

## EXHIBIT A

# City of Portland 2013 Citywide Technology Assessment

## Final Report

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**Sierra Systems**

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## Document History

Author	Version	Date	Comments
S Koorbatoff	0.1	12/13/2013	Initial draft
S Koorbatoff	0.2	12/30/2013	Incorporated city feedback on Task II, Task III, Task V Incorporated summary of recommendations
S Koorbatoff	0.3	12/31/2013	Final Draft (Happy New Year!)
S Koorbatoff	0.4	01/07/2014	Corrections to recommendation numbering
S Koorbatoff	0.5	01/16/2014	Feedback from the City of Portland and final edits

## A. Executive Summary

### Background

In January 2013, BTS issued an RFP for a detailed assessment of the state of city technology and through a competitive process awarded the contract to Sierra Systems to complete a Citywide technology assessment related to the following six focus areas:

1. BTS Organizational Structure, Service Delivery Model and Business Processes
2. Citywide Technology Related Staff Skills & Proficiency
3. Citywide State of Technology
4. BTS Budget and Financial Management Practices
5. Citywide Technology Governance Model
6. Capability Maturity Model Integration (CMMI) Appraisal (Applications Only)

### Approach

Sierra Systems used a similar approach in each focus area including at a high level, completion of a current state assessment, gap analysis and then conclusions and/or recommendations. Every opportunity for input was considered, including expanding the scope of work to ensure comprehensive engagement with the bureaus. A range of techniques was used to gather and validate information and findings, including face-to-face and telephone interviews and meetings, workshops, focus groups, validation sessions, and email and online surveys. In addition, Sierra Systems completed a review of relevant City of Portland materials available and leveraged Forrester leading practices as a benchmark.

### Key Findings

The following is a summary of the key executive-level findings across all focus areas:

- **BTS has absorbed large budget reductions** since 2006
  - Example: Elimination of 38 technology positions, consolidation of infrastructure and applications, reduced spending by over \$11 million
- **Opportunities exist for further improvement**
  - Example: Duplicate application e.g. asset management, document management and archiving, time tracking
- Evidence of a strong working relationship with Bureaus provides a **solid foundation for improved Bureau engagement model to address, however**
  - Limited bureau input into/knowledge of current BTS Strategic Plan 2011-14 and Bureau perception of **lack of transparency**
  - **Limited forums for collaboration** among “like businesses” and Bureaus around common technology service needs and development
- **Governance is seen as an enabler** of effective Citywide technology strategy and management
  - Current state is **deficient in higher-level, Citywide technology governance** to enable bureau input and buy-in to technology direction, priorities and decisions

- The City's 2002 Ordinance 177852 that centralized foundational IT functions in BTS has not been subject to a strategic review in over a decade and warrants a re-fresh. No mechanisms exist to decide what is **centrally managed vs. dispersed or decentralized**.
- A consolidated **citywide funding perspective does not exist** – a pre-requisite to a Citywide return on investment framework
  - There appears to be a **shortfall in Technology spending** compared to leading practices; this shortfall explains some of the challenges facing both BTS and Bureaus; e.g. **lack of business continuity plan**
  - **Considering the shortfall, the City is** maintaining the existing reduced support levels; additional actions can be taken to further enhance both service delivery and cost control
- **BTS faces typical challenges** of the current 'Traditional' organizational model; including silos, duplication, focus on operations vs. strategy
  - The Chief Technology Officer (CTO) is expected by the Bureaus to **provide greater strategic leadership** for Citywide IM/IT (Information Management/Information Technology)
- Executives (BTS and Bureau) do not believe they have an adequate view on the entire investment of IM/IT in the City or the management of IM/IT risk
  - A **citywide Technology Vision and Master Plan** is needed to augment the BTS Strategic Plan; cohesive **Bureau business plans are needed** to inform the Technology Vision and Master Plan
- **Technical Architecture is well defined** and largely consolidated
  - However **other key architectures require attention** (e.g. information and application architecture) resulting in greater complexity; impacts to budgets and resources

## Key Recommendations

Sierra Systems has provided a series of 60 recommendations to be implemented at various levels of the organization from City Council, CAO, and CTO to BLT (BTS Operations – Bureau Leadership Team). The following are the top 5 recommendations at the City Council level:

1. Establish a clear mandate for Bureau collaboration to enable alignment of technology and business strategies and roadmaps
2. Implement a governance structure to support cross-bureau decision making and collaboration
3. Improve funding mechanisms for cross-bureau initiatives
4. Revise CTO title and mandate to include common business solutions and auditing of bureau compliance
5. Clearly define and validate the total citywide technology spend and establish a benchmark for performance – adjust citywide technology spend to align with leading practice

In setting the priority for recommendations, those rated as the highest priority are deemed as foundational or enablers for priorities 2 and 3. A summary of all priority 1 recommendations is provided in section D. A full list of all recommendations is provided in section F.

## B. Background

In January 2013, BTS issued an RFP for a detailed assessment of the state of city technology to address:

- An anticipated continuing decline in funding
- An unsustainable funding practice of tapping into Operating Reserve to complete critical projects
- Needed improvements to operating efficiency with lower costs to complete mission critical capital and operating projects
- An inability to keep up with increasing demand for new services and solutions – demands from bureaus and citizens
- A need to prioritize requests for new services and solutions at the Bureau/Office level and at an enterprise/corporate level

In August 2013, the City of Portland contracted Sierra Systems to complete a Citywide technology assessment including current state assessment, gap analysis and recommendations related to the following six focus areas:

1. BTS Organizational Structure, Service Delivery Model and Business Processes
2. Citywide Technology Related Staff Skills & Proficiency
3. Citywide State of Technology
4. BTS Budget and Financial Management Practices
5. Citywide Technology Governance Model
6. BTS Capability Maturity Model Integration (CMMI) Appraisal (BTS & SAP Applications Only)

This document provides a consolidated report of findings and summary of recommendations across all six focus areas.

## C. Timeline and Approach

### C.1. Timeline

The Citywide Technology Assessment was completed in a compressed schedule over a period of 4 months to meet the budget and timeline constraints of the City of Portland, with the presentation to City Council scheduled to follow the assessment in month 5 (January 2014).

August 19 – October 9	October 16 – November 8	November 10 – December 9	December 10 – January 31
Discovery	Analysis	Report	Recommendations
<ul style="list-style-type: none"> <li>Gathered documents</li> <li>Meetings and review with elected officials, CAO, CTO</li> <li>Meetings and review with BTS and Bureaus</li> <li>Meetings and review with TBCs and Bureau Liaisons</li> <li>Meetings and review with HR, LR, and unions</li> </ul>	<ul style="list-style-type: none"> <li>Survey sent out Skills and Competencies Assessment October 16. <ul style="list-style-type: none"> <li>71% overall response rate</li> </ul> </li> <li>Sent out State of Technology worksheet October 25 <ul style="list-style-type: none"> <li>89% overall response rate</li> </ul> </li> <li>Conducted Community of Interest (Col) and BTS focus groups November 3-7</li> </ul>	<ul style="list-style-type: none"> <li>Analysis of current state</li> <li>Assessment of gaps</li> <li>Review of findings with Project Governance, BTS and Bureaus</li> <li>Developed conclusions</li> <li>Finalized recommendations</li> </ul>	<ul style="list-style-type: none"> <li>Final task deliverables submitted and approved</li> <li>Briefings with Bureau Directors</li> <li>Final consolidated report and recommendations December 31</li> <li>Presentation to City Council January 31</li> </ul>

### C.2. Approach

Sierra Systems used a similar approach in each focus area including at a high level information gathering, completion of a current state assessment, gap analysis and then conclusions and/or recommendations. We took every opportunity for input, expanding the scope of work to ensure comprehensive engagement with the bureaus. A range of techniques was used to gather and validate information and findings, including:

- Worked with stakeholders to assess the current state and capture stakeholder information and views through a series of face-to-face and telephone meetings, interviews and workshops with City Councilors, the CAO and CTO, Bureau Directors and staff, BTS management and staff, BHR management, and unions
- Validated current state and findings via workshops with BTS management and staff
- Engaged collaboratively with Bureau Directors and staff to pilot the proposed Community of Interest (Col) governance model (see section E5) and to collect and validate information and findings via a series of focus groups
- Conducted an email survey of BTS and Bureaus on technology costs, practices and priorities
- Conducted an online survey of citywide technology related staff on skills and competencies
- Completed a review of relevant City of Portland available materials
- Leveraged Forrester leading practices as a benchmark



## D. Summary of Priority 1 Recommendations

In preparing the recommendations for the City of Portland, each recommendation was assessed as to the Class (organizational level who owns the recommendation) and the Priority (1 = highest priority and 3 = lowest priority). Sierra Systems has made assumptions about which level accountabilities for decisions would be most appropriate for the City, which need to be validated by the City.

The following is a summary of the 17 highest priority recommendations by class (the full list of 60 recommendations is in section F). In setting the priority for recommendations, those rated as the highest priority are deemed as foundational or enablers for priority 2 and 3. For example, establishing the new governance structure and validation of the current technology spend is needed before citywide prioritization of technology spend and initiatives can occur.

Recommendations are numbered as **R** (recommendation) – **Txx** (Task number: i.e. TV = Task V) - **##** (all tasks are numbered 01-60 starting with recommendations provided in Task II through to recommendations provided in Task VII). For example, R-TV-45 is Recommendation 45 from Task V.

### D.1. Class I: City Council

Number	Recommendation
R-TV-34	Clearly define and validate the total citywide technology spend and establishing a benchmark for performance, with consistent use of GL (General Ledger) codes to facilitate this analysis
R-TV-44	Consider options for expansion of the citywide Innovation Fund to fund cross-bureau initiatives
R-TV-45	Establish a clear mandate and processes for Bureaus enabling efficiencies through consolidation and collaboration
R-TVI-52	Approve recommended Governance Processes outlined in section E5.4 and move to implementation through drafting of committee Terms of Reference – including issues management and logistics and confirming membership and reporting.
R-TVI-54	Revise CTO title to Chief Information Officer – to better reflect the scope and mandate proposed for this role

### D.2. Class II: Chief Administration Office (CAO)

Number	Recommendation
R-TII-10	Work with Bureaus to build a citywide technology Vision and Master Plan and Bureau business strategy and plan; develop multi-year aligned technology and business roadmap to allow for needed prioritization and simplification of support
R-TV-35	Prioritize major expenditures Citywide (e.g. Business Continuity Plans (BCP))
R-TV-36	Tie major expenditures to a business outcome using a business case approach
R-TVI-32	Prioritize efforts and plan to migrate remaining applications off Mainframe infrastructure – Auditor (LIEN Accounting). Potential for largest annual savings (see section E4.3.6).
R-TVI-53	Renew existing CTO mandate to accommodate/clarify recommended authorities and mandates (see specific recommendations in section E5.4)
R-TII-03	Clearly define role and responsibilities of BTS vs. Bureaus

### D.3. Class III: Chief Technology Officer (CTO)

Number	Recommendation
R-TII-01	Consider implementation of a new organizational model: Plan, Build, Run
R-TII-05	Create and implement a comprehensive change management strategy and plan to support organizational transformation at all levels; communicate with technology staff and Bureaus
R-TVI-25	Ensure business transparency, contribution in technology prioritization process – Community of Interest (CoI)
R-TVII-55	Clarify management commitment to process improvement, identify sponsorship and identify best practices that can be standardized across BTS, in order to address the gaps identified in the CMMI (Capability Maturity Model Integration) study (see section E6).

