovery management (DRM) and only eight agencies reported more than 0.10 FTE.

Conclusions:

- 1) Agencies do not devote much labor effort to DRM.
- 2) Cost per FTE at the agencies is somewhat higher for this function than most others, in large part because it appears to be done by senior staff.

D. STAFFING SUMMARY SHEETS

The remainder of this appendix presents summary sheets for each participating agency.

Some small agencies which responded have no IT staff, and have no one person who spends more than 10% of his or her time on IT support. These agencies, exempted from the analysis, were:

- ◆ Children's Services Coordinating Committee
- ◆ Department of Financial Institutions
- ◆ Labor Department

The Office of the Adjutant General was exempted because their computer systems are under military control. Higher Education was exempted because they could not provide data in a timely manner, and because they will likely do a similar consolidation study on their own.

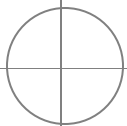
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We did not receive responses from the following agencies:

Agency	2003-05 Budget FTE
Veterans Home	89
Auditor's Office	55
School for the Deaf	51
Seed Department	32
State Library	29
Protection and Advocacy Project	24
Governor	18
Forest Service	18
Securities Commissioner	8
Aeronautics Commission	6
State Treasurer	6
Department of Veterans Affairs	5

Summary staffing information for the remaining agencies is presented on the following pages.



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Agriculture

IT Functions	FTE	Cost
Customer Services		
Help Desk (Tier 1)	0.10	\$ 4,462
Workstation support (Tier 2)	0.09	\$ 4,015
End user application support	0.10	\$ 4,462
Training	0.05	\$ 2,231
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.05	\$ 2,231
File/print administration	0.10	\$ 4,462
Other server administration	0.00	\$ -
Workstation administration	0.10	\$ 4,462
Storage management	0.00	\$ -
Data center operations	0.01	\$ 446
Database administration	0.14	\$ 13,115
Security administration	0.02	\$ 892
Telephone systems support	0.05	\$ 2,231
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.01	\$ 446
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.00	\$ -
IT Administration and Planning		
Strategic planning	0.01	\$ 446
Research and development	0.03	\$ 1,338
Disaster recovery management	0.01	\$ 446
Asset management	0.03	\$ 1,338
IT procurement	0.05	\$ 2,231
Project management	0.05	\$ 2,231
Administrative support	0.05	\$ 2,231
Departmental management	0.00	\$ -

Ttl FTE	1.05
Ttl burdened cost	\$ 53,715
Average unit cost	\$ 51,157
Average JOAT	10

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IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.05	\$ 1,198
Workstation support (Tier 2)	0.02	\$ 479
End user application support	0.00	\$ -
Training	0.00	\$ -
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.02	\$ 479
Storage management	0.02	\$ 479
Data center operations	0.02	\$ 479
Database administration	0.02	\$ 479
Security administration	0.00	\$ -
Telephone systems support	0.01	\$ 240
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.65	\$ 16,639
IT Administration and Planning		
Strategic planning	0.01	\$ 240
Research and development	0.00	\$ -
Disaster recovery management	0.00	\$ -
Asset management	0.00	\$ -
IT procurement	0.01	\$ 240
Project management	0.00	\$ -
Administrative support	0.00	\$ -
Departmental management	0.00	\$ -

Ttl FTE	0.83
Ttl burdened cost	\$20,952
Average unit cost	\$ 25,243
Average JOAT	6

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Attorney General

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.27	\$ 10,264
Workstation support (Tier 2)	0.38	\$ 17,094
End user application support	0.75	\$ 34,265
Training	0.12	\$ 5,120
System Services		
Network connectivity (WAN/LAN/wireless)	0.15	\$ 6,961
<i>Server administration:</i>		
Email administration	0.05	\$ 2,188
File/print administration	0.20	\$ 9,446
Other server administration	0.08	\$ 3,996
Workstation administration	0.14	\$ 6,358
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.06	\$ 2,923
Security administration	0.23	\$ 10,726
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	3.95	\$ 182,187
IT Administration and Planning		
Strategic planning	0.22	\$ 14,426
Research and development	0.24	\$ 13,846
Disaster recovery management	0.18	\$ 9,379
Asset management	0.19	\$ 9,190
IT procurement	0.11	\$ 6,678
Project management	0.40	\$ 25,832
Administrative support	0.02	\$ 743
Departmental management	0.26	\$ 16,998

Ttl FTE	8.00
Ttl Burdened cost	\$388,620
Average unit cost	\$ 48,578
Average JOAT	8

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Bank of North Dakota

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.30	\$ 11,141
Workstation support (Tier 2)	0.70	\$ 29,893
End user application support	0.70	\$ 29,893
Training	0.10	\$ 4,644
System Services		
Network connectivity (WAN/LAN/wireless)	0.20	\$ 10,125
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.30	\$ 14,392
Other server administration	0.15	\$ 7,788
Workstation administration	0.20	\$ 8,185
Storage management	0.00	\$ -
Data center operations	2.00	\$ 81,238
Database administration	0.00	\$ -
Security administration	0.70	\$ 47,093
Telephone systems support	0.11	\$ 3,595
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.05	\$ 3,039
- Payroll	0.10	\$ 6,077
- HR	0.05	\$ 3,039
Agency applications	15.25	\$ 813,749
IT Administration and Planning		
Strategic planning	0.15	\$ 11,633
Research and development	0.40	\$ 21,481
Disaster recovery management	0.10	\$ 7,089
Asset management	0.10	\$ 3,714
IT procurement	0.10	\$ 5,450
Project management	2.25	\$ 266,842
Administrative support	1.00	\$ 31,884
Departmental management	1.80	\$ 121,922

Ttl FTE	26.81
Ttl Burdened cost	\$1,543,904
Average unit cost	\$ 57,587
Average JOAT	2

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IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.15	\$ 7,304
Workstation support (Tier 2)	0.20	\$ 10,008
End user application support	0.20	\$ 9,806
Training	0.02	\$ 1,001
System Services		
Network connectivity (WAN/LAN/wireless)	0.01	\$ 500
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.05	\$ 2,502
Other server administration	0.01	\$ 1,800
Workstation administration	0.30	\$ 15,012
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.40	\$ 23,102
Security administration	0.05	\$ 2,502
Telephone systems support	0.05	\$ 2,502
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.26	\$ 20,154
IT Administration and Planning		
Strategic planning	0.10	\$ 5,309
Research and development	0.05	\$ 2,300
Disaster recovery management	0.01	\$ 500
Asset management	0.02	\$ 1,001
IT procurement	0.03	\$ 1,501
Project management	0.20	\$ 9,353
Administrative support	0.10	\$ 5,309
Departmental management	0.20	\$ 11,327

Ttl FTE	2.41
Ttl burdened cost	\$ 132,793
Average unit cost	\$ 55,101
Average JOAT	5

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Corrections

	FTE TOTAL	Cost TOTAL
IT Functions		
Customer Services		
Help Desk (Tier 1)	1.19	\$ 99,205
Workstation support (Tier 2)	0.12	\$ 11,795
End user application support	0.96	\$ 77,242
Training	0.14	\$ 14,568
System Services		
Network connectivity (WAN/LAN/wireless)	0.16	\$ 14,788
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.00	\$ -
Storage management	0.03	\$ 2,778
Data center operations	0.13	\$ 12,277
Database administration	0.05	\$ 7,059
Security administration	0.07	\$ 7,309
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.35	\$ 38,401
IT Administration and Planning		
Strategic planning	0.05	\$ 7,059
Research and development	0.07	\$ 9,139
Disaster recovery management	0.06	\$ 8,099
Asset management	0.11	\$ 12,065
IT procurement	0.05	\$ 7,059
Project management	0.03	\$ 4,235
Administrative support	0.23	\$ 30,160
Departmental management	0.20	\$ 28,236

Ttl FTE	4
Ttl burdened cost	\$391,473
Average unit cost	\$97,868
Average JOAT	14

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Emergency Management

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.10	\$ 4,605
Workstation support (Tier 2)	0.10	\$ 4,605
End user application support	0.10	\$ 4,605
Training	0.05	\$ 2,303
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.00	\$ -
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.00	\$ -
Telephone systems support	0.03	\$ 1,382
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.00	\$ -
IT Administration and Planning		
Strategic planning	0.01	\$ 461
Research and development	0.00	\$ -
Disaster recovery management	0.01	\$ 461
Asset management	0.01	\$ 461
IT procurement	0.02	\$ 921
Project management	0.00	\$ -
Administrative support	0.01	\$ 461
Departmental management	0.01	\$ 461

Ttl FTE	0.45
Ttl burdened cost	\$20,723
Average unit cost	\$46,052
Average JOAT	11

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Game & Fish

	FTE TOTAL	Cost TOTAL
IT Functions		
Customer Services		
Help Desk (Tier 1)	0.25	\$ 13,325
Workstation support (Tier 2)	0.00	\$ -
End user application support	0.30	\$ 16,050
Training	0.10	\$ 5,375
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.10	\$ 5,375
Other server administration	0.00	\$ -
Workstation administration	0.20	\$ 10,600
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.10	\$ 5,300
Telephone systems support	0.10	\$ 5,300
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.00	\$ -
IT Administration and Planning		
Strategic planning	0.09	\$ 4,905
Research and development	0.05	\$ 2,725
Disaster recovery management	0.01	\$ 545
Asset management	0.01	\$ 545
IT procurement	0.17	\$ 9,265
Project management	0.40	\$ 21,725
Administrative support	0.12	\$ 6,465
Departmental management	0.00	\$ -