### D.4. Class IV: BLT (Bureau Leadership Team)

Number	Recommendation
R-TVI-21	Create a comprehensive application rationalization and consolidation program targeting Asset Management, Work Order and Billing Systems including an Asset, Work Order, Billing Community of Interest (CoI)
R-TV-37	Review the cost model for each service; start with high volume and high costs services; assess consistency of methodologies

## E. Findings by Focus Area

### E.1. BTS Organizational Structure, Service Delivery Model and Business Processes (Task II)

#### E.1.1. Overview

The BTS Organizational Structure, Service Delivery Model and Business Processes includes an assessment, findings and recommendations regarding the BTS organizational structure, service delivery model and business processes. Specifically:

- Review the current BTS organizational structure and draft revised organizational structures under consideration. Report on strengths and weaknesses of each draft revised organizational structure as it relates to optimizing service delivery.
- Make recommendations related to optimal management span of control taking into consideration levels of technical contributions currently being provided by each manager and supervisor position.
- Make recommendations as to whether or not specific technical functions currently provided centrally by BTS should be decentralized, a hybrid, or centralized.
- Examine organizational business processes and work practices and identify changes that will result in efficiency improvements and optimization.
- Review the current project service delivery model including accountability for project success and make recommendations that will result in more effective outcomes.
- Assess the working relationships between BTS and its customer bureaus.
- Assess the progress made in technology consolidation in regards to expected benefits and outcomes stated in the 2003 consolidation ordinance.



## E.1.2. Current State Findings

### E.1.2.1. Business Environment and Organizational Goals

The following summary of key themes is the result of interviews with 22 bureaus (directors and staff) conducted between Aug 29th and Sep 25th, 2013.

Question *	# Responses	Key Themes
Q1: How important is IT in the successful delivery of your business and services?	18	<ul style="list-style-type: none"> <li>IT is <b>critical</b> to bureau business and the reliance on IT will <b>continue to grow</b></li> <li>Robust <b>information management</b> is required to support decision making (immediate to long term)</li> <li>IT is key to <b>interfacing with the public</b></li> <li>Public demands and need for cost savings drive a <b>move toward digital processes</b></li> </ul>
Q2: What is your sense of the City-Wide direction and strategy on IT?	14	<ul style="list-style-type: none"> <li>IT strategy is <b>not citywide</b>, some oversight exists</li> <li>Look to <b>BTS to take the lead</b> in setting a <b>vision with Council</b></li> <li>Need <b>robust governance framework for collaboration</b> between bureaus that withstands changes in elected officials</li> </ul>
Q3: How is your Bureau engaged in city-wide IT planning, strategy and investment decisions?	12	<ul style="list-style-type: none"> <li>Bureaus are <b>not engaged</b> in citywide planning or strategy</li> <li>Decisions are made before bureaus are engaged</li> <li>Bureaus <b>use their own strategies</b> and decision processes</li> <li>See <b>value in collaboration</b> and interest groups</li> </ul>
Q4: On City-wide IT governance, what is working? What needs to be improved? What would you like to see in the future ?	14	<ul style="list-style-type: none"> <li>Recent citywide initiatives have seen success (e.g. Office 365, GIS)</li> <li><b>Narrow bureau focus</b>, lack of consistency as elected officials change</li> <li><b>High cost</b> of duplication, bureaucracy, and lack of integration</li> <li><b>BTS as gatekeeper</b> for standards and emerging technologies</li> <li>Need for <b>citywide governance</b> and decision making framework</li> </ul>
Q5: How do you measure the value of BTS and Bureau-specific IT operations in meeting your business needs?	9	<ul style="list-style-type: none"> <li><b>Need for standardization</b> on performance measures, largely anecdotal</li> <li>Existing measures <b>focus on project performance</b> or reduction of manual processes</li> </ul>
Q6: What are your thoughts on the value and risk of IT investments?	10	<ul style="list-style-type: none"> <li>Citywide risk management is <b>inadequate</b></li> <li>IT <b>direction heavily influenced</b> by bureau and political needs</li> <li><b>Lack of clarity</b> on who owns citywide risk management</li> <li><b>BTS to take the lead</b> in citywide IT risk management</li> </ul>
Q7: Key gaps that the City needs to address in order to improve the efficiency and effectiveness of its IT investment?	16	<ul style="list-style-type: none"> <li>Lack of <b>transparency in cost</b> recovery model</li> <li>Lack of <b>communication</b> between stakeholders</li> <li>Lack of <b>citywide governance</b> for decision making and prioritization</li> <li>BTS is <b>lagging behind</b> in technology – <b>need to be digital</b></li> <li>CTO to take the lead, with Council</li> </ul>



BTS Strategic Goals	# Responses	Average Rating *	Key Themes
<b>Goal #1</b> Be Trusted Business Partners	22	3.7	<ul style="list-style-type: none"> <li>BTS is improving, better than before</li> <li>Inconsistency with BTS resource skill levels</li> <li>Lack of clarity on cost recovery model</li> </ul>
<b>Goal #2</b> Implement an Enterprise Technology Service Model	14	3.2	<ul style="list-style-type: none"> <li>Lack of partnership in decision making</li> <li>Lack of clarity with citywide enterprise mandate</li> <li>Lack of disaster recovery plan</li> <li>Need for more transparency on cost recovery</li> </ul>
<b>Goal #3</b> Provide Visionary Technology Leadership	15	2.7	<ul style="list-style-type: none"> <li>Lack of citywide vision for new technology</li> <li>Behind in technology innovation (not current)</li> <li>Operational issues</li> </ul>
<b>Goal #4</b> Promote a Culture of High Performance			BTS Internal goal

\*Rating Scale (1 through 5): 1) Poor, 2) Fair, 3) Avg./Meets Expectation , 4) Good, 5) Excellent

In a further assessment of the BTS management strategy, we found BTS to be

- Traditionally technology focused, emphasis on delivering operations
- Seen as responsive to customer needs but only at a tactical (operational) level
- Lacking strategic engagement, evidence from customer and staff engagement that BTS is looking to significantly strengthen planning and strategic engagement with bureaus
- Operating in a silo mentality among some members of BTS leadership

### E.1.2.2. BTS Organizational Structure

Sierra Systems has determined that BTS operates under a “Traditional Model” for IT organizational design (hybrid between centralized and federated). See Task II report referenced in Appendix A for leading practice definitions.

- All BTS IT resources report through to the CTO, however
  - Citywide IT resources not all within BTS (CTO control)
  - Some BTS resources dedicated to Bureaus, Bureaus specific resources, etc.
  - Lack of common and/or updated job classifications citywide
- Departments are in silos under the CTO and include typical functions
  - Aspects of typical IT functions fall under both the direction of Bureaus and the CTO, without clearly defined boundaries for accountability

As a result BTS faces many known challenges of the Traditional Model, such as:

- Narrow focus; silos between functional areas
- Inefficient communications; time consuming
- ‘Defensive’ strategy (specific operations); lack of teamwork, mistrust
- Duplication (e.g. strategy development, deployment models, security and release management)

- Lack of collaboration and transparency in prioritization; missed opportunities
- Lack of citywide strategy; need for clarity between operations and strategy (CIO – strategist, futurist, business / CTO – operational, technical)
  - It is noted that the lack of citywide strategy extends beyond IT and is considered a reflection of the overall commission form of government unique to the city

For the most part BTS has a healthy relationship with its customers; however this is primarily transactional in nature and does not encompass a comprehensive Customer Relationship

Management strategy:

- Good view / response regarding specific needs (order taker) not seen as trusted partner (forward thinking)
- Multiple silo Customer interface points (PMO, Help Desk, TBC, CSG, Director Visits)
- Limited strategic business engagement, no visible business architecture / collaboration regarding business outcomes
- Many regular meetings (e.g. Monthly CSG) no formal accountability to ensure objectives are communicated effectively (Measurable Communication Strategy); minutes are available
- BTS sometimes learns of projects from customers too late (in some cases post budget and procurement), with little to no opportunity to influence outcomes and approach

### E.1.2.3. BTS Service Delivery Model

In assessing the BTS Service Delivery Model<sup>1</sup>, Sierra Systems identified the following key findings:

- Lack of clearly defined set of Guiding Principles for technology service delivery across the city
- A cohesive and understandable Applications Portfolio Architecture does not exist – needs to be developed
- A mix of technology strategies are competing for limited resources (skills, standardization) – In-house built applications, commercial applications, various technologies and duplication of capabilities
- Features and functions of existing large scale core systems may not be fully utilized
- The number of new IT requests for development & support exceeds capacity to meet demand (unclear prioritization, coordination regarding new work)
- A lack of metrics to manage and monitor the effectiveness (quality & timeliness) and efficiency (cost) of applications
- Business Continuity / Disaster Recovery Risk – necessary redundancies are not currently built into network and data center infrastructure to ensure that it can operate at the required service levels

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<sup>1</sup> A Service Delivery Model refers to the technical skills, process rigor, tools, methodologies, overall structure and strategies for seamlessly delivering technology-enabled services.

- Current Bureau funding models do not cover high availability (24x7x365) for the majority of applications and infrastructure
- Unclear priorities – out of date assessment of technology portfolio and customer risk tolerance (majority of applications are indicated as critical)
- Hybrid embedded teams have created an unclear reporting model (decision structures), lack of clarity with respect to loyalty and priorities – clear defined governance and role definition are required
- Numerous duplicate application types, potential lost value through not maximising use of enterprise portfolio investments
- Lack of clarity regarding strategies / policies for emerging technology trends (mobile, SaaS, Cloud, analytics, Bring Your Own Device (BYOD))

#### E.1.2.4. BTS Business Processes

Sierra Systems undertook a detailed assessment of 28 key BTS Business Processes and Work Practices, in the following categories:

- IT Strategy Development
- IT Tactical Management
- Systems Application Delivery & Evolution
- IT Technology Stewardship
- IT Operations
- IT Customer Support

In summary it was found that BTS has a healthy operational relationship with customers, specifically with exceptionally good feedback on overall responsiveness with problem solving. In addition BTS is performing well at the operational level with consistent use of service delivery, procurement and vendor management, and security policies for individual projects or bureaus.

The key process gap is at the strategy development and tactical management level, specifically related to cross-bureau and enterprise-wide processes and work practices. Examples include (see Task II report referenced in Appendix A for the complete dashboard report card on each of the 28 processes):

- Existing **Technology Governance Committees** are insufficient to support Citywide technology prioritization and monitoring
- A citywide **Technology Vision and Master Plan** is a gap; cohesive **Bureau strategic/business plans are needed** to inform and support the Technology Vision and Master Plan
- No consolidated **citywide funding perspective**; budgets managed primarily at the Bureau level
- **Limited metrics** and key performance indicators (KPI's) in place; need for automated Performance Reporting and Information Management to support decision making



- Staff consumed with maintaining existing applications and services; little time for benchmarking or emerging technology
- Citywide technology-specific **risk management framework** not in place – align to citywide risk management processes
- **Technical Architecture is well defined** and largely consolidated, however **other key architectures require attention**:
  - Citywide **Application & Data Architecture** is fragmented
  - **Business Architecture** models do not exist independent of the applications that support business processes
  - **Information Architecture** models are incomplete
  - **Integration Architecture** models are not coordinated
- **Applications Portfolio extremely complex**; integration efforts to date primarily involve Infrastructure
- Inconsistencies exist across various **siloes in the delivery and deployment of systems application**; applications built in silos

### E.1.2.5. 2003 Ordinance Report Card

Sierra Systems assessed the progress made in technology consolidation in regards to expected benefits and outcomes stated in the 2003 consolidation ordinance as follows:



**Status Key** : R = process doesn't exit, O = ineffective, impacts to other processes  
Y = exists, incremental improvements, G = exists, defined processes, N = neutral

2003 Consolidation Outcome	Status	Notes
Maximize the cost effective use of technology...improving coordination and integration	Y	<ul style="list-style-type: none"> <li>• Significant savings have been realised since 2003 (e.g. elimination of 53 technology positions, consolidation of infrastructure and applications)</li> <li>• Opportunities do exist for further improvement (duplicate application e.g. asset management, document management and archiving, time tracking)</li> </ul>
Provide a more efficient, direct and unified approach to technology services ...integrate planning and implementation of IT and Telecommunications projects	Y	<ul style="list-style-type: none"> <li>• Enterprise-wide business applications exist (SAP, GIS), implementations have had mixed success</li> <li>• Lack of enterprise-wide roles and functions, including architecture, information management, financial management</li> </ul>
Provide opportunities for unified engineering (e.g. data network, infrastructure, security, connectivity)	G	<ul style="list-style-type: none"> <li>• Electronic Data Exchange and Office 365 in progress</li> <li>• Consolidation of telecommunications, call center and network/server backend standardization complete</li> <li>• Disparate data centers to be consolidated; multiple 1-800 numbers</li> </ul>
Provide leadership in strategic planning and management of IT with an emphasis on meeting business needs in a cost effective and timely manner	R	<ul style="list-style-type: none"> <li>• Lack of citywide IT strategy and governance framework</li> <li>• Lagging behind in emerging technologies and policies</li> <li>• Lack of understanding in cost recovery model and view of IT spending across the City</li> </ul>

### E.1.2.6. Span of Control

Sierra Systems has found that a series of Citywide span of control recommendations were developed for the City of Portland in 1994:

- Two follow up audits, in 1997 and 2011, report minimal progress in implementing the 1994 recommendations and that the City has not yet established organizational structure goals nor span of control targets
- The 2011 audit recommends the City establish and review span of control targets, as well as revisit and implement the long-standing recommendations from the 1994 study
- In Fall 2013, the Council Budget Subcommittee 1 provided direction that all management/supervisory jobs should have at least four direct reports and that any with 3 or less would need resolution
- The City is in the process of assessing its span of control, with the analysis and recommendations to be complete for the Spring 2014 Budget Monitoring Process

An assessment by Sierra Systems of the BTS January 2014 organizational chart shows the following:

- BTS has 28 managers
- 3 of the 28 managers has a span on control ratio of 1:3 or less
  - 1:2 Business Solutions, Planning and Development, Info Sys Mgr, Sr-Generalist
  - 1:2 Administration, Mgmt Analyst, Sr
  - 1:3 Information Security, Info Sys Mgr, Sr-Security

The proposed organizational structure of Plan, Build, Run supports the direction from the Council Subcommittee to streamline the span of control.

The proposed governance structure can be leveraged to prioritize specific technology initiatives Citywide and further refine span of control decisions.

### E.1.2.7. Conclusions

Given the above findings, the following conclusions can be made:

- **Consider revised organizational model** with greater focus on planning and business engagement
  - Applications built in silos resulting in **complex Application Portfolio** with minimal integration or use of core systems
  - **Lack of clarity with roles** where dedicated embedded application teams exist, results in duplication of services and greater compliance risk
- Repeated budget cuts have created an **operational/tactical culture**, most resources directed to support existing services with little time for architecture development, benchmarking
- Existence of service delivery **Guiding Principles** can result in a lower complexity application portfolio; impacts budgets and resources

- **Without a Citywide (enterprise) view** and governance, potential increases to overall technology costs and risk
- A citywide view of funding or information management and robust KPIs, will improve **ability to manage or monitor technology**
- Absence of a citywide **Technology Vision, Master Plan & Bureau business roadmap** lead to complexity and difficulty to prioritize
- **Business continuity** is a known significant risk, however resources to support implementation in a timely manner are insufficient
- Strategies and policies for **emerging technology trends are unclear**; the city falls further behind public demand
- Evidence of strong working relationship with Bureaus; a **solid foundation for improved engagement model**

### E.1.3. Recommendations

To address the above findings and conclusions, Sierra Systems recommends the following:

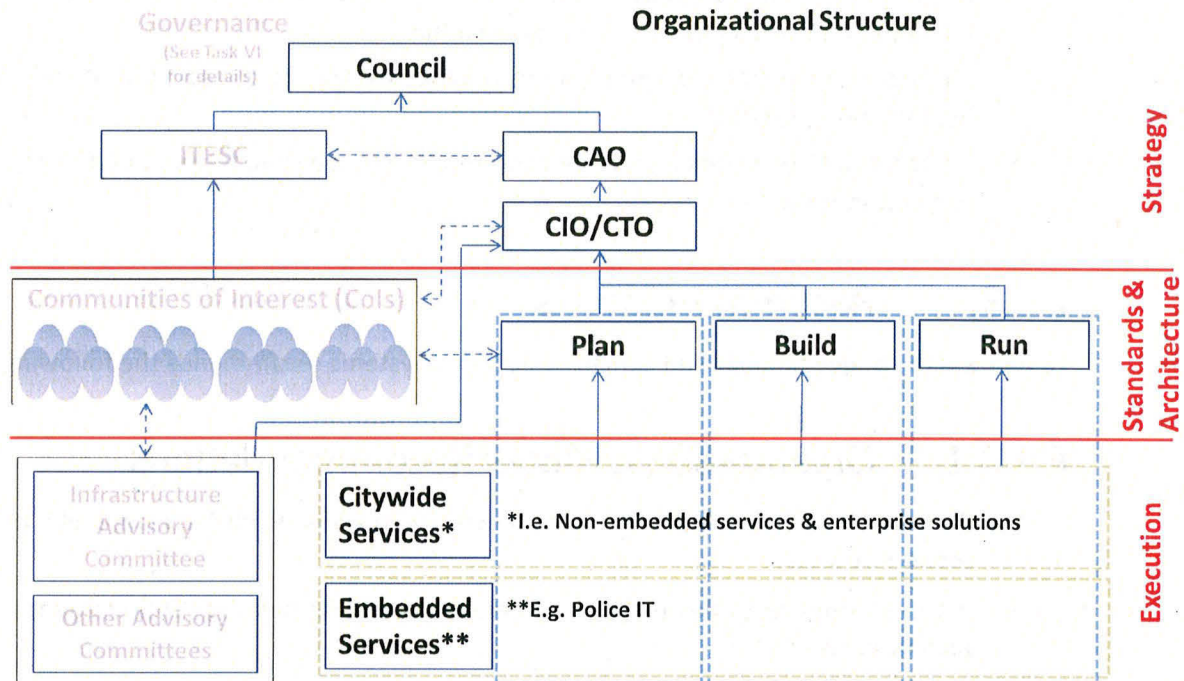
#### E.1.3.1. Organizational Model Recommendations

- R-TII-01: Consider implementation of a **new organizational model**: Plan, Build, Run (see section E1.3.1.1)
- R-TVI-53: **Augment role and responsibilities of the CTO** (see Task VI Governance recommendations)
- R-TII-02: Define clear role and responsibilities of the **enterprise architect**
- R-TII-03: Clearly define role and **responsibilities of BTS vs. Bureaus**
- R-TII-04: **Review terms of reference** for existing groups, e.g. CSG, to assess role with new organization structure and governance model
- R-TVI-51-54: Implement Task VI **Governance recommendations**
- R-TII-05: Create and implement a **comprehensive change management strategy** and plan to support organizational transformation at all levels; communicate with technology staff and Bureaus



### E.1.3.1.1. Plan, Build, Run Model

To address the silo nature of the current state and a focus on operations vs. strategy, the following diagram outlines the recommended organizational structure for BTS and the relationship to the recommended governance model (in grey) outlined in detail in section E.5. This structure leverages a leading practice identified by Forrester (Source: Forrester, *New Organizational Models Of IT Balance Efficiency With Responsiveness*, Feb 2013).



The proposed roles and responsibilities associated with this new structure are as follows:

	CIO/CTO	Plan	Build	Run
Roles	<ul style="list-style-type: none"> <li>Overall Tech. Strategy</li> <li>Business Relationship Management</li> <li>Compliance and Risk Management</li> <li>Technology Innovation</li> <li>Information Management</li> </ul>	<ul style="list-style-type: none"> <li>Enterprise Architecture</li> <li>Portfolio Management</li> <li>Financial Management</li> <li>Customer Relationship Management</li> <li>Vendor Management</li> </ul>	<ul style="list-style-type: none"> <li>Requirements Definition</li> <li>Development</li> <li>Acquisition</li> <li>Resource Management</li> <li>Solution Architecture</li> <li>Project Management</li> </ul>	<ul style="list-style-type: none"> <li>Service Management</li> <li>Application Maintenance</li> <li>Infrastructure Maintenance</li> <li>Customer Service</li> <li>Performance Management</li> </ul>
Responsibilities	<ul style="list-style-type: none"> <li>IT Vision &amp; Master Plan</li> <li>Citywide Technology Budget</li> <li>KPIs and Performance Reporting</li> <li>Business Continuity and Disaster Recovery</li> <li>Change Management Strategy and Execution</li> <li>Communities of Interest (Col)</li> <li>Outsourcing Strategy</li> </ul>	<ul style="list-style-type: none"> <li>Account Management</li> <li>Application Portfolio</li> <li>Infrastructure Portfolio</li> <li>Project Portfolio</li> <li>Integration Architecture</li> <li>Information Architecture</li> <li>Business Architecture</li> <li>Application and Data Architecture</li> <li>Vendor Management Office (VMO)</li> </ul>	<ul style="list-style-type: none"> <li>Project Management Office (PMO)</li> <li>Procurement Management</li> <li>System Development Life Cycle (SDLC) Standards and Methodologies</li> <li>Implementation Training and Change Management</li> </ul>	<ul style="list-style-type: none"> <li>Service Delivery Guiding Principles</li> <li>Service Desk</li> <li>Service Level Agreements</li> <li>Application and Infrastructure Operations</li> </ul>



The following RACI chart (a RACI chart defines who will be ultimately accountable vs. responsible for a function and who will provide input vs. only receive communications on decisions) provides additional detail of level of involvement for each role by core function:

Roles/ Functions	R = Responsible A = Accountable C = Communicate I = Input	BTS				COI	ITESC
		CIO/CTO	Plan	Build	Run		
IM/IT and Business Strategy		R	I	C	C	I	A
Customer Relationship Management		A	R	C	C	I	I
Technology Innovation		A	R	I	I	I	I
Compliance and Risk Management		A	R	I	I	I	C
Information Management		A	R	I	C	I	C
Enterprise Architecture		I	A/R	I	I	I	C
Portfolio Management		I	A/R	I	I	I	C
Financial Management		I	A/R	I	I	I	C
Relationship Management		I	A/R	I	I	I	C
Vendor Management		I	A/R	I	I	I	C
Development		C	I	A/R	I	C	C
Acquisition		C	I	A/R	I	C	C
Resource Management		C	I	A/R	I	I	C
Solution Architecture		C	I	A/R	I	I	C
Project Management		C	I	A/R	I	I	C
Service Management		C	I	I	A/R	I	C
Application Maintenance		C	I	I	A/R	I	C
Infrastructure Maintenance		C	I	I	A/R	I	C
Customer Service		C	I	I	A/R	I	C
Performance Management		C	I	I	A/R	C	C

### E.1.3.2. Service Delivery Model Recommendations

Sierra Systems has identified the following service delivery model recommendations:

- R-TII-06: Work closely with Bureaus to create citywide service delivery **Guiding Principles**
- R-TII-07: Focus on execution of **operational efficiencies** (see Tasks IV and V recommendations) to allow for time required for architecture, benchmarking and emerging technologies; consider a Core Services Review process
- R-TII-08: Prioritize **business continuity** and disaster recovery; identify team with clearly defined roles and responsibilities
- R-TVI-52: Create **Col for emerging technologies** (see Task IV recommendations)
- R-TII-09: Consider and review **options for outsourcing** to support the new organization structure

### E.1.3.3. Business Process Recommendations

Sierra Systems has identified the following business process recommendations:

- R-TII-10: Work closely with Bureaus to build a citywide technology **Vision and Master Plan** and Bureau business strategy and plan; develop multi-year **aligned technology and business roadmap** to allow for needed prioritization and simplification of support
- R-TII-11: Develop **KPIs with performance reporting** processes and supporting information management capabilities to enable performance monitoring against the roadmap
- R-TV-34: Create **citywide view of financial reporting** (see Task V recommendations) to establish benchmark for technology spend
- R-TII-12: Create initiative to **complete citywide architectures**, aligned with newly defined role of enterprise architect
- R-TII-13: Create **Customer Relationship Management Strategy** under CTO
- R-TII-14: Create Citywide technology-specific **risk management framework**

## E.2. Citywide Technology Related Staff Skills & Proficiency (Task III)

### E.2.1. Overview

The Citywide Technology Related Staff Skills and Proficiency includes an assessment, findings and recommendations regarding BTS staff skills and competencies as they relate to meeting current and emerging customer needs. Specifically:

- Develop and administer an on-line survey to gather information on current job skills and competencies to determine if current job skills meet the needs of the City and conduct a GAP Analysis between what skills exist and what skills are required for optimal job performance.
- Determine what skills are required to provide optimal job performance. Determine what skills employees indicate are required to provide optimal job performance. Develop GAP Analysis for difference between employee required skills and employee desired skills. (part of online survey above)
- Review technology specific job classifications and determine if they provide sufficient skills and competencies to meet the needs of the bureau.
- Determine what would be best course of action to ensure that BTS staff receives needed training to effectively maintain current technology systems and implement newly requested technologies.