Ttl FTE	2
Ttl burdened cost	\$107,500
Average unit cost	\$53,750
Average JOAT	10

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Health

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.46	\$ 22,532
Workstation support (Tier 2)	0.97	\$ 49,981
End user application support	1.32	\$ 68,632
Training	0.56	\$ 28,480
System Services		
Network connectivity (WAN/LAN/wireless)	0.04	\$ 2,093
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.24	\$ 11,816
Workstation administration	0.45	\$ 22,705
Storage management	0.06	\$ 3,107
Data center operations	0.02	\$ 975
Database administration	0.35	\$ 18,313
Security administration	0.07	\$ 3,645
Telephone systems support	0.01	\$ 495
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	1.59	\$ 88,700
IT Administration and Planning		
Strategic planning	0.63	\$ 35,663
Research and development	0.07	\$ 3,450
Disaster recovery management	0.07	\$ 3,668
Asset management	0.07	\$ 3,563
IT procurement	0.10	\$ 5,138
Project management	0.62	\$ 33,226
Administrative support	0.00	\$ -
Departmental management	0.15	\$ 9,005

Ttl FTE	7.85
Ttl burdened cost	\$ 415,188
Average unit cost	\$ 52,890
Average JOAT	8

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Highway Patrol

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.15	\$ 7,271
Workstation support (Tier 2)	0.60	\$ 28,816
End user application support	0.40	\$ 20,853
Training	0.20	\$ 10,033
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.25	\$ 12,215
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.05	\$ 2,508
Telephone systems support	0.05	\$ 2,424
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	1.25	\$ 61,445
IT Administration and Planning		
Strategic planning	0.20	\$ 12,283
Research and development	0.04	\$ 2,232
Disaster recovery management	0.02	\$ 1,003
Asset management	0.13	\$ 6,690
IT procurement	0.06	\$ 3,572
Project management	0.35	\$ 20,370
Administrative support	0.00	\$ -
Departmental management	0.25	\$ 15,354

FTE Sum	4
Burdened cost	\$207,068
Average unit cost	\$51,767
Average JOAT	9

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IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.00	\$ -
Workstation support (Tier 2)	0.10	\$ 4,811
End user application support	0.00	\$ -
Training	0.00	\$ -
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.00	\$ -
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.00	\$ -
Telephone systems support	0.05	\$ 2,406
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.00	\$ -
IT Administration and Planning		
Strategic planning	0.00	\$ -
Research and development	0.00	\$ -
Disaster recovery management	0.00	\$ -
Asset management	0.00	\$ -
IT procurement	0.00	\$ -
Project management	0.00	\$ -
Administrative support	0.00	\$ -
Departmental management	0.00	\$ -

Ttl FTE	0.15
Ttl burdened cost	\$7,217
Average unit cost	\$48,113
Average JOAT	2

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Housing

	FTE TOTAL	Cost TOTAL
IT Functions		
Customer Services		
Help Desk (Tier 1)	0.05	\$ 2,803
Workstation support (Tier 2)	0.10	\$ 5,776
End user application support	0.65	\$ 37,119
Training	0.00	\$ -
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.02	\$ 1,121
File/print administration	0.02	\$ 1,121
Other server administration	0.08	\$ 4,485
Workstation administration	0.00	\$ -
Storage management	0.06	\$ 3,364
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.02	\$ 1,121
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.75	\$ 44,583
IT Administration and Planning		
Strategic planning	0.10	\$ 5,607
Research and development	0.01	\$ 561
Disaster recovery management	0.10	\$ 5,607
Asset management	0.01	\$ 561
IT procurement	0.03	\$ 1,682
Project management	0.00	\$ -
Administrative support	0.00	\$ -
Departmental management	0.00	\$ -
Ttl FTE	2	
Ttl burdened cost		\$115,511
Average unit cost		\$57,756
Average JOAT	2	

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Human Services

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	6.00	\$ 282,145
Workstation support (Tier 2)	6.95	\$ 316,027
End user application support	11.25	\$ 479,330
Training	0.40	\$ 20,726
System Services		
Network connectivity (WAN/LAN/wireless)	0.10	\$ 5,306
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.30	\$ 15,919
Other server administration	0.05	\$ 2,653
Workstation administration	0.00	\$ -
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.15	\$ 7,960
Telephone systems support	0.05	\$ 2,391
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	2.30	\$ 117,378
IT Administration and Planning		
Strategic planning	0.55	\$ 39,613
Research and development	0.10	\$ 5,371
Disaster recovery management	0.00	\$ -
Asset management	0.10	\$ 5,109
IT procurement	0.80	\$ 37,711
Project management	3.70	\$ 223,501
Administrative support	0.90	\$ 28,335
Departmental management	1.30	\$ 91,622

Ttl FTE	35.00
Ttl burdened cost	\$1,681,098
Average unit cost	\$ 48,031
Average JOAT	4

**IT Organization
 and Management
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Appendix B:
 IT Staffing Detail

Indian Affairs

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.02	\$ 878
Workstation support (Tier 2)	0.07	\$ 3,074
End user application support	0.05	\$ 2,195
Training	0.01	\$ 439
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.05	\$ 2,195
Storage management	0.01	\$ 439
Data center operations	0.01	\$ 439
Database administration	0.00	\$ -
Security administration	0.01	\$ 439
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.00	\$ -
IT Administration and Planning		
Strategic planning	0.01	\$ 439
Research and development	0.01	\$ 439
Disaster recovery management	0.01	\$ 439
Asset management	0.01	\$ 439
IT procurement	0.01	\$ 439
Project management	0.01	\$ 439
Administrative support	0.01	\$ 439
Departmental management	0.03	\$ 1,317

Ttl FTE	0.33
Ttl burdened cost	\$14,490
Average unit cost	\$43.909
Average JOAT	16

Industrial & Commercial

IT Organization and Management Study

Appendix B:
IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.20	\$ 10,132
Workstation support (Tier 2)	0.12	\$ 5,371
End user application support	0.26	\$ 12,817
Training	0.25	\$ 11,186
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.18	\$ 8,767
Storage management	0.04	\$ 1,789
Data center operations	0.03	\$ 1,341
Database administration	0.05	\$ 2,234
Security administration	0.10	\$ 4,946
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.93	\$ 53,430
IT Administration and Planning		
Strategic planning	0.08	\$ 3,577
Research and development	0.27	\$ 14,441
Disaster recovery management	0.07	\$ 3,368
Asset management	0.03	\$ 1,343
IT procurement	0.05	\$ 2,237
Project management	0.23	\$ 13,841
Administrative support	0.02	\$ 895
Departmental management	0.09	\$ 6,158

Ttl FTE	3.00
Ttl burdened cost	\$ 157,871
Average unit cost	\$ 52,624
Average JOAT	12

Information Technology

IT Organization and Management Study

Appendix B:
IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	4.20	\$ 236,600
Workstation support (Tier 2)	1.80	\$ 108,000
End user application support	0.40	\$ 24,750
Training	0.70	\$ 41,400
System Services		
Network connectivity (WAN/LAN/wireless)	17.90	\$ 1,109,500
<i>Server administration:</i>		
Email administration	2.30	\$ 157,600
File/print administration	1.50	\$ 91,500
Other server administration	7.45	\$ 492,875
Workstation administration	0.30	\$ 18,200
Storage management	1.90	\$ 148,000
Data center operations	14.30	\$ 731,900
Database administration	6.00	\$ 418,500
Security administration	3.00	\$ 213,500
Telephone systems support	4.70	\$ 244,200
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	4.36	\$ 270,335
- Payroll	4.06	\$ 251,935
- HR	2.08	\$ 132,230
Agency applications	90.25	\$ 5,624,325
IT Administration and Planning		
Strategic planning	6.10	\$ 540,250
Research and development	2.30	\$ 183,150
Disaster recovery management	1.10	\$ 76,800
Asset management	0.70	\$ 42,700
IT procurement	0.80	\$ 47,700
Project management	9.70	\$ 739,900
Administrative support	7.90	\$ 446,900
Departmental management	9.40	\$ 740,850

Ttl FTE	205.20
Ttl burdened cost	\$ 13,133,600
Average unit cost	\$ 64,004
Average JOAT	2

**IT Organization
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Appendix B:
 IT Staffing Detail

Job Services

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	2.73	\$ 117,966
Workstation support (Tier 2)	2.39	\$ 105,321
End user application support	2.00	\$ 92,285
Training	0.39	\$ 16,478
System Services		
Network connectivity (WAN/LAN/wireless)	0.13	\$ 7,509
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.03	\$ 1,861
Other server administration	0.10	\$ 7,434
Workstation administration	0.50	\$ 24,471
Storage management	0.35	\$ 17,042
Data center operations	2.51	\$ 103,632
Database administration	1.85	\$ 115,511
Security administration	0.30	\$ 16,511
Telephone systems support	0.99	\$ 41,152
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.28	\$ 17,182
- HR	0.00	\$ -
Agency applications	8.59	\$ 490,954
IT Administration and Planning		
Strategic planning	1.15	\$ 81,427
Research and development	0.05	\$ 3,856
Disaster recovery management	0.05	\$ 3,325
Asset management	0.09	\$ 6,298
IT procurement	0.24	\$ 14,214
Project management	2.64	\$ 179,082
Administrative support	0.40	\$ 14,670
Departmental management	0.99	\$ 65,738

Ttl FTE	28.75
Ttl burdened cost	\$1,543,920
Average unit cost	\$53,702
Average JOAT	4

**IT Organization
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Appendix B:
 IT Staffing Detail

Judicial

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	1.15	\$ 46,281
Workstation support (Tier 2)	0.63	\$ 28,509
End user application support	1.14	\$ 55,422
Training	0.65	\$ 25,142
System Services	0	\$ -
Network connectivity (WAN/LAN/wireless)	0.15	\$ 8,436
<i>Server administration:</i>		
Email administration	0.16	\$ 9,012
File/print administration	0.23	\$ 13,004
Other server administration	0.22	\$ 12,470
Workstation administration	0.23	\$ 12,921
Storage management	0.07	\$ 3,987
Data center operations	0.21	\$ 11,810
Database administration	0.05	\$ 2,764
Security administration	0.05	\$ 2,882
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	2.44	\$ 131,731
IT Administration and Planning		
Strategic planning	0.27	\$ 18,409
Research and development	0.29	\$ 16,641
Disaster recovery management	0.15	\$ 9,264
Asset management	0.02	\$ 1,400
IT procurement	0.10	\$ 6,174
Project management	0.39	\$ 25,095
Administrative support	0.10	\$ 7,002
Departmental management	0.30	\$ 20,268

Ttl FTE	9
Ttl burdened cost	\$468,623
Average unit cost	\$52,063
Average JOAT	8

**IT Organization
 and Management
 Study**

Appendix B:
 IT Staffing Detail

Land

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.03	\$ 928
Workstation support (Tier 2)	0.07	\$ 2,164
End user application support	0.20	\$ 6,436
Training	0.02	\$ 618
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.06	\$ 1,855
Other server administration	0.00	\$ -
Workstation administration	0.10	\$ 3,092
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.12	\$ 3,962
Security administration	0.10	\$ 3,092
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.70	\$ 25,176
IT Administration and Planning		
Strategic planning	0.11	\$ 3,906
Research and development	0.10	\$ 3,597
Disaster recovery management	0.00	\$ -
Asset management	0.07	\$ 2,164
IT procurement	0.02	\$ 618
Project management	0.00	\$ -
Administrative support	0.00	\$ -
Departmental management	0.00	\$ -

Ttl FTE	1.7
Ttl burdened cost	\$57,607
Average unit cost	\$33,886
Average JOAT	8

**IT Organization
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Appendix B:
 IT Staffing Detail

Legislative

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.41	\$ 22,609
Workstation support (Tier 2)	0.28	\$ 15,235
End user application support	0.30	\$ 16,924
Training	0.57	\$ 35,131
System Services		
Network connectivity (WAN/LAN/wireless)	0.05	\$ 2,470
<i>Server administration:</i>		
Email administration	0.06	\$ 3,064
File/print administration	0.06	\$ 3,064
Other server administration	0.06	\$ 3,064
Workstation administration	0.26	\$ 13,495
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.06	\$ 3,064
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	2.60	\$ 273,805
IT Administration and Planning		
Strategic planning	0.16	\$ 11,928
Research and development	0.12	\$ 7,385
Disaster recovery management	0.06	\$ 4,019
Asset management	0.10	\$ 6,197
IT procurement	0.15	\$ 10,476
Project management	0.10	\$ 7,455
Administrative support	0.10	\$ 6,749
Departmental management	0.10	\$ 7,455

Ttl FTE	5.60
Ttl burdened cost	\$ 453,586
Average unit cost	\$ 81,062
Average JOAT	5

**IT Organization
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Appendix B:
 IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.05	\$ 3,930
Workstation support (Tier 2)	0.10	\$ 7,860
End user application support	0.05	\$ 3,930
Training	0.00	\$ -
System Services		
Network connectivity (WAN/LAN/wireless)	0.01	\$ 786
<i>Server administration:</i>		
Email administration	0.01	\$ 786
File/print administration	0.01	\$ 786
Other server administration	0.03	\$ 2,358
Workstation administration	0.05	\$ 3,930
Storage management	0.05	\$ 3,930
Data center operations	0.04	\$ 3,144
Database administration	0.13	\$ 9,330
Security administration	0.05	\$ 3,930
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.40	\$ 29,460
IT Administration and Planning		
Strategic planning	0.05	\$ 3,930
Research and development	0.05	\$ 3,930
Disaster recovery management	0.05	\$ 3,930
Asset management	0.05	\$ 3,930
IT procurement	0.05	\$ 3,930
Project management	0.05	\$ 3,930
Administrative support	0.05	\$ 3,930
Departmental management	0.05	\$ 3,930

Ttl FTE	1.38
Ttl burdened cost	\$ 105,600
Average unit cost	\$ 76,800
Average JOAT	12

Office of Management and Budget

IT Organization and Management Study

Appendix B:
IT Staffing Detail

	FTE TOTAL	Cost TOTAL
IT Functions		
Customer Services		
Help Desk (Tier 1)	0.27	\$ 10,759
Workstation support (Tier 2)	0.40	\$ 16,019
End user application support	0.45	\$ 17,639
Training	0.10	\$ 4,074
System Services		
Network connectivity (WAN/LAN/wireless)	0.25	\$ 13,365
<i>Server administration:</i>		
Email administration	0.07	\$ 2,740
File/print administration	0.08	\$ 3,185
Other server administration	0.00	\$ -
Workstation administration	0.26	\$ 10,370
Storage management	0.00	\$ -
Data center operations	2.25	\$ 169,517
Database administration	0.00	\$ -
Security administration	0.02	\$ 759
Telephone systems support	0.24	\$ 12,370
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	3.87	\$ 224,866
- Payroll	2.35	\$ 108,164
- HR	2.00	\$ 138,268
Agency applications	3.65	\$ 205,278
IT Administration and Planning		
Strategic planning	0.28	\$ 16,916
Research and development	0.23	\$ 14,920
Disaster recovery management	0.18	\$ 9,245
Asset management	0.15	\$ 6,297
IT procurement	0.28	\$ 15,784
Project management	0.45	\$ 36,448
Administrative support	1.10	\$ 31,134
Departmental management	0.56	\$ 35,313

Ttl FTE	19.49
Ttl burdened cost	\$ 1,103,430
Average unit cost	\$ 56,610
Overall Average JOAT	2

**IT Organization
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 Study**

Appendix B:
 IT Staffing Detail

Parks and Recreation

	FTE TOTAL	Cost TOTAL
IT Functions		
Customer Services		
Help Desk (Tier 1)	0.13	\$ 5,295
Workstation support (Tier 2)	0.40	\$ 16,371
End user application support	0.08	\$ 3,274
Training	0.05	\$ 2,046
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.05	\$ 2,046
Other server administration	0.00	\$ -
Workstation administration	0.15	\$ 6,139
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.01	\$ 409
Telephone systems support	0.13	\$ 5,254
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.25	\$ 12,019
IT Administration and Planning		
Strategic planning	0.03	\$ 1,376
Research and development	0.02	\$ 819
Disaster recovery management	0.04	\$ 1,933
Asset management	0.02	\$ 819
IT procurement	0.02	\$ 614
Project management	0.07	\$ 3,161
Administrative support	0.02	\$ 808
Departmental management	0.13	\$ 6,799

Ttl FTE	1.60
Ttl burdened cost	\$ 69,182
Average unit cost	\$ 43,374
Average JOAT	6

Public Instruction

	FTE TOTAL	Cost TOTAL
IT Functions		
Customer Services		
Help Desk (Tier 1)	0.10	\$ 4,418
Workstation support (Tier 2)	1.00	\$ 43,692
End user application support	0.70	\$ 29,927
Training	0.50	\$ 21,090
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.00	\$ -
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.00	\$ -
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	4.00	\$ 295,592
IT Administration and Planning		
Strategic planning	0.10	\$ 7,037
Research and development	0.00	\$ -
Disaster recovery management	0.00	\$ -
Asset management	0.10	\$ 4,418
IT procurement	0.10	\$ 4,418
Project management	0.30	\$ 17,357
Administrative support	0.00	\$ -
Departmental management	0.80	\$ 56,294

Ttl FTE	7.70
Ttl burdened cost	\$ 484,244
Average unit cost	\$ 62.889
Average JOAT	2

Public Service Commission

**IT Organization
 and Management
 Study**

Appendix B:
 IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.05	\$ 2,746
Workstation support (Tier 2)	0.02	\$ 1,370
End user application support	0.20	\$ 11,663
Training	0.00	\$ -
System Services		
Network connectivity (WAN/LAN/wireless)	0.01	\$ 685
<i>Server administration:</i>		
Email administration	0.01	\$ 685
File/print administration	0.10	\$ 6,849
Other server administration	0.01	\$ 685
Workstation administration	0.10	\$ 6,849
Storage management	0.01	\$ 685
Data center operations	0.00	\$ -
Database administration	0.03	\$ 1,783
Security administration	0.02	\$ 1,370
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.80	\$ 44,211
IT Administration and Planning		
Strategic planning	0.15	\$ 10,274
Research and development	0.12	\$ 8,219
Disaster recovery management	0.05	\$ 3,425
Asset management	0.02	\$ 1,370
IT procurement	0.05	\$ 3,425
Project management	0.10	\$ 6,849
Administrative support	0.05	\$ 3,425
Departmental management	0.10	\$ 6,849

Ttl FTE	2.00
Ttl Burdened cost	\$ 123,415
Average unit cost	\$ 61,708
Average JOAT	12

Public Employees Retirement System

IT Organization and Management Study

Appendix B:
IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.08	\$ 3,875
Workstation support (Tier 2)	0.10	\$ 4,873
End user application support	0.15	\$ 7,368
Training	0.00	\$ 129
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.07	\$ 3,224
Other server administration	0.05	\$ 2,495
Workstation administration	0.12	\$ 5,993
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.06	\$ 3,019
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.86	\$ 41,144
IT Administration and Planning		
Strategic planning	0.08	\$ 3,977
Research and development	0.52	\$ 24,498
Disaster recovery management	0.05	\$ 2,380
Asset management	0.03	\$ 1,452
IT procurement	0.06	\$ 2,879
Project management	0.57	\$ 27,543
Administrative support	0.10	\$ 5,240
Departmental management	0.10	\$ 5,240

Ttl FTE	3.00
Ttl Burdened cost	\$ 145,329
Average unit cost	\$ 48,395
Average JOAT	14