### E.2.2. Current State Findings

#### E.2.2.1. Review of Citywide Training & Development Mechanisms

Training and development mechanisms across the City include:

1. Collective Agreement Provisions
  - COPPEA Article 23: Professional Development (\$150K fund available for all citywide COPPEA staff as of 2014/15)
  - DCTU Article 32: Training, School and Conventions (allows DCTU staff to attend training and City will reimburse)
2. BTS Performance Development Plan (kick-off in 2013/14)
3. BHR Mandatory and Recommended Training List (<http://www.portlandoregon.gov/bhr/article/427892>)
4. Portland Community College (PCC) CLIMB Center Course Catalog (Classroom-based training)
5. External training contracts (e.g. Global Knowledge, Kinetic)
6. Project-specific training (built into project budgets)

7. Bureau-specific training funds
8. ACM Training (subscription \$90/year per person)

### E.2.2.2. BTS and Bureau Interviews

The following comments regarding training and development were collected from interviews with Bureau directors and their delegates:

- Bureau satisfaction with the Technology Business Consultant (TBC) role is highly dependent on the skill level of individual TBCs
- Perception by managers that a wide range of level of skill and competency exists across technology staff of equal job class
- Perception by managers that staff in vertical or embedded models tend to be better trained due to focus on a specific specialty
- Smaller bureaus lack the internal training resources that larger bureaus have access to due to their size
- Technology is changing rapidly, Bureaus all have different needs
- BTS needs to better understand the Bureau's business
- Job classification profiles are outdated; lack of consistency between technology job classifications citywide

## E.2.3. Citywide Skills and Competencies Online Survey

### E.2.3.1. Overview

The following is a high level overview of the online survey. For more detail see the Online Citywide Survey Design document referenced in Appendix A.

#### E.2.3.1.1. Survey Purpose and Objectives

The following are the purpose and objectives of the online survey:

- Gather information on current technology jobs skills and proficiencies
- Determine skills employees say are required to function at optimal level
- Assess citywide technology related job classifications and current performance
- Use the survey results to determine the best course of action to develop staff to an optimal level of performance to meet customer needs

#### E.2.3.1.2. Critical Success Factors

The following are the critical success factors of the online survey:

- ✓ Leverage survey design best practices
- ✓ Engage staff and key stakeholders in process

- ✓ BTS and Bureaus engaged and understanding the role of technology related staff skills assessment
- ✓ Collaboration with Bureau of Human Resources and Labor Relations

### E.2.3.1.3. Online Survey Considerations

The following considerations have been made regarding the construction of the survey:

- The survey is intended to assess the skill sets and proficiency levels of staff in current citywide technology related positions as well as to identify the training, development and other needs of staff to perform their jobs at a level that consistently meets division and bureau objectives or customer needs (optimal performance).
- The survey focuses on current state performance. Although, a few questions in the survey assess skills and needs, for immediate/near future needs, the focus is current rather than long range.
- Recommendations will take into consideration past and current training and development activities and alternative recommendations to the City of Portland based on the outcomes of survey responses.
- Job classifications for citywide technology related staff may in some cases be out of date. As the effort to remedy this gap is outside of the scope of this project, the alternative is to request in the survey that respondents respond only to appropriate skill sets for their technology related roles, and to add additional skill sets not identified in the list of skill sets for their job classification.
- For job classifications at a higher level, where there is assumed to be included skill sets at a lower level (e.g. Information System Technical Analyst VI, has specific skill sets for this level in addition to technical knowledge training of level I-V) the survey questions for the Analyst VI will include only those specific to this job classification level.
- There are some technology related staff in managerial or other roles where technology related skills may be a component of their job role, yet not be reflected in their job title or complete range of skill sets. An option to add a job classification/working job title and specific technology related skill sets has been added to the survey design to ensure these staff are included in the survey.

### E.2.3.1.4. Online Survey Scope

The scope of the online survey included:

- ➡ 377 participants
- ➡ 75 job classes
- ➡ Citywide – BTS and Bureaus



### E.2.3.1.5. Our Approach

It is difficult to predict the level of survey participation; survey response rates depend on a variety of factors. Leveraging a best practices approach increases the likelihood of a high survey response rate.

Best Practice	Our Approach
Surveys under 10 minutes will receive highest responses	➔ Likert scale ratings were used to ease selection of responses and speed
Send Reminders, and limit yourself to no more than two reminder emails	➔ Sent 1 half-way reminder, and a final reminder on the last day
Launch business surveys early in the day, and collect a minimum of two weeks	➔ Survey was launched Wednesday morning, for 2 weeks
Utilize advanced tracking when responses are of high value	➔ We used survey logic to track responses

### E.2.3.1.6. Our Result

The City of Portland followed survey best practices and received an exceptional **71%** end response rate!

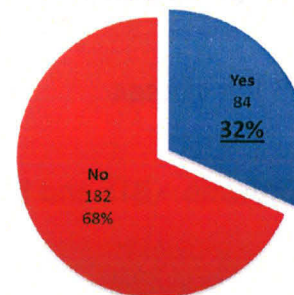
Predictable Result	Our Result
Half of all surveys receive at least a 26% response rate	➔ We had a 25% response rate at end of day one
Half of survey responses arrive within one day, predicting the final result	➔ This would equate to a 50% end response rate; we were at 53% after 1 week
Internal surveys generally receive a <u>30-40%</u> response rate on average, compared to an average 10-15% response rate for external surveys	➔ The City of Portland received an exceptional <b>71%</b> end response rate, with over 75% of the optional open-ended comments also filled out

### E.2.3.1.7. Online Survey Design

#### Self Reported Anonymous Survey

- ▶ Demographics
- ▶ Manager and Supervisor Specific Questions
- ▶ Past Training and Development
- ▶ Proficiencies Level (current and optimal) by Job Class
  - Technical
  - Non-Technical

Although the Survey was Anonymous, 32% Provided Their Name



The results will be compiled and viewed as a whole – there is no intent for analysis into specific job classifications, or to an individual level.

Q35 Edit Question ▼ Move Copy Delete

**35. Application Analyst I: Generalist - Non-Technical Skill Set**

	Current Proficiency Level	What level would be required to consistently meet division and bureau objectives, or customer needs?
Ability to create and generate various reports, charts and other materials.	<input type="text"/>	<input type="text"/>
Ability to respond to and identify user needs and determine resolutions.	<input type="text"/>	<input type="text"/>
Ability to evaluate, test, implement and support new system applications.	<input type="text"/>	<input type="text"/>
Ability to analyze and assess the technological needs of City departments.	<input type="text"/>	<input type="text"/>

### E.2.3.2. Citywide Skills and Competencies Online Survey Results

The following is a summary of the key results from the online survey. For additional information see Task III final report referenced in Appendix A.

- 377 BTS and Bureau technology staff across 75 Job Classifications were surveyed
- Survey responses are represented equally by BTS and Bureaus: 15% of respondents were managers, representing 10 Bureaus and 6 Divisions of BTS
- Of those who responded, 40% of staff have been with the City for 13 years or more and 15% have been with the City for less than 3 years
- One quarter of all technology staff in the City changed Job Classes within the past 3 years and Only 56% of these staff have received training in the past year





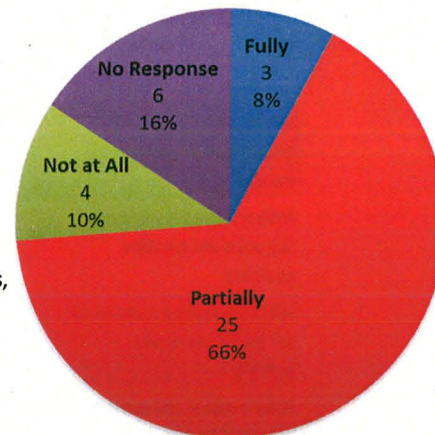
#### Reasons for Training Needs Partially or Not at All met:

- Training is too costly
- Due to workloads of staff it is challenging to make the time for training

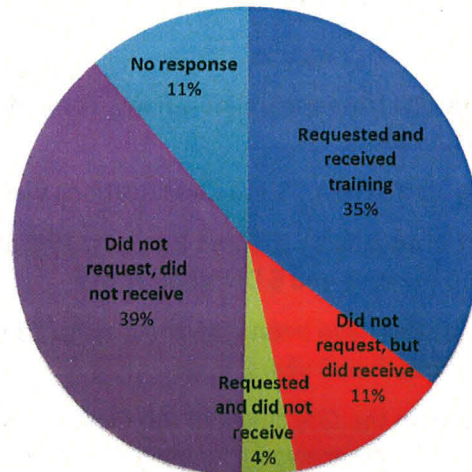
#### Impacts of Training Needs Partially or Not at All met:

- Takes us longer to develop applications in newer technologies, loss of productivity
- Slow adoption of key emerging technologies, inability to meet business needs
- Missed opportunities due to lack of knowledge/resources
- Stress is added to the employee if they aren't properly trained

#### Priority Training Needs Met



#### Staff Requested and Received Training



The majority of respondents who requested training within the last year (39%) did receive training.

Staff who requested training but did not receive training (4%), commented on the lack of time and funds for training and development

Staff reported on a wide-range of training and development opportunities when responding to the survey. The following are examples of the types of non-classroom style training reported as requested and/or received by Staff.

#### Attending conferences

- IT Management Conference
- Software Admin User Conference
- VMworld Conference
- Utility Joint Use conference
- GIS in Action Conference

#### Other

- Vendor provided
- Vendor post-purchase demos

#### Personal Development\*

- Regularly attending user groups related to SQL Server Database Administration
- I have been learning on my own time to keep up my skills
- Regularly attend the Portland Drupal user group
- Self-study Java and C++
- Lots of reading, research and hands-on training to address technology needs

#### Online or web-based

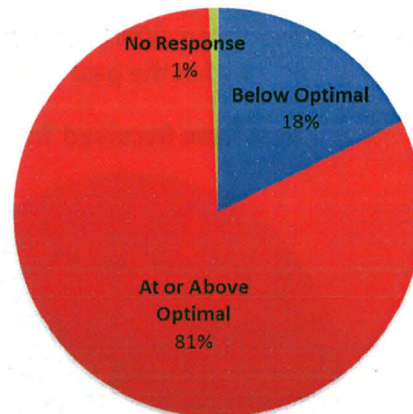
- Web-based training for Office 365/2013 (via Lynda.com)
- Some online IT University
- Online training for .Net development



The majority of respondents (81%) rated their current skill level at or above the optimal skill level for the specific skill proficiencies in their Job Class

**Overall Skill Level**

**Optimal** = level required to consistently meet division and bureau objectives, or customer needs



Of all proficiencies rated by survey participants the following proficiencies were rated lower:

Type	Description
Non-Technical	<ul style="list-style-type: none"> <li>• Communication</li> <li>• Leading and Collaborating with teams, Project Management</li> <li>• Facilitating</li> <li>• Training</li> </ul>
Technical	<ul style="list-style-type: none"> <li>• Business Analysis and Technical Documentation</li> <li>• Database Management</li> <li>• Troubleshooting</li> <li>• Quality Assurance (QA) and Systems testing</li> <li>• Information Systems (IS) Management</li> <li>• Software Design and Installation</li> </ul>

Respondents who rated at least one of their current skills as lower than optimal were more likely to work in one of the following Job Classes (the classification series listed below is by far the largest pool surveyed):

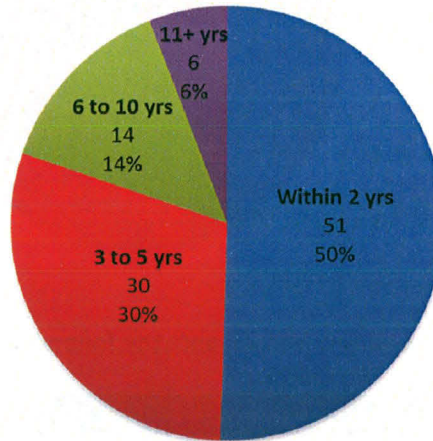
- Application Analysts
- Information Systems Technical Analyst (ISTA)
- Principal Information Systems Analysts
- SAP System Analysts
- Business Systems Analyst

### E.2.3.3. Training and Develop Gaps Analysis

Assessment of the survey results shows the following training and development gaps.

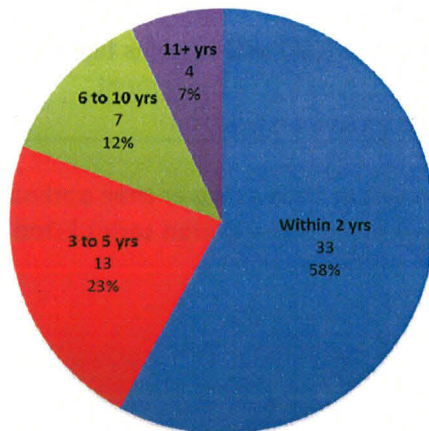
Of those who responded, 50% of staff have not been trained within the past 2 years

**Last Time Received Training**

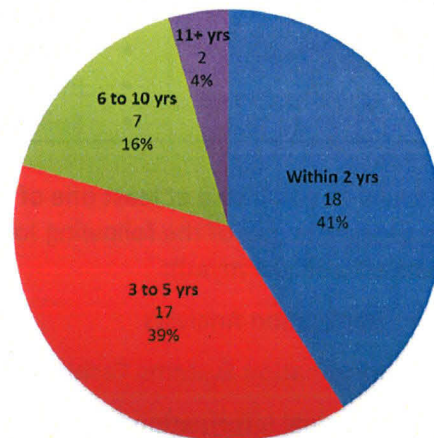


Of those who responded, 58% of BTS staff have been trained within the past 2 years compared to 41% at Bureaus

**Last Time Received Training: BTS**

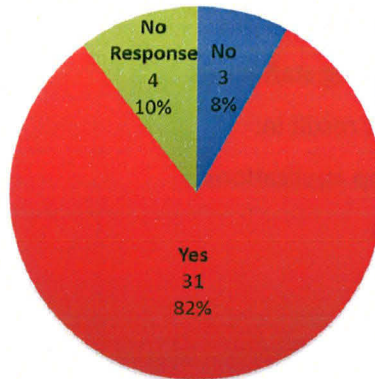


**Last Time Received Training: Bureau**

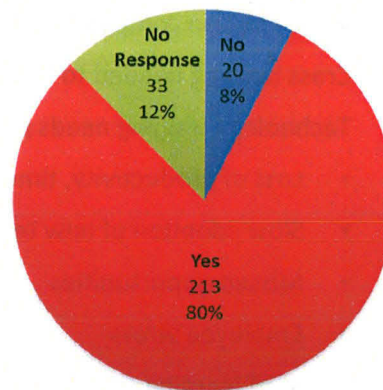


Over 80% of managers and staff have  
a need or desire for training

**Do Managers Anticipate  
Training Needs Within 1 Year?**



**Do Staff Want to  
Broaden Their Skills?**



The following are examples of the types of training needs identified by  
Managers and Staff

**Manager Training Needs  
Partially or Not Met**

- Office 365/Windows 7 (4 requests)
- Project Management (3 requests)
- SQL related (3 requests)
- ArcGIS 10.2 (3 requests)

**Training Requested  
by Staff**

- Project Management (11 requests)
- SAP related (8 requests)
- Office 365/Windows 7 (7 requests)
- GIS related (7 requests)
- SQL (5 requests)
- Avaya related (3 requests)

The following are examples of training needs anticipated for the future:

- Citywide software deployments or refreshes (e.g. Office 365, new enterprise-wide solutions)
- Major software upgrades for existing systems
- Any new project that deploys new tools
- Transition of support responsibility from one group to another
- Emerging technologies under serious consideration (e.g. SaaS and Cloud, payment gateway, mobile)
- Fields of expertise emerging within the City (e.g. disaster recovery)
- Business expertise required to support Bureaus in the new Community of Interest (COI) model
- Increased cross-training to more effectively leverage shrinking resources, including cross-bureau cross-training
- Predictable rates of staff turnover or movement – in the next few years, 31% of Citywide staff are expected to be retiring from their positions

## E.2.4. Conclusions

Given the above findings, the following conclusions can be made:

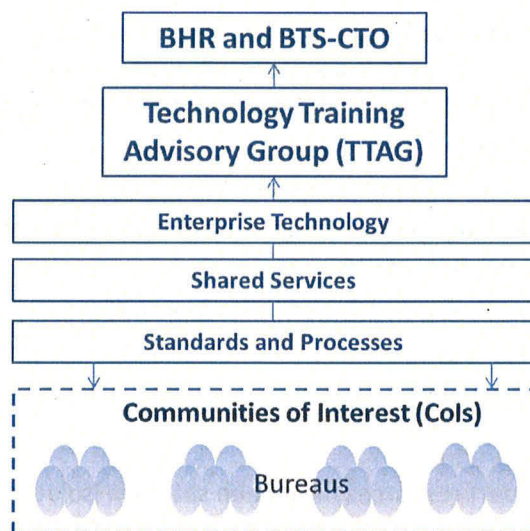
- Skill sets lag behind as new technologies emerge
- Wide range in competency in staff of equal job class
- Cross training needed to leverage shrinking staff levels
- Technology training needs partially met result in:
  - Loss of productivity, time to develop applications
  - Slow adoption of new technologies
  - Missed opportunities
  - Employee stress
  - Staff learning reactively
- 81% of staff report at or above their optimal level in competencies for job class
- Less than optimal performance levels where training is required include:
  - In non-technical areas: communication, leading and collaborating with teams, facilitating, training
  - In technical areas: business analysis/technical documentation, database management, troubleshooting, QA/systems testing, IS management, software design/installation
- Respondents who requested also received training
- 50% of staff did not receive training in the last 2 years
  - 82% of managers anticipate a need for training
  - 80% of staff have an interest in broadening skills
- Managers support the need for training citing:
  - Insufficient staff and training in new technologies
  - Lack of specific skill sets to support existing applications



## E.2.5. Recommendations

Sierra Systems has defined 4 key recommendations to address the skills and competencies current state assessment findings and conclusions.

- **R-TIII-15: Create Citywide Technology Training Advisory Group** in a federated model providing for BTS and Bureau management



Aligned with leading practice and the Task VI Citywide Governance recommendations, similar to the Infrastructure Advisory Group.

This model is also in alignment with the City's vision for the SAP Learning Management System. Phase 2 is scheduled for 2014.

Additional resources may be required (BTS/BHR) to support the suggested model.

### Technology Training Advisory Group Mandate:

- Advises and supports BTS CTO and BHR on the direction and development of corporate IM/IT training and development strategies
- Develops performance measures and reporting processes for corporate IM/IT training
  - For review and endorsement by the Cols and, in turn, the IT Executive Steering Committee (ITESC)
- Develops enterprise training programs, sets standards, and manages enterprise learning systems
- Coordinates identification of training needs, identifies experts and facilitates training needs assessment (TBCs, bureau liaisons, etc.)

### Reports to: BHR and BTS-CTO

### Membership:

- An open forum involving interested business and IT managers in BTS and bureaus
- BTS TBCs
- BHR

### Chair: BHR

### Secretariat: BTS

### Bureaus (Business Units):

- Responsible for local learning strategy alignment / development as well as learning delivery for BU specific functional learning

- **R-TIII-16: Identify strategic and priority training needs** for organizations, projects and key resources to achieve citywide objectives.
  - **Align Citywide training needs** to achieve business goals and objectives and set training priorities.
  - **Complete a training needs assessment** to identify priority training needs. Work with BHR to ensure approach is consistent with other job/skills areas.
  - **Review job classifications and competency models** to ensure the skill sets identified fulfill the performance requirements and support recruitment, training and development, and retention of skilled staff. This may require a fairly large effort from BHR's classification/compensation division.
  - **Review available BTS and Bureau training programs and opportunities**, undertake curriculum planning to fill gaps, augment offerings, and structure their application across citywide organizations as appropriate.
  - **Use a project management approach** to ensure timely and responsive planning of priority training and development programs.
- **R-TIII-17: Mobilize expert resources as mentors**, cross-training and cross-bureau, to augment training and development.
  - Mentoring programs using expert resources have been set up in isolated divisions to ensure technology-related staff are fully trained. It is recommended that these expert resources be shared within a bureau cluster to provide cross-training and support.
  - It is further recommended that priority attention be given for additional training to Business Systems Analysts and possibly Technology Business Consultants:
    - Analysts who provide support to Bureaus and cross-Bureau to meet the needs of citywide groups
    - Analysts who face more of the unknown and emerging technology
- **R-TIII-18: Evaluate training outcomes, KPIs, gaps**, to ensure consistent quality performance citywide.
  - A Performance Development Plan is being implemented with managers at BTS in the 2013/14 fiscal year. It is recommended to implement a standardized performance program citywide, beyond BTS
    - Implementation of a citywide program would mean a shift in responsibility for the Performance Development Plans to BHR
  - It is recommended that further review by the Technology Training Advisory Group be conducted to assess training needs and to:
    - Identify Key Performance Indicators (KPIs)
    - Provide annual measures of staff performance
    - Assess level of satisfaction of managers with staff capabilities to meet business needs

## E.3. Citywide State of Technology (Task IV)

### E.3.1. Overview

The Citywide State of Technology includes an assessment, findings and recommendations regarding the state of technology usage Citywide. Specifically:

- Examine the state of technology Citywide as well as current plans (5-year CIP, existing Operating Projects as well as other projects in process such as the PSSRP, BDS ITAP Project, existing EBS division work plan, etc.)
- Review existing Citywide inventories of bureau business systems/applications including but not limited to work order management, inventory control, asset management and revenue collection.
- Assess business system/application lifecycles for the City's current application portfolio to identify future opportunities to leverage the City's investment in SAP as a potential replacement platform.
- Review 5-year technology strategy, roadmap and develop a supporting budgetary estimate.
- Assess the readiness of the City to leverage technology platforms for SAAS, CLOUD and Mobility.
- Assess the effectiveness of citywide coordination efforts to provide visibility and transparency into technology decision making.
- Assess the progress made to establish and adhere to citywide technology standards and roadmaps.
- Provide recommendation for how the City can leverage its technology investments to meet enterprise needs.

### E.3.2. Current State Findings

Sierra Systems has identified the following current state findings:

#### E.3.2.1. Current and Planned Application Inventory

The scope of the application inventory assessment included:

- Review existing BTS and Bureau inventories
- Identify opportunities for application rationalization and consolidation, including but not limited to:
  - Work order management
  - Inventory control
  - Asset management
  - Revenue collection

- Examine how the City can leverage its existing technology investments to meet future enterprise needs

The key findings in the application inventory assessment include:

- A number of catalogs exist however they are not considered comprehensive
- Available catalogs indicate the City has between 550 - 650 applications with a continuous demand for additional business capabilities requested weekly
- Approved applications includes a mix of custom applications, enterprise services, desktop services and web based "Off-the-shelf" products
- Demand for review and approval of new and upgraded applications currently far exceeds the capacity of resources available to review in a responsible way - formalize review and approval process via PMO
- Sufficient resources and processes are needed to consolidate a Citywide application inventory and ensure those responsible for planning can reference the material with confidence.
- For this assessment, Bureaus were tasked with identifying their key applications. This inventory can be used as a starting point to refresh the Citywide list of priority applications.
- A consolidated inventory will be required by the proposed Communities of Interest as they embark on technology prioritization and recommendations.
- As demand increases and the number of applications grow, the importance of Citywide technology governance, streamlined processes, and standardization increases.