Retirement and Investment Office

IT Organization and Management Study

Appendix B:
IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.04	\$ 2,061.84
Workstation support (Tier 2)	0.02	\$ 1,030.92
End user application support	0.06	\$ 3,007.98
Training	0.00	\$ -
System Services		
Network connectivity (WAN/LAN/wireless)	0.01	\$ 557.85
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.03	\$ 1,588.76
Other server administration	0.01	\$ 557.85
Workstation administration	0.04	\$ 2,061.84
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.02	\$ 1,030.92
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	1.55	\$79,260.30
IT Administration and Planning		
Strategic planning	0.08	\$ 4,293.22
Research and development	0.03	\$ 1,673.54
Disaster recovery management	0.02	\$ 1,115.69
Asset management	0.01	\$ 557.85
IT procurement	0.01	\$ 557.85
Project management	0.00	\$ -
Administrative support	0.02	\$ 946.14
Departmental management	0.05	\$ 2,789.23

Ttl FTE	2.00
Ttl Burdened cost	\$ 103,092
Average unit cost	\$ 51,546
Average JOAT	12

School for the Blind

IT Organization and Management Study

Appendix B:
IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.05	\$ 2,400
Workstation support (Tier 2)	0.00	\$ -
End user application support	0.00	\$ -
Training	0.00	\$ -
System Services		
Network connectivity (WAN/LAN/wireless)	0.02	\$ 960
<i>Server administration:</i>		
Email administration	0.02	\$ 960
File/print administration	0.02	\$ 960
Other server administration	0.04	\$ 1,920
Workstation administration	0.50	\$ 20,100
Storage management	0.00	\$ -
Data center operations	0.05	\$ 2,400
Database administration	0.15	\$ 7,200
Security administration	0.05	\$ 2,400
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.00	\$ -
IT Administration and Planning		
Strategic planning	0.05	\$ 2,400
Research and development	0.00	\$ -
Disaster recovery management	0.00	\$ -
Asset management	0.00	\$ -
IT procurement	0.00	\$ -
Project management	0.00	\$ -
Administrative support	0.05	\$ 1,750
Departmental management	0.05	\$ 2,400

Ttl FTE	1.05
Ttl burdened cost	\$ 45,850
Average unit cost	\$ 43,667
Average JOAT	7

**IT Organization
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Appendix B:
 IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.10	\$ 3,985
Workstation support (Tier 2)	0.10	\$ 3,985
End user application support	0.25	\$ 12,316
Training	0.12	\$ 6,209
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.40	\$ 15,938
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.32	\$ 14,109
Security administration	0.00	\$ -
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	2.45	\$ 144,793
IT Administration and Planning		
Strategic planning	0.48	\$ 36,239
Research and development	0.00	\$ -
Disaster recovery management	0.06	\$ 2,839
Asset management	0.03	\$ 1,291
IT procurement	0.04	\$ 2,042
Project management	0.26	\$ 14,442
Administrative support	0.00	\$ -
Departmental management	0.00	\$ -

Ttl FTE	4.61
Ttl burdened cost	\$ 258,187
Average unit cost	\$ 56,067
Average JOAT	6

**IT Organization
 and Management
 Study**

Appendix B:
 IT Staffing Detail

Tax

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.00	\$ -
Workstation support (Tier 2)	0.05	\$ 2,652
End user application support	0.40	\$ 18,613
Training	0.00	\$ -
System Services		
Network connectivity (WAN/LAN/wireless)	0.02	\$ 1,061
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.03	\$ 1,591
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.02	\$ 1,375
Security administration	0.10	\$ 5,304
Telephone systems support	0.04	\$ 1,818
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
State-wide applications:		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	3.47	\$ 174,412
IT Administration and Planning		
Strategic planning	0.03	\$ 2,462
Research and development	0.05	\$ 2,652
Disaster recovery management	0.02	\$ 1,061
Asset management	0.02	\$ 1,061
IT procurement	0.02	\$ 757
Project management	0.10	\$ 6,715
Administrative support	0.00	\$ -
Departmental management	0.15	\$ 12,311

Ttl FTE	4.51
Ttl burdened cost	\$ 233,845
Average unit cost	\$ 51,844
Average JOAT	3

**IT Organization
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Appendix B:
 IT Staffing Detail

Transportation

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	2.39	\$ 114,401
Workstation support (Tier 2)	3.00	\$ 157,686
End user application support	0.39	\$ 22,204
Training	0.35	\$ 19,341
System Services		
Network connectivity (WAN/LAN/wireless)	0.45	\$ 25,145
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	1.90	\$ 95,829
Storage management	0.01	\$ 686
Data center operations	0.00	\$ -
Database administration	0.83	\$ 45,447
Security administration	0.13	\$ 8,326
Telephone systems support	0.65	\$ 32,623
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.08	\$ 5,297
- Payroll	0.02	\$ 1,196
- HR	0.07	\$ 4,414
Agency applications	9.30	\$ 524,497
IT Administration and Planning		
Strategic planning	1.42	\$ 100,140
Research and development	1.27	\$ 76,100
Disaster recovery management	0.50	\$ 36,215
Asset management	0.65	\$ 33,033
IT procurement	0.79	\$ 47,470
Project management	2.93	\$ 193,275
Administrative support	0.80	\$ 37,368
Departmental management	1.92	\$ 151,556

Ttl FTE	29.85
Ttl burdened cost	\$ 1,732,249
Average unit cost	\$ 58,032
Average JOAT	6

Vocational Education

IT Organization and Management Study

Appendix B:
IT Staffing Detail

	FTE TOTAL	Cost TOTAL
IT Functions: "Shadow" Staff		
Customer Services		
Help Desk (Tier 1)	0.08	\$ 3,255
Workstation support (Tier 2)	0.08	\$ 2,806
End user application support	0.04	\$ 1,515
Training	0.00	\$ -
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.00	\$ -
Other server administration	0.00	\$ -
Workstation administration	0.00	\$ -
Storage management	0.00	\$ -
Data center operations	0.00	\$ -
Database administration	0.00	\$ -
Security administration	0.00	\$ -
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.00	\$ -
IT Administration and Planning		
Strategic planning	0.00	\$ -
Research and development	0.00	\$ -
Disaster recovery management	0.00	\$ -
Asset management	0.00	\$ -
IT procurement	0.00	\$ -
Project management	0.00	\$ -
Administrative support	0.00	\$ -
Departmental management	0.00	\$ -

Ttl FTE	0.20
Ttl Burdened cost	\$ 7,576
Average unit cost	\$ 37,881
Average JOAT	3

Water Commission

IT Organization and Management Study

Appendix B:
IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.12	\$ 6,615
Workstation support (Tier 2)	0.12	\$ 6,615
End user application support	0.12	\$ 6,615
Training	0.04	\$ 2,205
System Services		
Network connectivity (WAN/LAN/wireless)	0.00	\$ -
<i>Server administration:</i>		
Email administration	0.00	\$ -
File/print administration	0.03	\$ 1,788
Other server administration	0.03	\$ 1,788
Workstation administration	0.20	\$ 11,023
Storage management	0.10	\$ 6,182
Data center operations	0.03	\$ 2,058
Database administration	0.10	\$ 6,182
Security administration	0.02	\$ 1,372
Telephone systems support	0.00	\$ -
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	0.50	\$ 30,383
IT Administration and Planning		
Strategic planning	0.15	\$ 10,290
Research and development	0.05	\$ 3,430
Disaster recovery management	0.13	\$ 7,576
Asset management	0.04	\$ 2,744
IT procurement	0.08	\$ 4,810
Project management	0.05	\$ 3,430
Administrative support	0.04	\$ 2,744
Departmental management	0.02	\$ 1,372

Ttl FTE	1.97
Ttl Burdened cost	\$ 119,223
Average unit cost	\$ 60,519
Average JOAT	12

Workforce Safety

IT Organization and Management Study

Appendix B:
IT Staffing Detail

IT Functions	FTE TOTAL	Cost TOTAL
Customer Services		
Help Desk (Tier 1)	0.70	\$ 22,270
Workstation support (Tier 2)	0.65	\$ 25,557
End user application support	0.60	\$ 24,101
Training	0.40	\$ 22,413
System Services		
Network connectivity (WAN/LAN/wireless)	0.05	\$ 3,917
<i>Server administration:</i>		
Email administration	0.05	\$ 3,917
File/print administration	0.10	\$ 6,123
Other server administration	0.70	\$ 34,779
Workstation administration	0.44	\$ 17,450
Storage management	0.10	\$ 7,833
Data center operations	0.15	\$ 7,071
Database administration	0.85	\$ 62,449
Security administration	0.60	\$ 42,657
Telephone systems support	0.10	\$ 2,838
Business Application Services		
<i>Application development, deployment, & maintenance:</i>		
<i>State-wide applications:</i>		
- Finance	0.00	\$ -
- Payroll	0.00	\$ -
- HR	0.00	\$ -
Agency applications	12.88	\$ 731,795
IT Administration and Planning		
Strategic planning	0.55	\$ 51,616
Research and development	0.15	\$ 10,613
Disaster recovery management	0.30	\$ 23,292
Asset management	0.05	\$ 2,207
IT procurement	0.25	\$ 18,894
Project management	1.55	\$ 132,698
Administrative support	0.40	\$ 13,849
Departmental management	0.80	\$ 77,187

Ttl FTE	22.42
Ttl burdened cost	\$ 1,345,525
Average unit cost	\$ 60,028
Average JOAT	4

**IT Organization
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Appendix B:
IT Staffing Detail

E. DESKTOP SERVICES ANALYSIS DETAIL

The table presented below provides the salary ranges and burden assumptions for help desk staff that PTI used to perform the desktop services analysis.