### E.3.2.2. Application Rationalization/Consolidation

Sierra Systems has identified several efforts currently underway to improve overall application consolidation. Examples of these efforts include:

- Long running Citywide program for GIS solutions
- SAP/ESB consolidation
- The Public Safety System Renewal Program (PSSRP) – various major public safety system renewal initiatives under the program
- Online payment consolidation via a payment gateway
- Consolidation of web based applications on Portland Online and TrackIT which serves as a platform for over 150 web based data entry applications Citywide

Several additional rationalization and/or consolidation opportunities have been identified through interviews and workshops for consideration:

- **Digital Engagement – Website / Mobile Applications.** Linked to the above contact management requirement is an increased need to consolidate disparate efforts underway regarding digital citizen access - includes website and mobility capabilities (service bundling, log-on, payment, etc.).



- **Information Management – Shared Contact Management.** Numerous Bureaus have a need to maintain common contact management information for City partners and citizens - duplicate efforts are underway and legacy solutions in place  
  
Planned phase 2 and 3 rollouts under current Office 365 initiative (SharePoint, Lync). Additional features are available under the consolidated program provided through the Microsoft agreement.
- **Asset / Work Order Management Systems.** Multiple asset management / work order / billing systems are in place across the city bureaus. Significant investment has been made in this area however there are future opportunities and overall savings available through platform and license / contract standardization.
- **Greater leveraging of SAP solution.** Leverage SAP functionality, not just for asset management.
- **Permitting.** The City (BDS with Transportation, Fire, BES, Water, Planning and Sustainability, Parks, and smaller groups such as ONI) is currently replacing an enterprise capable system (replacing TRACS with the Infor Public Sector system) to improve permitting, plan review, site development, enforcement - code compliance, and neighborhood inspections. Other bureaus have similar needs and have indicated a desire to monitor this initiative in the interest of leveraging aspects of the solution for their future needs - frustration exists through a lack of champion, no mandate for BTS to drive as business solution

### E.3.2.3. Technology Decision Making

Key findings for technology decision making include:

- Success of an Enterprise program demands a Champion driving the initiative, with a governance model that allows for shared investment and expansion as the program develops
- Understanding of costs is essential: license, support, configuration, conversion, infrastructure, training, etc.
- Prioritization and decision making frameworks are prerequisites
- Responsiveness and capable dedicated support teams are essential to overall business satisfaction
- Flexibility and agility in the prioritization and work assignment process is needed to ensure individual program priorities can be addressed if essential to business continuity

### E.3.2.4. Leveraging the City's Investment in SAP

In reviewing options to leverage the City's investment in SAP, Sierra Systems has identified the following:

- Information provided to Sierra Systems during the assessment has indicated a **potential license saving in excess of \$500,000 per year**
- Cost savings result from removal of duplicate functionality potentially available through the existing SAP infrastructure (including software, hardware and support).

- However savings associated with license reductions would need to be **offset against increased technology investment** costs
  - Costs are associated with migration of current solutions including data conversion, training, interface development, customization, licenses, etc.
  - These technology costs are an investment that will often pay dividends in the future
- There is sufficient evidence to **recommend a comprehensive application rationalization** and consolidation program targeting Asset Management, Work Order and Billing Systems
  - Scope should include a **review of existing and future requirements and business case** development surrounding the city's asset management
  - See section E.3.3 below for more detail.

### E.3.2.5. BTS 5 Year Technology Strategy

Sierra Systems has found the following regarding the BTS 5 year technology strategy:

- Good progress has been made regarding operational strategy and roadmap for technology deployment and management
- In 2012 an Enterprise Architecture program was initiated however this is not a dedicated program (insufficiently resourced) and lacks sufficient authority to drive a consolidated citywide 5 year technology strategy
- Citywide Technology Governance and a consolidated Business Architecture (Needs, Priorities, Capabilities) are critical success factors required to ensure BTS' 5 year Technology Strategy provides useful outcomes for the city and meets critical business priorities (See Task II and VI Recommendations)

### E.3.2.6. Mobile and Cloud Computing “As-a-Service” Models

Regarding mobile and cloud computing, Sierra Systems has found:

- Various mobile initiatives are currently underway (BTS and Bureau specific), addressing:
  - Mobile application architecture
  - User Experience,
  - Mobile device needs,
  - Internal & external user requirements,
  - Policy (data retention, distribution, integration / sharing)
  - Cost recovery, purchasing implications
  - Overall support capability
- However there lacks a consolidated, dedicated mobile program
  - Current programs are not considered responsive enough to meet rising Bureau and citizen demand for mobile applications
  - No dedicated funding source targeting a consolidated mobile strategy for the city

- As a result there is significant risk that bureaus and application vendors will introduce conflicting and redundant technology solutions creating a need for future investment in consolidation
- This is could be considered a major technology risk area
- A strategy involving both cloud computing and “As-a-Service” technologies is evolving but would not be considered comprehensive
- Initiatives currently underway offer potential future savings and enhanced operational stability and capabilities

### E.3.2.7. Business Continuity

Sierra Systems has found a significant area of technology risk and expectation management related to business continuity and disaster recovery exists Citywide.

- Individual programs and operational areas have made commendable efforts to provide failover and redundancies to mitigate existing risk.
- Currently there is no enterprise Governance process or dedicated program (resources or funding) in place to ensure Business Continuity.
- Currently there is no comprehensive Disaster Recovery / Business Continuity plan in place for the City.
- It is not possible to assess the overall readiness of the City to continue critical operations and bring back technology services in the event of a major outage.

### E.3.2.8. Supporting Budgetary Estimate for 5 Year Plan

Sierra Systems can provide the following budgetary estimates and supporting processes and efficiencies for the 5 year plan:

- Move towards a standardized accounting model that provides an ability to provide a consolidated IT spend based on % of revenue generated citywide
- Executive Dashboard Capacity for Directors and Sponsors
- Target approx. 5-5.5% total IT spend (4% on Maintenance, Ongoing Operations, Systems and Equipment - MOOSE)
- Prioritize up to 7% of current IT spend on ongoing dedicated business continuity capability – have projects be self funding, consider outsourcing options
- Prioritize up to 6% of current IT spend on ongoing emerging technologies (R&D) include policy development, training, skills and capacity development
- Prioritize up to 8% of current IT spend on ongoing IT security capabilities
- Ensure Business transparency, contribution in technology prioritization process – regular feedback and reporting via Community of Interest
- Consider allowing Bureau stakeholders opportunity to select reduced service levels to offset costs associated with Business Continuity and R&D (All Bureaus need to agree)
- Prioritize efforts and plan to migrate remaining applications off Mainframe infrastructure – Auditor (LIEN Accounting)

### E.3.3. Recommendations

To address the above findings, Sierra Systems recommends the following:

- R-TIV-19: It is recommended that a **continuous program** be put in place under the governance of the proposed Community of Interest model to continuously monitor and assess business cases supporting further **application consolidation** (e.g. create a Citywide **Contact Management** Community of Interest Task Force)
  - R-TIV-20: Provide a technology **project report card** showcasing existing in progress projects with potential enterprise capabilities
- R-TIV-21: There is sufficient evidence to **recommend a comprehensive application rationalization** and consolidation program targeting Asset Management, Work Order and Billing Systems
  - Establish **Asset, Work Order, Billing** Community of Interest – assess BTS systems
  - The program could be initiated under the guidance of the Enterprise Architecture program reporting to a dedicated Community of Interest (Col) task force
    - The aim of the Col task force would be to develop a comprehensive 5 year roadmap for further application consolidation
  - BTS and EBS should pilot this initiative with a detailed review for Maximus, StellarRAD and SAP applications currently in use by BTS Communications
  - Scope should include a review of existing and future requirements and business case development surrounding the city's asset management
    - Include a comprehensive Return on Investment calculation (support, training, conversion, etc.)
  - BES, PBOT, and Water should be contributing participants in the business case development due to some similar system needs and applications in various stages of maintenance and support lifecycles.
- R-TIV-22: It is recommended that a **Mobile** Community of Interest (COI) Task Force be initiated to address the disparate mobile needs of the city
  - The COI task force should address the various mobile requirements and develop a business case and supporting technology roadmap to address the complete range of needs identified across the city
- R-TIV-23: Due to the rapidly evolving “**cloud/ as-a-service**” environment, it is recommended that the City consider implementing a pilot program combining subject matter area experts across the various business service disciplines
  - Requirements of the pilot program include:
    - A mandate to develop a comprehensive business strategy for providing services in a cloud / as-a-service technology paradigm
    - Agile in nature, with short task oriented deliverables aimed at evolving the city's comprehensive strategy in this area, flexibility to expand and contract as required
    - Provide autonomy to take risk and make mistakes



- The current initiatives should be considered pilot in nature
  - Initiatives need to be supported with dedicated resources across the full spectrum of city resources - technical specialists need to be complimented with a full range of business specialists, including Bureau technology and business specialists, procurement , legal, risk management, policy experts, and specific technologists
  - Initiatives should be provided with the authority and autonomy to respond to emerging trends, opportunities and challenges in this evolving landscape
- R-TII-08: Implement a dedicated citywide **Business Continuity Assessment Program** sponsored by Senior City Officials.
  - Forrester Research indicates a majority of enterprise businesses invest approximately 7% of total IT spending annually on business continuity. (Source: *2013 IT Budget Planning Guide For CIOs, Forrester Research Inc.*)
  - Requirements of the program include combining subject matter area experts across the various bureaus, tasked with:
  - Providing a comprehensive inventory / assessment of critical technology services
  - A roadmap / recommendations to address critical and high priority areas of infrastructure, program and capability risk.
- R-TIV-24: Move towards a standardized accounting model that provides an ability to provide a consolidated IT spend based on % of revenue generated citywide
  - R-TIV-25: Ensure Business transparency, contribution in technology prioritization process – regular feedback and reporting via Community of Interest
  - R-TIV-26: Target approx. 5-5.5% total IT spend (4% on Maintenance, Ongoing Operations, Systems and Equipment - MOOSE)
  - R-TIV-27: Prioritize up to 7% of current IT spend on ongoing dedicated business continuity capability – have projects be self-funding, consider outsourcing options
  - R-TIV-28: Prioritize up to 6% of current IT spend on ongoing emerging technologies (R&D) include policy development, training, skills and capacity development
  - R-TIV-29: Prioritize up to 8% of current IT spend on ongoing IT security capabilities
  - R-TIV-30: Consider allowing Bureau stakeholders opportunity to select reduced service levels to offset costs associated with Business Continuity and R&D (All Bureaus need to agree)
- R-TII-12: **Create a dedicated Enterprise Architecture Program** – Planning / Strategy
  - Comprehensive Business Architecture (capabilities, information needs, processes)
  - Application Inventory
  - Create consolidated view of Citywide IT expenditure

- Execute on **operational efficiencies**:
  - R-TIV-31: Consider fast tracking phase 2 & 3 Office 365 initiative for smaller Bureaus in need of greater application and case management capabilities
  - R-TIV-32: Prioritize efforts and plan to migrate remaining applications off Mainframe infrastructure – Auditor (LIEN Accounting) - significant legacy IT debt surrounding this program with multiple alternative solutions available in the market that align with overall IT Architecture strategy (virtual servers)
  - R-TIV-33: Consider providing multi-tier network and infrastructure segregation; 24/7 High Security zone for certain Public Safety infrastructure (CJIS compliant), PCI compliant environment to true cost 24/7 support meeting CJIS and PCI compliance
  - Offer business users ability to select services meeting greater level of compliance as per risk associated with the various information needs

## E.4. BTS Budget and Financial Management Practices (Task V)

### E.4.1. Overview

The BTS Budget and Financial Management Practices includes an assessment, findings and recommendations regarding the BTS budget. Specifically:

- Examine how BTS collects rates for services, analyze the components of the budget and make recommendations for alternate models which address customer concerns related to equity and transparency.
- Recommend areas to reduce operational costs and increase overall efficiency and effectiveness including exploring alternate service delivery models (pay-for-play, cloud computing, etc.).
- Compare the BTS budget against a survey of 2012 government sector budgets to identify possible opportunities (Source: *2013 IT Budget Planning Guide For CIOs, Forrester Research Inc.*).
- Prepare an assessment of the BTS budget including recommendations for alternate cost recovery models and identify areas to reduce operational costs and increase overall efficiency and effectiveness, and strategies for creating a sustainable funding model for ongoing technology lifecycle replacements and major maintenance.

### E.4.2. Current State Findings

Sierra Systems has identified the following current state findings:

#### E.4.2.1. Overview

While the intended scope of the report is limited to BTS, Sierra Systems has found there are significant shadow technology spends by bureaus that BTS does not have visibility to and as a result an analysis of technology spend against leading practices that is limited to BTS provides less value to the city in assessing overall technology spend and identifying potential shortfalls, savings and efficiencies. Findings and recommendations related to a citywide view have been included in this report.

## E.4.2.2. Analysis of Technology Spend

As a leading industry practice, Forrester recommends companies primarily benchmark IT MOOSE (Maintenance, Ongoing Operations, Systems, and Equipment), not the total technology budget:

- IT MOOSE is more consistent from year to year
- IT MOOSE is more consistent between companies
- Less IT MOOSE is generally more desirable

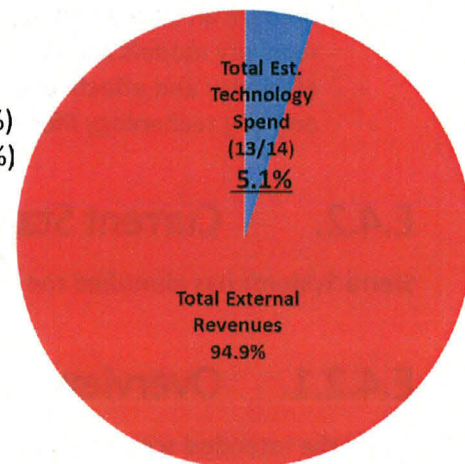
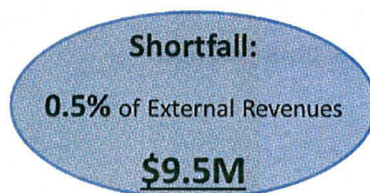
The following are the major elements of IT MOOSE:

- Operating budget: expensed IT operations and maintenance
- Capital budget: replacement equipment or added capacity
- IT depreciation is mostly IT MOOSE

A citywide view of MOOSE is not available, analysis is based on Total Technology spend

**Estimated Citywide Technology Spend as % of External Revenues**

<b>Total External Revenues (13/14)</b>	<b>\$1.95B</b>
<b>Total Recommended Tech Spend</b>	<b>109M (5.6%)</b>
<b>Total Est. Citywide Technology Spend</b>	<b>99.5M (5.1%)</b>



**% of Technology Spend Source:** Bureau Estimated Technology Spend from Col worksheet responses

*\*Est. % Tech missing BOEM and PDC*

**Total External Revenues Source:** 2012/13 Adopted Budget Volume 1

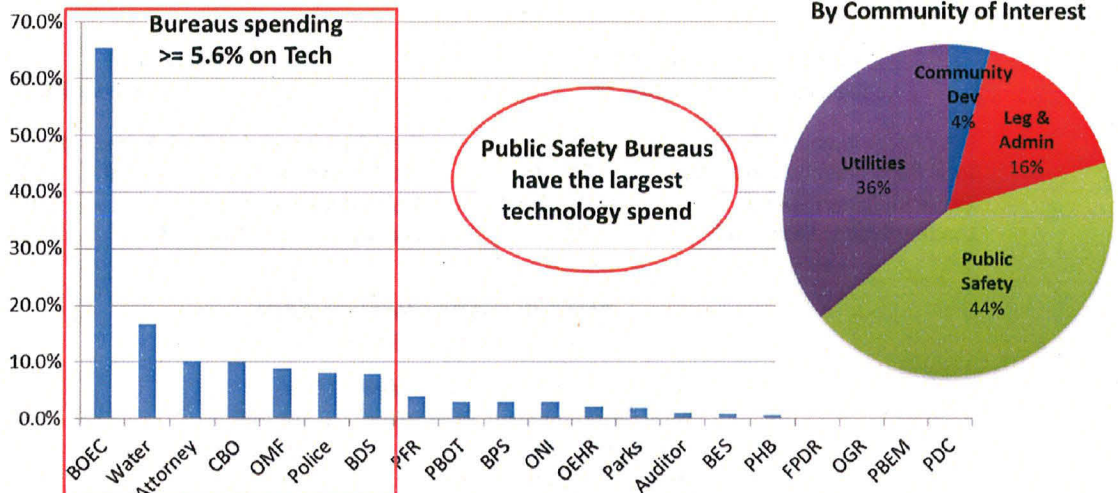
In addition to the above, Sierra has found:

- Overall BTS budget practices are sound and follow industry best practice however there are gaps in understanding of these practices by BTS customers and often BTS staff
- It is recognized that the City has faced overall budget deficits and has had to look for opportunities for savings and efficiencies
- The City does not currently have a reliable view of technology spend citywide; the estimates provided by Bureaus require further validation
- However, taking into account the need for validation, there does none-the-less appear to be a shortfall in the Technology spending as compared against leading practices
- This shortfall explains some of the challenges facing both BTS and Bureaus, e.g.
  - Lack of business continuity plan and emerging technologies (R&D) and security spend



- BTS has absorbed large budget reductions since FY 2006-07
  - BTS approved decision packages eliminated 38 positions and reduced spending by over eleven million dollars
  - These reductions have impacted the ability of BTS to meet the service expectations of its customers
  - Replacement collection programs were cut as part of the reduction process, consider restoration of these programs
  - Funding for major maintenance projects was cut, consider restoration of funding for these projects
- Considering the shortfall, the City is doing well to maintain the existing support levels; additional actions can be taken to further enhance both service delivery and cost control

### % of External Revenue Spent on Technology by Bureau



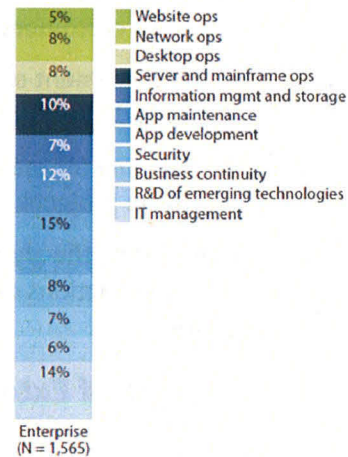
% of Technology Spend Source: Bureau Estimated Technology Spend from Col worksheet responses

\*Est. % Tech missing BOEM, PDC, OGR Total Operating Budget Source: 2012/13 Adopted Budget Volume 1

## E.4.2.2.1. Spend by Functional Category

Source: Forrester, 2013 IT Budget Planning Guide For CIOs

### Forrester Leading Practice Spend As % of Total Technology Budget



- Functional categories of technology spend cannot be easily compared to leading practices
- Sierra Systems was able to review leading practice for the following key categories: Business Continuity 7%, Research and Development 6%, Security 8%
- The City of Portland technology spend in these key functional categories is significantly below leading practice

#### Business Continuity (BCP)

Leading Practice Spend: 7%

Total Recommended Tech Spend	109M
Total Recommended BCP Spend	7.6M (7%)
13/14 Budgeted Spend	0.3M (0.2%)
<b>Leading Practice Shortfall</b>	<b>7.3M</b>

#### Security (SEC)

Leading Practice Spend: 8%

Total Recommended Tech Spend	109M
Total Recommended SEC Spend	8.7M (8%)
13/14 Budgeted Spend	1.1M (1.1%)
<b>Leading Practice Shortfall</b>	<b>7.6M</b>

#### Research and Development (R&D)

Leading Practice Spend: 6%

Total Recommended Tech Spend	109M
Total Recommended R&D Spend	6.5M (6%)
13/14 Budgeted Spend	0.4M (0.4%)
<b>Leading Practice Shortfall</b>	<b>6.1M</b>

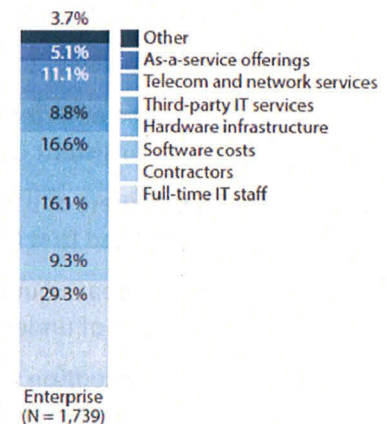
These 3 areas represent 21% of the total recommended technology spend. The total shortfall for these functional areas represents \$21M suggesting a potential need to redirect funds from other areas over and above the \$9.5M tech spend shortfall.

## E.4.2.2.2. Spend by Cost Category

Source: Forrester, 2013 IT Budget Planning Guide For CIOs

- Cost category spending as a percentage of total technology spend cannot be easily compared to leading practices
- Sierra Systems recommends a consolidation of technology spend reporting citywide and consistent use of GL codes to facilitate this analysis

**Forrester Leading Practice Spend  
As % of Total Technology Budget**



## E.4.2.3. Review of BTS Financial Management Practices

### E.4.2.3.1. Major Expenditures Approvals

Sierra Systems identified the following findings for major expenditures approvals:

- A single citywide process to prioritize and monitor major expenditures approvals does not exist; technology projects monitored by an existing Council-approved oversight committee do not need to be reviewed by the Technology Oversight Committee (TOC)
- The existing major expenditures approvals process and roles and responsibilities of BTS and Bureaus is unclear to Bureaus
- Projects are assessed on a first-come-first-serve basis, based on the available funding from individual Bureaus and BTS capacity; perception is key projects are not prioritized
- A significant gap exists around business continuity planning (BCP), need to set aside capital to address this as a priority
- Use of business cases and ROI is not understood or consistent

### E.4.2.3.2. Cost Allocation Model

Sierra Systems identified the following findings for the cost allocation model:

- BTS employs a robust cost recovery model; the model is not well understood by all customers
  - Services are aligned with costs
  - Costs are broken down to two categories, direct costs and indirect costs
  - BTS uses a variety of cost recovery methodologies including metric based rates, allocation based rates and time and materials billing

- BTS perception is the cost recovery model is well balanced between complexity and fairness; this view was not expressed by the bureaus
- Services are billed to customers to help rationalize usage behaviors
- Lack of citywide integration results in lost opportunity and increased risk
  - No ability to see technology spending across the city
  - Use of different GL codes to track technology spend across Bureaus; BTS uses consistent GL codes for services
- Customers of BTS report that technology costs are not easy to decipher – they have expressed that BTS is a ‘black box’
  - Bureaus question the value of the services they receive and are frustrated with the lack of understanding of what they are charged for, ‘everything costs more’
  - Perception vs. Reality - “Urban Legend” exists regarding an OMF 32% overhead charge for BTS services; assumed to be misunderstanding of General Fund allocation
- Lack of mandate to influence cross-Bureau technology spending
  - GL codes are inconsistently used citywide - citywide reporting on technology spend is not readily available and cannot be derived from the current GL coding within SAP
  - Budgets for large projects set within bureaus with no reporting into BTS
- Technology cost recovery is not always well understood; not all stakeholders understand how BTS costs are recovered
  - One example, the apportioned cost of GIS (Geographic Information System) and EBS across bureaus is inconsistent and differences are not always well understood
  - Lack of clarity on financial incentive for bureaus to work with BTS on technology requirements
- BTS provides the following customer outreach on budget and billing, however perception by bureaus of lack of clarity in cost allocation exists
  - Annual rate and interagency workshop
  - Annual budget presentation to the BTS Customer Stakeholder Group (CSG)
  - Rate summary documents are prepared and presented to stakeholders for all of the BTS Corporate Applications, TRACS, GIS, Synergen, CAD, SAP and CIS
  - Regular meetings are held with customers to review interagency and billings
  - Training manuals and booklets
  - Service Level Agreement and a Service Catalog exist
- Bureaus frustration with service catalogue and how to calculate total cost of services; services as defined by the Bureaus
  - E.g. to provide a fully functioning workstation to an employee requires multiple catalogue items – the base workstation, software, network access, email, training, etc.
- Customer perception that technology cost recovery may not align with current business needs



- Bureaus were not consulted in the recent decision to reduce BTS service offerings
- Perception that Bureaus were not engaged in setting of BTS 5 year strategic plan
- Bureaus indicated desire to be involved to ensure changes best meet the needs of the business

### E.4.3. Recommendations

To address the above findings, Sierra Systems provides the following recommendations. These recommendations are a comparison against leading practices; they are not based on an audited financial review.