Help Desk Salary Ranges				
Position	Base	OMB low (1.38)	OMB mid (1.41)	ITD (1.45)
Existing Network Help Desk	\$ 38,534	\$ 53,178	\$ 54,334	\$ 55,875
Existing Tier 2	\$ 33,621	\$ 46,397	\$ 47,405	\$ 48,750
Existing Help Desk Manager	\$ 45,172	\$ 62,338	\$ 63,693	\$ 65,500
New Support Tech II	\$ 30,000	\$ 41,400	\$ 42,300	\$ 43,500
New Support Tech III	\$ 35,000	\$ 48,300	\$ 49,350	\$ 50,750
New Help Desk Supervisor	\$ 43,000	\$ 59,340	\$ 60,630	\$ 62,350
New Help Desk Manager	\$ 50,000	\$ 69,000	\$ 70,500	\$ 72,500

The following section presents the detail behind the desktop services analysis, organized as follows:

- ◆ Scenario A
- ◆ Scenario B
- ◆ Scenario C

SCENARIO A

Scenario A Help Desk Organization					
FTE	Position	Base	OMB low (1.38)	OMB mid (1.41)	ITD (1.45)
4	Existing Network Help Desk	\$ 154,138	\$ 212,710	\$ 217,334	\$ 223,500
1	Existing Tier 2	\$ 33,621	\$ 46,397	\$ 47,405	\$ 48,750
1	Existing Help Desk Manager	\$ 45,172	\$ 62,338	\$ 63,693	\$ 65,500
7	New Support Tech II	\$ 210,000	\$ 289,800	\$ 296,100	\$ 304,500
6	New Support Tech III	\$ 210,000	\$ 289,800	\$ 296,100	\$ 304,500
2	New Help Desk Supervisor	\$ 86,000	\$ 118,680	\$ 121,260	\$ 124,700
0	New Help Desk Manager	\$ -	\$ -	\$ -	\$ -
21	TOTALS	\$ 738,931	\$ 1,019,725	\$ 1,041,893	\$ 1,071,450

FTE Percentage Assigned to Desktop Support			
FTE	Position	Percentage	Desktop FTE
4	Existing Network Help Desk	100%	4.00
1	Existing Tier 2	100%	1.00
1	Existing Help Desk Manager	0%	0.00
7	New Support Tech II	100%	7.00
6	New Support Tech III	100%	6.00
2	New Help Desk Supervisor	50%	1.00
0	New Help Desk Manager	0%	0.00
21	TOTALS		19.00

Scenario A Summary		
Desktop Support Levels	Current	Future
Agency desktop support FTE	45.27	27.40
ITD desktop support FTE	6.30	19.00
TOTAL	51.57	46.40
PC's Per Support FTE	149	165

Desktop Support Costs	Current	Future
Agency desktop support	\$ 2,143,979	\$ 1,288,619
ITD desktop support	\$ 362,800	\$ 1,041,893
TOTAL	\$ 2,506,779	\$ 2,330,512
Savings (1.41 burden)	\$ 176,266	

Savings Range	
Savings (1.38 burden)	\$ 198,434
Savings (1.45 burden)	\$ 146,709

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Appendix B:
 IT Staffing Detail

SCENARIO B

Scenario B Help Desk Organization					
FTE	Position	Base	OMB low (1.38)	OMB mid (1.41)	ITD (1.45)
4	Existing Network Help Desk	\$ 154,138	\$ 212,710	\$ 217,334	\$ 223,500
1	Existing Tier 2	\$ 33,621	\$ 46,397	\$ 47,405	\$ 48,750
1	Existing Help Desk Manager	\$ 45,172	\$ 62,338	\$ 63,693	\$ 65,500
9	New Support Tech II	\$ 270,000	\$ 372,600	\$ 380,700	\$ 391,500
8	New Support Tech III	\$ 280,000	\$ 386,400	\$ 394,800	\$ 406,000
2	New Help Desk Supervisor	\$ 86,000	\$ 118,680	\$ 121,260	\$ 124,700
0	New Help Desk Manager	\$ -	\$ -	\$ -	\$ -
25 TOTALS		\$ 868,931	\$ 1,199,125	\$ 1,225,193	\$ 1,259,950

FTE Percentage Assigned to Desktop Support		
FTE	Position	Desktop FTE
4	Existing Network Help Desk	4.00
1	Existing Tier 2	1.00
1	Existing Help Desk Manager	0.00
9	New Support Tech II	9.00
8	New Support Tech III	8.00
2	New Help Desk Supervisor	1.00
0	New Help Desk Manager	0.00
25 TOTALS		23.00

Scenario B Summary		
Desktop Support Levels	Current	Future
Agency desktop support FTE	45.27	20.03
ITD desktop support FTE	6.30	23.00
TOTAL	51.57	43.03
PC's Per Support FTE	149	178

Desktop Support Costs	Current	Future
Agency desktop support	\$ 2,143,979	\$ 937,790
ITD desktop support	\$ 362,800	\$ 1,225,193
TOTAL	\$ 2,506,779	\$ 2,162,983
Savings (1.41 burden)	\$ 343,796	

Savings Range	
Savings (1.38 burden)	\$ 369,864
Savings (1.45 burden)	\$ 309,039

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Appendix B:
IT Staffing Detail

SCENARIO C

Scenario C Help Desk Organization					
FTE	Position	Base	OMB low (1.38)	OMB mid (1.41)	ITD (1.45)
4	Existing Network Help Desk	\$ 154,138	\$ 212,710	\$ 217,334	\$ 223,500
1	Existing Tier 2	\$ 33,621	\$ 46,397	\$ 47,405	\$ 48,750
1	Existing Help Desk Manager	\$ 45,172	\$ 62,338	\$ 63,693	\$ 65,500
16	New Support Tech II	\$ 480,000	\$ 662,400	\$ 676,800	\$ 696,000
15	New Support Tech III	\$ 525,000	\$ 724,500	\$ 740,250	\$ 761,250
4	New Help Desk Supervisor	\$ 172,000	\$ 237,360	\$ 242,520	\$ 249,400
0	New Help Desk Manager	\$ -	\$ -	\$ -	\$ -
41 TOTALS		\$ 1,409,931	\$ 1,945,705	\$ 1,988,003	\$ 2,044,400

FTE Percentage Assigned to Desktop Support		
FTE	Position	Desktop FTE
4	Existing Network Help Desk	4.00
1	Existing Tier 2	1.00
1	Existing Help Desk Manager	0.00
16	New Support Tech II	16.00
15	New Support Tech III	15.00
4	New Help Desk Supervisor	2.00
0	New Help Desk Manager	0.00
41 TOTALS		38.00

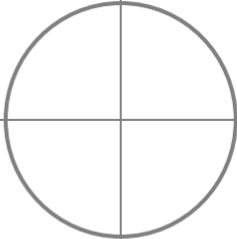
Scenario C Summary		
Desktop Support Levels	Current	Future
Agency desktop support FTE	45.27	0.00
ITD desktop support FTE	6.30	38.00
TOTAL	51.57	38.00
PC's Per Support FTE	149	202

Desktop Support Costs	Current	Future
Agency desktop support	\$ 2,143,979	\$ -
ITD desktop support	\$ 362,800	\$ 1,988,003
TOTAL	\$ 2,506,779	\$ 1,988,003
Savings (1.41 burden)	\$	518,776

Savings Range	
Savings (1.38 burden)	\$ 561,074
Savings (1.45 burden)	\$ 462,379

APPENDIX

C



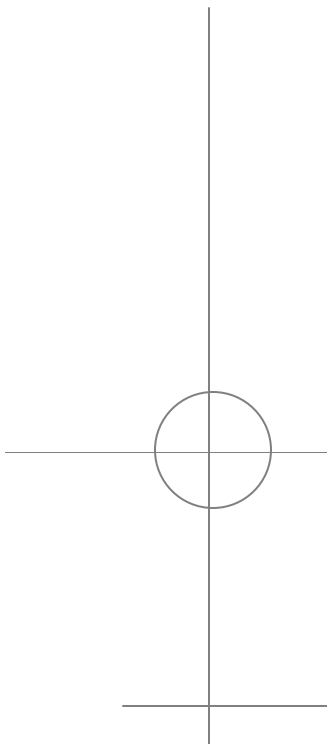
survey results

This appendix provides additional data behind the nation-wide survey analysis presented in Chapter 2 of this report. Pacific Technologies conducted in-depth surveys with seven states, and a high-level survey with an additional 24 states. This appendix is organized as follows:

- ◆ In-depth survey data
- ◆ High-level survey data

A. IN DEPTH SURVEY DATA

The following pages present the state-by-state summaries of data collected from the 7 in-depth survey respondents. Note that most tables are incomplete – they present the data made available from the respondents.



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Appendix C:
Survey Results

Connecticut

Metric	Statewide
Population	3,300,000
Executive FTEs	50,000
Executive Ops Budget	13,000,000,000
Judicial FTEs	
Judicial Ops Budget	
Legislative FTEs	
Legislative Budget	
Self-supporting Executive Departments	

	Central IT			Executive IT		
	Values	Per Capita	Per FTE	Values	Per Capita	Per FTE
FTEs	240	0.0001	0.0048	790	0.0002	0.0158
Salary		-	-		-	-
Ops Budget	45,000,000	13.6364	900.0000	200,000,000	60.6061	4,000.0000
Supported Workstations		-	-		-	-
Customer Support FTEs		-	-		-	-
Customer Support Salary		-	-		-	-
Customer Support Outsource		-	-		-	-
Number of File/Print Servers		-	-		-	-
Number of E-mail Servers		-	-		-	-
Number of Web Servers		-	-		-	-
Number of Mainframes		-	-		-	-
Number of Midrange Servers		-	-		-	-
Number of Other Intel Servers		-	-		-	-
Number of Data Centers		-	-		-	-
Number of State Employees with Direct Network Access		-	-		-	-
System Services FTEs		-	-		-	-
System Services Salary		-	-		-	-
System Services Outsource		-	-		-	-
Application Support FTEs		-	-		-	-
Application Support Salary		-	-		-	-
Application Support Outsource		-	-		-	-
Administration Support FTEs		-	-		-	-
Administration Support Salary		-	-		-	-
Administration Support Outsource		-	-		-	-

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Kansas

Metric	Statewide
Population	2,688,418
Executive FTEs	35,225
Executive Ops Budget	9,800,000,000
Judicial FTEs	1,820
Judicial Ops Budget	93,300,000
Legislative FTEs	109
Legislative Budget	23,700,000
Self-supporting Executive Departments	Transportation, Health & Environment, Human Resources, Social & Rehab

	Central IT			Executive IT		
	Values	Per Capita	Per FTE	Values	Per Capita	Per FTE
FTEs	219	0.0001	0.0062	1,342	0.0005	0.0381
Salary	7,117,000	2.6473	202.0440	36,600,000	13.6140	1,039.0348
Ops Budget	34,600,000	12.8700	982.2569	116,000,000	43.1481	3,293.1157
Supported Workstations	816	0.0003	0.0232	58944	0.0219	1.6734
Customer Support FTEs	30	0.0000	0.0009	-	-	-
Customer Support Salary	-	-	-	-	-	-
Customer Support Outsource	-	-	-	-	-	-
Number of File/Print Servers	-	-	-	1500	0.0006	0.0426
Number of E-mail Servers	-	-	-	-	-	-
Number of Web Servers	-	-	-	-	-	-
Number of Mainframes	1	0.0000	0.0000	5	0.0000	0.0001
Number of Midrange Servers	-	-	-	175	0.0001	0.0050
Number of Other Intel Servers	-	-	-	-	-	-
Number of Data Centers	-	-	-	10	0.0000	0.0003
Number of State Employees with Direct Network Access	-	-	-	-	-	-
System Services FTEs	-	-	-	-	-	-
System Services Salary	-	-	-	-	-	-
System Services Outsource	-	-	-	-	-	-
Application Support FTEs	-	-	-	-	-	-
Application Support Salary	-	-	-	-	-	-
Application Support Outsource	-	-	-	-	-	-
Administration Support FTEs	-	-	-	-	-	-
Administration Support Salary	-	-	-	-	-	-
Administration Support Outsource	-	-	-	-	-	-

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Appendix C:
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Kentucky

Metric	Statewide
Population	4,041,769
Executive FTEs	39,000
Executive Ops Budget	14,000,000,000
Judicial FTEs	
Judicial Ops Budget	
Legislative FTEs	
Legislative Budget	
Self-supporting Executive Departments	

	Central IT			Executive IT		
	Values	Per Capita	Per FTE	Values	Per Capita	Per FTE
FTEs	424	0.0001	0.0109	1,200	0.0003	0.0308
Salary	30,000,000	7.4225	769.2308	62,400,000	15.4388	1,600.0000
Ops Budget	62,000,000	15.3398	1,589.7436	200,000,000	49.4833	5,128.2051
Supported Workstations	-	-	-	-	-	-
Customer Support FTEs	-	-	-	-	-	-
Customer Support Salary	-	-	-	-	-	-
Customer Support Outsource	-	-	-	-	-	-
Number of File/Print Servers	-	-	-	-	-	-
Number of E-mail Servers	-	-	-	-	-	-
Number of Web Servers	-	-	-	-	-	-
Number of Mainframes	-	-	-	-	-	-
Number of Midrange Servers	-	-	-	-	-	-
Number of Other Intel Servers	-	-	-	-	-	-
Number of Data Centers	-	-	-	-	-	-
Number of State Employees with Direct Network Access	-	-	-	-	-	-
System Services FTEs	-	-	-	-	-	-
System Services Salary	-	-	-	-	-	-
System Services Outsource	-	-	-	-	-	-
Application Support FTEs	-	-	-	-	-	-
Application Support Salary	-	-	-	-	-	-
Application Support Outsource	-	-	-	-	-	-
Administration Support FTEs	-	-	-	-	-	-
Administration Support Salary	-	-	-	-	-	-
Administration Support Outsource	-	-	-	-	-	-

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**Appendix C:
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Missouri

Metric	Statewide
Population	5,595,211
Executive FTEs	52,517
Executive Ops Budget	17,842,800,000
Judicial FTEs	3,809
Judicial Ops Budget	
Legislative FTEs	680
Legislative Budget	
Self-supporting Executive Departments	

	Central IT			Executive IT		
	Values	Per Capita	Per FTE	Values	Per Capita	Per FTE
FTEs	99	0.0000	0.0019	1,350	0.0002	0.0257
Salary	4,019,198	0.7183	76.5314	62,615,773	11.1910	1,192.2953
Ops Budget	12,544,000	2.2419	238.8560	155,582,910	27.8064	2,962.5247
Supported Workstations	806	0.0001	0.0153	29082	0.0052	0.5538
Customer Support FTEs	46	0.0000	0.0009	-	-	-
Customer Support Salary	2,001,448	0.3577	38.1105	-	-	-
Customer Support Outsource	-	-	-	-	-	-
Number of File/Print Servers	-	-	-	-	-	-
Number of E-mail Servers	2	0.0000	0.0000	145	0.0000	0.0028
Number of Web Servers	-	-	-	-	-	-
Number of Mainframes	2	0.0000	0.0000	-	-	-
Number of Midrange Servers	-	-	-	57	0.0000	0.0011
Number of Other Intel Servers	-	-	-	1451	0.0003	0.0276
Number of Data Centers	1	0.0000	0.0000	-	-	-
Number of State Employees with Direct Network Access	44,000	0.0079	0.8378	-	-	-
System Services FTEs	-	-	-	-	-	-
System Services Salary	-	-	-	-	-	-
System Services Outsource	-	-	-	-	-	-
Application Support FTEs	46	0.0000	0.0009	-	-	-
Application Support Salary	3,181,425	0.5686	60.5790	-	-	-
Application Support Outsource	-	-	-	-	-	-
Administration Support FTEs	7	0.0000	0.0001	-	-	-
Administration Support Salary	351,475	0.0628	6.6926	-	-	-
Administration Support Outsource	-	-	-	-	-	-

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North Carolina

Metric	Statewide
Population	8,049,313
Executive FTEs	73,355
Executive Ops Budget	5,575,000,000
Judicial FTEs	5,540
Judicial Ops Budget	374,000,000
Legislative FTEs	1,000
Legislative Budget	36,200,000
Self-supporting Executive Departments	Transportation, Human Services, Corrections, Revenue, Public Instruction, Natural Resources

	Central IT			Executive IT		
	Values	Per Capita	Per FTE	Values	Per Capita	Per FTE
FTEs	424	0.0001	0.0058	2,026	0.0003	0.0276
Salary	29,400,000	3.6525	400.7907	14,700,000	1.8262	200.3953
Ops Budget	145,000,000	18.0140	1,976.6887	403,000,000	50.0664	5,493.8314
Supported Workstations	364	0.0000	0.0050	46176	0.0057	0.6295
Customer Support FTEs	35	0.0000	0.0005	-	-	-
Customer Support Salary	2,000,000	0.2485	27.2647	-	-	-
Customer Support Outsource	100,000	0.0124	1.3632	-	-	-
Number of File/Print Servers	2	0.0000	0.0000	850	0.0001	0.0116
Number of E-mail Servers	23	0.0000	0.0003	-	-	-
Number of Web Servers	50	0.0000	0.0007	-	-	-
Number of Mainframes	2	0.0000	0.0000	1	0.0000	0.0000
Number of Midrange Servers	-	-	-	107	0.0000	0.0015
Number of Other Intel Servers	17	0.0000	0.0002	1426	0.0002	0.0194
Number of Data Centers	1	0.0000	0.0000	1	0.0000	0.0000
Number of State Employees with Direct Network Access	400	0.0000	0.0055	-	-	-
System Services FTEs	276	0.0000	0.0038	-	-	-
System Services Salary	19,500,000	2.4226	265.8306	-	-	-
System Services Outsource	700,000	0.0870	9.5426	-	-	-
Application Support FTEs	20	0.0000	0.0003	-	-	-
Application Support Salary	200,000	0.0248	2.7265	-	-	-
Application Support Outsource	-	-	-	-	-	-
Administration Support FTEs	93	0.0000	0.0013	-	-	-
Administration Support Salary	5,900,000	0.7330	80.4308	-	-	-
Administration Support Outsource	400,000	0.0497	5.4529	-	-	-

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Appendix C:
Survey Results

South Dakota

Metric	Statewide
Population	754,844
Total State FTEs	13,294
Total State Ops Budget	2,245,391,000
Judicial FTEs	
Judicial Ops Budget	
Legislative FTEs	
Legislative Budget	
Self-supporting Executive Departments	Regents (University)

	Central IT			Executive IT		
	Values	Per Capita	Per State FTE	Values	Per Capita	Per State FTE
FTEs	276	0.0004	0.0208	-	-	-
Salary	14,874,000	19.7047	1,118.8506	-	-	-
Ops Budget	38,174,000	50.5720	2,871.5210	-	-	-
Supported Workstations	7,913	0.0105	0.5952	-	-	-
Customer Support FTEs	60	0.0001	0.0045	-	-	-
Customer Support Salary	2,858,702	3.7871	215.0370	-	-	-
Customer Support Outsource	-	-	-	-	-	-
Number of File/Print Servers	-	-	-	-	-	-
Number of E-mail Servers	-	-	-	-	-	-
Number of Web Servers	-	-	-	-	-	-
Number of Mainframes	1	0.0000	0.0001	-	-	-
Number of Midrange Servers	12	0.0000	0.0009	-	-	-
Number of Other Intel Servers	29	0.0000	0.0022	-	-	-
Number of Data Centers	1	0.0000	0.0001	-	-	-
Number of State Employees with Direct Network Access	7,913	0.0105	0.5952	-	-	-
System Services FTEs	72	0.0001	0.0054	-	-	-
System Services Salary	3,979,000	5.2713	299.3080	-	-	-
System Services Outsource	-	-	-	-	-	-
Application Support FTEs	112	0.0001	0.0084	-	-	-
Application Support Salary	6,388,000	8.4627	480.5175	-	-	-
Application Support Outsource	6,000,000	7.9487	451.3314	-	-	-
Administration Support FTEs	16	0.0000	0.0012	-	-	-
Administration Support Salary	6,879,000	9.1131	517.4515	-	-	-
Administration Support Outsource	-	-	-	-	-	-

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Appendix C:
Survey Results

B. HIGH-LEVEL SURVEY DATA

This section summarizes data collected in support of the high-level survey. In conducting the surveys, Pacific Technologies asked all participants (high-level and detailed) a set of questions intended to gather information on expected, near-term changes in level of consolidation of IT services, as well as the expected level of consolidation. The table below presents a state-by-state summary of direction of change and expected level centralization. Note that not all respondents provided data in all areas.

Direction and Level of Consolidation by State

State	Customer Service		System Services		Application Support		IT Administration	
	Direction	% Cent.	Direction	% Cent.	Direction	% Cent.	Direction	% Cent.
Arkansas	No Change	70	No Change	60	No Change	20	No Change	100
California	Consolidating	80	Consolidating	80	No Change	20	Consolidating	100
Colorado	No Change	25	No Change	35	No Change	15	No Change	10
Connecticut	N/A	65	N/A	70	N/A	40	N/A	100
Florida	Consolidating	80	Consolidating	80	Consolidating	75	Consolidating	75
Georgia	No Change	35	No Change	90	No Change	20	No Change	95
Idaho	Consolidating		Consolidating		No Change		Consolidating	
Iowa	No Change	20	No Change	20	No Change	20	No Change	20
Kansas	N/A		N/A		N/A		N/A	
Kentucky	N/A		N/A		N/A		N/A	
Louisiana	Consolidating		Consolidating		No Change		Consolidating	
Maine	Consolidating	65	Consolidating	65	Consolidating	65	Consolidating	65
Minnesota	No Change	1	Consolidating		Consolidating	5	Consolidating	35
Missouri	N/A		N/A		N/A		N/A	
Montana	No Change	100	No Change	50	No Change	10	No Change	100
Nevada	N/A	40	N/A	80	No Change		No Change	75
New Hampshire	Consolidating	10	Consolidating	100	Consolidating	100	Consolidating	100
New Jersey	No Change		Consolidating	85	No Change		No Change	
New Mexico	No Change		Consolidating	25	Consolidating	25	Consolidating	35
New York	No Change		Consolidating	75	No Change	25	Consolidating	75
North Carolina	Consolidating		Consolidating		No Change		N/A	
NORTH DAKOTA	Consolidating	10	Consolidating	65	No Change	50	Consolidating	40
Ohio	Consolidating	80	No Change		Consolidating	20	Consolidating	70
Oklahoma	No Change		Consolidating		Consolidating	50	Consolidating	60
Oregon	Consolidating	10	Consolidating	10	No Change		Consolidating	30
Pennsylvania	Consolidating	15	Consolidating	50	Consolidating	10	Consolidating	50
Rhode Island	Consolidating	80	Consolidating	80	Consolidating	50	Consolidating	90
South Carolina	Decentralizing	5	Consolidating	20	Consolidating	20	Decentralizing	
South Dakota	No Change	100	No Change	100	No Change	100	No Change	100
Utah	Decentralizing	5	Decentralizing	5	Decentralizing	5	N/A	50
West Virginia	Consolidating	70	Consolidating	100	Consolidating		Consolidating	90
Wyoming	N/A		N/A		N/A		N/A	

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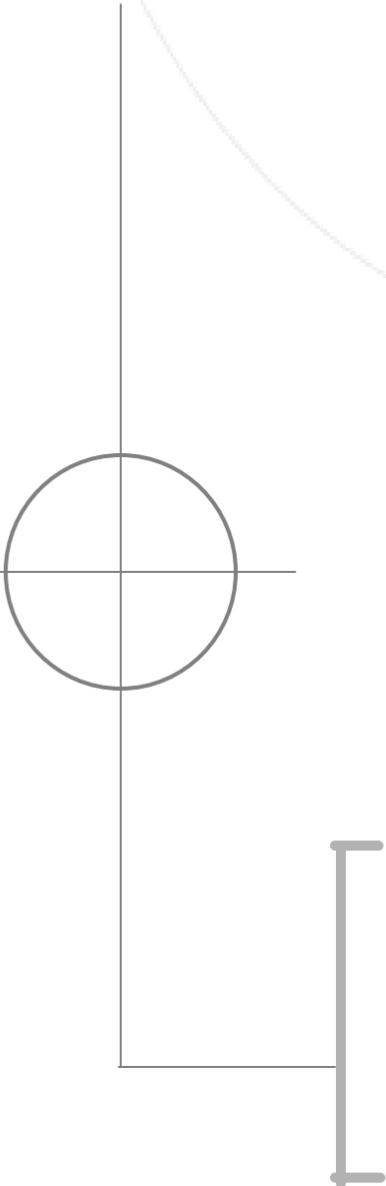
The table below presents a summary of the respondents' progress on projects similar to North Dakota's enterprise-wide initiatives.

Progress Toward North Dakota's Enterprise Initiatives by State

STATE	PROJECT				
	WAN	ERP	CJIS	GIS	EA
Arkansas	In Place	In Place	In Progress	In Place	In Place
California	In Progress	Not Started	Not Started	Not Started	Not Started
Colorado	In Place	Not Started	In Place	Not Started	In Place
Conneticut	In Place	In Place	In Progress	Not Started	In Place
Florida	In Place	In Place	In Place	Not Started	In Place
Georgia	In Place	In Place	In Progress	Not Started	In Progress
Idaho	In Place	In Place	Not Started	In Progress	In Place
Iowa	In Place	In Place	In Place	Not Started	Not Started
Kansas	In Place	In Place	In Place	In Progress	In Place
Kentucky	In Place	In Place	In Place	In Progress	In Place
Louisiana	In Place	In Place	Not Started	Not Started	In Place
Maine	In Place	Not Started	In Place	In Place	In Place
Minnesota	In Place	Not Started	In Progress	In Progress	In Progress
Missouri	In Place	In Place	In Place	Not Started	In Place
Montana					
Nevada	In Place	Not Started	In Progress	Not Started	Not Started
New Hampshire	In Place	Not Started	In Progress	Not Started	Not Started
New Jersey					
New Mexico	In Place	Not Started	Not Started	Not Started	In Place
New York	In Place	In Progress	In Place	In Place	In Progress
North Carolina	In Place	Not Started	Not Started	In Place	In Place
NORTH DAKOTA	In Place	In Place	In Progress	In Place	In Place
Ohio	In Place	In Progress	In Progress	Not Started	Not Started
Oklahoma	In Place	In Place	Not Started	Not Started	In Progress
Oregon	In Place	In Place	Not Started	In Place	Not Started
Pennsylvania	In Place	In Place	In Place	Not Started	In Place
Rhode Island	In Place	In Place	In Place	Not Started	Not Started
South Carolina	In Place	In Place	In Place	Not Started	In Place
South Dakota	In Place	Not Started		In Place	In Place
Utah	In Place	Not Started		In Place	
West Virginia	In Progress	Not Started	In Progress	Not Started	In Place
Wyoming	In Place	In Place	In Progress	Not Started	Not Started

APPENDIX

D



**full consolidation
analysis**

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Appendix D:
Full Consolidation
Analysis

This appendix provides a brief summary of a service delivery alternative not discussed in the report – complete consolidation of IT services at the State.

As part of this planning effort, Pacific Technologies was asked to explore several options for providing IT services at the State, including a federated approach, a completely centralized approach, and a completely distributed approach. The majority of this report discusses variations on the federated model. The completely distributed model was deemed impractical, against current public sector trends, and only useful from an academic viewpoint – and therefore we left it largely unexamined.

We also did not choose to pursue a completely consolidated approach, though it warranted some level of examination. The table below presents an analysis of how adding the consolidation of IT Planning and Administration and Business Application functions would impact the scenarios presented in Chapter 3 of this report:

Complete Consolidation Impacts

Consolidated Functions	NEW FTE's	NEW Labor Costs	Savings	Comments
Business Application Services				
Agency applications	171.35	\$ 10,678,237	\$ 62,319	
IT Administration and Planning				
Strategic planning	7.45	\$ 659,814	\$ 88,566	* reduced by 6 FTE
Research and development	6.80	\$ 541,168	\$ 79,630	
Disaster recovery management	3.29	\$ 229,423	\$ 69,818	
Asset management	2.95	\$ 180,011	\$ 61,000	
IT procurement	2.65	\$ 157,768	\$ 59,625	* reduced by 2 FTE
Project management	27.30	\$ 2,082,399	\$ 76,278	
Administrative support	8.57	\$ 485,028	\$ 56,570	* reduced by 5 FTE
Departmental management	19.93	\$ 1,570,838	\$ 78,814	
Total before centralization	263.28	\$ 16,610,764		
Total after centralization	250.28	\$ 16,584,686		
NET	13.00	\$ 26,078		

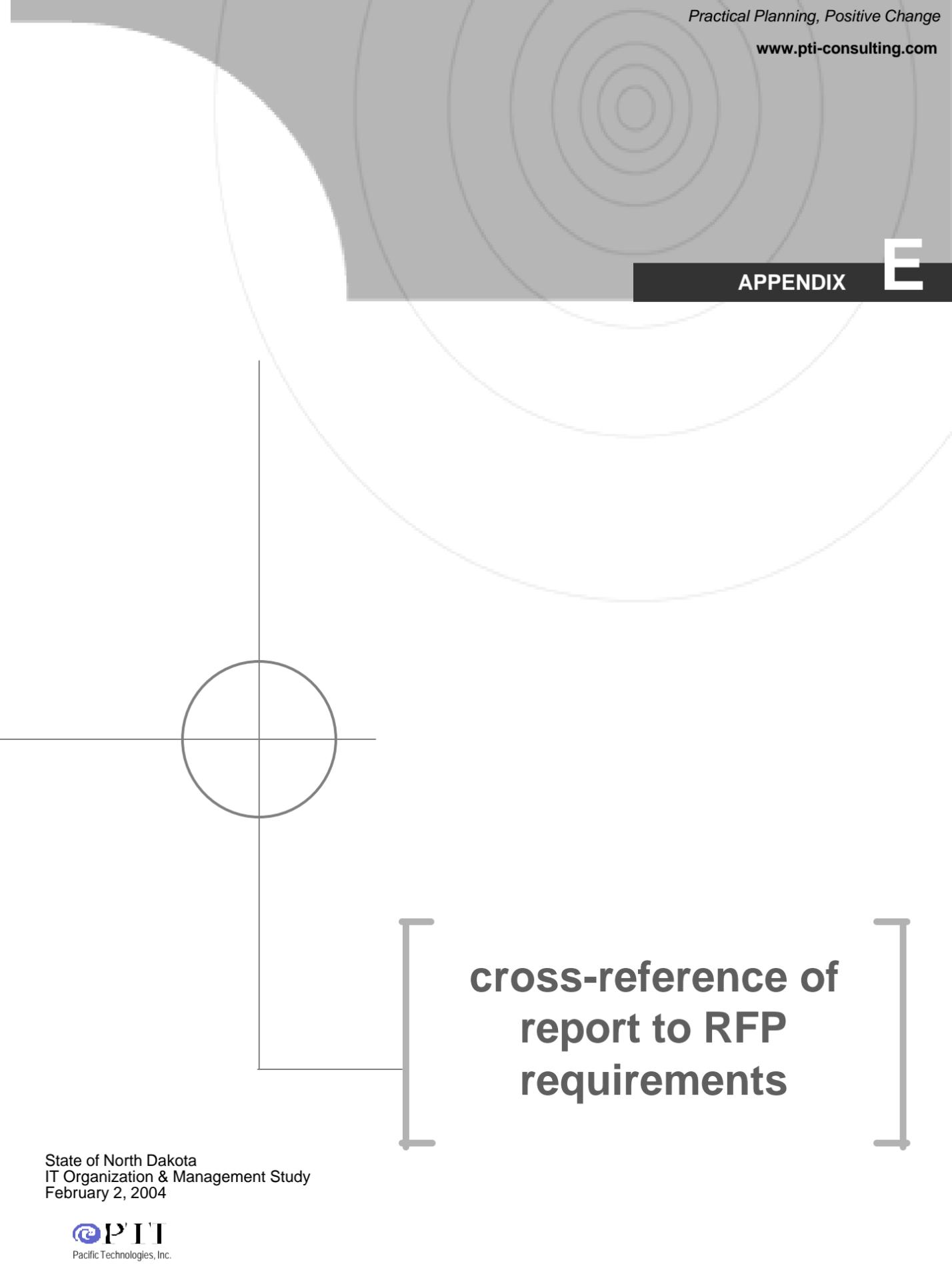
The net impact of the recommendation is a mere **savings of approximately \$26,000**. Even though staffing costs are reduced in this scenario, the higher average salary in ITD compared to the agencies offsets most of the associated cost savings opportunity.

Pacific Technologies elected to not examine this alternative for several reasons:

- ◆ The resulting cost savings is very small – well within the margin of error inherent in the self reported data
- ◆ Consolidating agency application support is not a widely embraced practice
- ◆ Agency involvement in IT Administration and Planning functions is necessary to ensure IT continues to support business objectives

APPENDIX

E



**cross-reference of
report to RFP
requirements**

**IT Organization
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Appendix E:
Cross-Reference of
Report to RFP
Requirements

This appendix cross references the RFP requirements to the contents of Pacific Technologies' report.

RFP Requirement	Report Reference
RFP Section 5.2 – IT Organization Study	
5.2.1. Identification of the cost and benefits of a centralized information technology structure and the cost and benefits of a decentralized information technology structure. This must also address quality of service issues and the advantages/disadvantages of a federated approach.	Chapter 3 of the report addresses consolidation issues, including full centralization/decentralization. Appendix D includes a model of a fully centralized service delivery approach. In discussion with the Interim IT Committee's project manager, we agreed not to model a fully decentralized approach based on the clear impracticality of such an approach. Chapter 2, Section B (IT Organization and Service Deliver), addresses quality of IT service at the State. Our recommended IT service delivery model is federated. The Executive Overview describes the benefits of this approach, while Chapter 3, Section D (Organizational Impacts) describes the associated human resources and management issues.
5.2.2. Identification of the cost of providing electronic mail administration, file and print server administration, seat management and desktop personal computer support, mainframe and distributed computing hosting services, consolidated storage management and disaster recovery, and software development.	Chapter 2, Section B (IT Organization and Service Delivery) provides summarized costs of service, while Appendix B offers detailed costs for all specific areas listed except software development. Software development costs have been grouped with overall agency business application support – a figure that includes maintenance as well as development work.
5.2.3. Identification of the roles and responsibilities of agency personnel providing information technology services under a centralized information technology structure, a decentralized information technology structure, and a federated information technology structure.	Chapter 3, Section D (Organizational Impacts) describes roles and responsibilities relative to our recommendations (i.e., a federated structure). As a centralized model would have ITD responsible for virtually all activities and a decentralized model would have the agencies responsible for virtually all activities, we have not provided additional role and responsibility information for these scenarios.
5.2.4. Identification of the employee positions and competencies needed by the Information Technology Department to provide the information technology services on a centralized basis, including the related organizational changes required within the department. This should also address the employee positions and competencies need by the Information technology Department to provide services on a federated basis.	Chapter 3, Section D (Organizational Impacts) describes the impacted positions, necessary skills, future ITD organization model, and associated roles and responsibilities related to our recommendations.
5.2.5. Identification of the related human resource management issues, including change in management, training, and employee compensation, to be addressed for a successful centralization.	Chapter 3, Section D (Organizational Impacts) describes the human resource and management issues related to our recommendations.
5.2.6. Review the adequacy and quality of the services currently being provided and appropriate performance measures. This includes a review of agencies and the Information Technology Department.	Chapter 2, Section B (IT Organization and Service Delivery) includes a subsection on service quality. This section also includes information on performance measures and adequacy of staffing. Chapter 2, Section E (Survey Results) presents additional performance measure data, including comparisons with other states.
5.2.7. Comparison of current information technology costs to industry data and data from other states. This comparison must clearly define what is included in IT costs and rate structures.	Chapter 2, Section E (Survey Results) compares North Dakota's IT spending, staffing, charges for services, and service delivery position to other states.
5.2.8. Identification of the information technology services that should be performed by individual agency personnel.	Chapter 3, Section D (Organizational Impacts) describes roles and responsibilities of agency staff related to our recommendations.

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Appendix E:
 Cross-Reference of
 Report to RFP
 Requirements

RFP Requirement	Report Reference
5.2.9. Development of a plan to either centralize or decentralize the services identified, including the reorganization tasks, personnel transfers, and changes required for information technology budgeting and cost allocation processes and rate design.	Chapter 3, Section B (Consolidation Recommendations) provides our recommended changes to the State's IT service delivery approach. Chapter 3, Sections G (Transition Approach) and H (Implementation Plan Outline) detail the changes required and the steps necessary to implement the recommendations.
RFP Section 5.3 – IT Management Study	
5.3.1. Review of the technology management processes of other states and private industry with respect to prioritizing information technology budget requests, establishing information technology standards and policies, and overseeing information technology expenditures.	Chapter 2, Section E (Survey Results) presents the results of our survey of other states and research into practices regarding governance, standards and policies, and IT oversight.
5.3.2. Review of the role of other states in providing information technology services to non-state government entities.	Chapter 2, Sections E (Survey Results) and F (Review of State-wide Initiatives) presents the results of our survey of other states and includes information on provision of IT services to non-state government entities.
5.3.3. Review of the level of information technology outsourcing in other state governments and the private sector and the applicability of outsourcing to the state of North Dakota.	Chapter 2, Section E (Survey Results) includes a discussion of outsourcing. Chapter 3, Section B (Consolidation Recommendations) discusses the applicability of outsourcing. Determining whether or not North Dakota should outsource services related to our recommendations is an activity included in our recommended implementation plan in (Chapter 3, Section H (Implementation Plan Outline).
5.3.4. Review of the industry trends that will impact technology deployment and spending in the next 5 to 10 years.	Chapter 2, Section E (Survey Results) includes a subsection on IT industry trends.
5.3.5. Review of the level of coordination in the management of North Dakota enterprise initiatives, such as the statewide wide area network, the enterprise resource planning system initiative, the geographic information system initiative, and the criminal justice information-sharing initiative, compared to other states, including recommendations regarding the appropriate governance structure to provide the maximum benefits to North Dakota.	Chapter 2, Section F (Review of State-wide Initiatives) includes discussion of each listed initiative and related recommendations.
5.3.6. Identify the potential changes to the organization structure of the Information Technology Department and other state government entities as related to information technology management.	Chapter 3, Section D (Organizational Impacts), includes a recommended organization chart for ITD and discusses related issues.
RFP Section 5.5 – Final Report	
5.5 The final result of this study will be a written report. The Legislative Council will also require a formal presentation of the study results to be given to the Information Technology Committee. The content of the report is expected to address all of the areas outlined in Sections 5.2 and 5.3 of this RFP including the following: Specific recommendations related to the organization of information technology services for State of North Dakota including projected costs, benefits, and methods of measuring the results. This includes recommendations as to the services that should be centralized and the services that should be decentralized.	This report documents the results of Pacific Technologies' work, including recommendations in all the areas cited.