#### E.4.3.1. Summary

- R-TV-34: The City does not currently have a reliable view of technology spend citywide; recommend clearly define and validate the total citywide technology spend and establish a benchmark for performance, with consistent use of GL codes to facilitate this analysis
- The City of Portland is spending significantly below leading practices on technology as a % of the total operating budget
- Specifically, lack of spend on the 3 key areas (business continuity, research and development and security) introduces risk and lost opportunities for efficiencies
- R-TII-05: Transparency and communication with Bureaus is critical to effective cost management; develop and execute on a change management and communication strategy and plan

#### E.4.3.2. Major Expenditure Approvals Recommendations

Sierra Systems recommends the following for major expenditure approvals:

- R-TV-35: Prioritize major expenditures Citywide (e.g., BCP)
- R-TV-36: Tie major expenditures to a business outcome using a business case approach
- R-TII-10: Build a Citywide roadmap linking business and technology investments
- R-TII-11: Attach clearly defined performance measures
- R-TII-05: Communicate the approvals process and results to stakeholders

#### E.4.3.3. Cost Allocation Model Recommendations

Sierra Systems recommends the following for the cost allocation model:

- R-TV-34: Establish a Citywide mandate, process and structures to create a consolidated view on technology spend with clearly defined performance measures
- Track consumption of citywide technology services and spend on all citywide technology projects; BTS tracks consumption of BTS technology services
- Define use of consistent GL codes across bureaus to track spend; BTS has defined GL codes for BTS technology services

- Establish citywide benchmarks and create a dashboard report
- R-TV-37: Review the cost model for each technology service
  - Start with high volume and high costs services
  - Assess consistency of methodologies
- R-TV-38: Provide a consolidated, easy to read 'bill or invoice' of all BTS costs; expand to include citywide technology costs (confirm ROI)
  - Many Bureaus expressed lack of clarity on what they are charged and which costs they are able to influence
  - Improve on processes with the Bureaus to clarify fixed and variable costs, General Fund overhead charges, and opportunities for Bureaus to control cost
  - Provide training to bureaus on the newly recommended BTS bill - training is available today on the current SAP process
- R-TII-05: Expand and enhance communications with Bureaus; look at ways to engage stakeholders that are not reached through its current outreach methods
  - Define change, communications and training plan
  - Develop a partnership with Bureaus, establish a regular 'account manager' meeting to assess spend
- Continue the current efforts to clarify the BTS service catalogue
  - R-TV-39: Establish a roadmap for service catalogue enhancements based on Bureau priorities; start with the popular services (current initiative underway)
  - R-TV-40: Combine/link multiple BTS services into bundles\* (e.g. a workstation requires software, a network account, email, etc.)
    - Extend catalogue to include all technology services
    - Create close linkages between the definition of services and the total cost of services to Bureaus, for example:

Service Components: Workstation Bundle	Cost
<ul style="list-style-type: none"> <li>• Purchase of BTS standard hardware (HW) (laptop or desktop with monitor, keyboard, mouse)</li> <li>• Purchase of BTS standard operating system software (SW)</li> <li>• Installation of BTS standard SW</li> <li>• Patching</li> <li>• Life Cycle replacements – 5 year schedule</li> </ul>	Cost per base service (\$880 / workstation or laptop)
<ul style="list-style-type: none"> <li>• Installation and support for non-standard HW or SW</li> <li>• Workstation moves</li> </ul>	Billable service add-ons
Email and network account	Cost per base service
Helpdesk support (e.g. troubleshooting)	BTS IA
Purchase antivirus SW	Security IA
Purchase BTS standard and non-standard business SW (e.g. office productivity, CAD, etc.)	Bureau costs (variable based on specific SW)
"How to use" training on application features and SW	Multiple (e.g. Bureau costs, COPPEA fund)

#### E.4.3.4. Alternate Cost Recovery Model Recommendations

- R-TV-41: Assess high volume and high cost services to determine if the cost model can be adjusted to more accurately reflect consumption; recommend extending assessment beyond BTS to support citywide technology cost control mandate
  - An example beyond BTS is to review the EBS/SAP chargeback; an option is to segment the ERP by major module or function and identify three tiers of usage — heavy, medium, and casual, with different prices for each
- R-TV-42: Assess areas where an external or third-party provider would be appropriate
  - Examples include data center, call center, SAP support
- R-TV-40: Continue the current efforts to clarify the BTS service catalogue; linking services to cost recovery

#### E.4.3.5. Strategies for a Sustainable Funding Model

- R-TV-43: Apply a 'tax' against project budget approvals, e.g. mandatory x% to support citywide disaster recovery
- R-TV-44: Consider options for expansion of the citywide Innovation Fund to fund cross-bureau initiatives
- R-TV-45: Establish a clear mandate and processes for Bureaus enabling efficiencies through consolidation and collaboration
- R-TV-46: Complete an audit of services charged vs. used
  - E.g. retired/returned laptops and phones, and services provided by BTS that are not fully charged back to bureaus
  - While customers billed for only what BTS records indicate they have in inventory, Bureaus have provided examples of where the inventory is inaccurate
- R-TV-34: Modify the GL to accommodate effective cross-bureau reporting on technology costs
- R-TV-38: Create a consolidated 'bill or invoice' of all BTS and citywide technology costs

#### E.4.3.6. Opportunities for Efficiencies

Sierra Systems has identified the following opportunities for application efficiencies:

- R-TIV-32: Retire the Mainframe
  - \$900K/year savings
  - The auditor is soon to be the only user on the mainframe; who pays the cost for a move onto another platform?
- Data Center Consolidation
  - R-TV-47: Consolidation is complete, now look at ways to complete the virtualization process to fully realize savings
    - Enables creation of a secure 2-tier data center to support business continuity

- R-TV-48: Assess duplication across, and even within, Bureaus
  - Document management and archival systems
  - Time tracking and purchasing systems
  - Asset management systems
  - Contact management systems
  - Multiple 1-800 numbers exist
    - Typically this results in additional ancillary costs e.g. staffing costs, overtime, call management systems
- Preventative measures can be taken to avoid additional unnecessary duplication
  - R-TII-12: Create an enterprise view of the business architecture and assess potential future duplication
    - Examples of existing applications where Bureaus are assessing other solutions: Enterprise Service Bus, Asset Management
  - R-TV-49: Move forward with Shared Data and Business Intelligence (BI) opportunities
    - BTS is responsible for the maintenance of the corporate data repository
    - Reducing duplicate instances of shared data will improve data integrity and reduce costs

Sierra Systems has identified the following opportunities for application efficiencies:

- R-TV-34: Create a consolidated view, reporting process and dashboard of technology spending across the city
  - Determine the total cost of technology as a benchmark
  - Align with the annual budget cycle
  - Align with an enterprise architecture roadmap
- R-TV-50: Consider a results-based project/major expenditure request model
  - Align project approvals with the business strategy
  - Prioritize against a business outcome using a business case approach; clarify a common business case and ROI model



## E.5. Citywide Technology Governance Model (Task VI)

### E.5.1. Overview

The Citywide Technology Governance Model includes development of an assessment framework, a current state assessment, findings and recommendations regarding the existing governance model/framework for citywide technology investment priorities and decisions. Specifically:

- Identify the current state of the IT governance framework (what do stakeholders think about how IT governance framework currently operates).
- Gather issues, concerns and vision to formulate a proposed future state of the framework (how would stakeholders like to see IT governance operating). Include a description of the potential organizational benefits of implementing the proposed future governance state (these benefits may include, for example, efficiencies, transparency, economies of scale, consolidation opportunities, enabling of enterprise architecture, and cost savings/Return on Investment (ROI)).
- Develop an IT governance evaluation framework and perform the GAP analysis.
- Identify governance specific opportunities that may require rationalization and prioritization.
- Present a framework that will form an agreed upon future state of IT Governance and the roadmap to achieve it.

### E.5.2. Technology Governance Framework

Sierra Systems has defined the following leading practice technology governance framework to assess the current state of the existing Citywide governance model.

- Governance is an enabler of effective Citywide technology strategy and management
- Current state is deficient in higher-level, Citywide technology governance to enable bureau input and buy-in to technology direction, priorities and decisions
- As an enabler, governance must address key “requirements” to serve effective Citywide technology management
- Assessment of current state + review of leading practices (Includes practices identified in 2005 City Auditor Report on Best Practices in IT Governance) in technology governance suggests 8 critical requirements as an evaluation framework - to assess the current state of technology governance and propose revisions for the future
  1. **Strategic Alignment** – Governance must provide for strategic direction of technology – culminating with clear strategic outcomes and benefits expected from technology. Organizations should have clear strategic and business objectives for technology to align with and orient to.
  2. **Value Delivery** – Governance must support the organization in defining its total investment in technology and driving maximum business value from it – with measureable ‘return on investment’ against stated strategic outcomes and benefits expected.

3. **Risk Management** – Governance must enable processes in place to ensure that technology risks have been adequately identified, managed and mitigated.
4. **Resource Management** – Governance must provide high-level direction for sourcing and use of technology resources and ensure there is an adequate technology capability and infrastructure to support current and expected future business requirements.
5. **Performance Measurement** – Governance must establish processes to track and report on technology performance against stated strategic outcomes and benefits expected.
6. **Supported from the Top** – Governance must manifest and engage the commitment from the organization's executive-level backed by clear mandates, accountabilities and reporting expectations.
7. **Bringing technology under control across the Enterprise** - Governance must support the organization in bringing technology under control through clear authorities and mandates, formally chartered and structured committee processes and compliance frameworks.
8. **Stakeholders Fully Engaged** – Governance must fully engage technology clients and stakeholders in setting strategic direction and expectations of technology across the organization

### E.5.3. Current State Findings

#### E.5.3.1. Technology Governance Framework Evaluation



Status Key : R = process doesn't exit, O = ineffective, impacts to other processes  
Y = exists, incremental improvements, G = exists, defined processes, N = neutral

Requirement	Status	Owner	Notes
1. Strategic Alignment	O	Unclear (Presumed BTS)	<ul style="list-style-type: none"> <li>• Strong Citywide (CW) Strategic plan for technology to align to/orient with – as well as some Bureau business plans</li> <li>• Lack of consolidated &amp; cohesive Technology Vision &amp; Master Plan.</li> <li>• BTS has an IT plan for its operations – little input into plan from stakeholders</li> </ul>
2. Value Delivery	Y	Unclear (OMF Finance?)	<ul style="list-style-type: none"> <li>• No CW view on total technology costs and investments. – prerequisite to a Citywide return on investment framework (which also does not exist)</li> <li>• No CW technology priority setting process engaging senior management (beyond BTS Budget process)</li> <li>• 90% of total budget estimated in BTS control – not validated</li> <li>• Stakeholders concerned about inadequate transparency into BTS costs + cost allocation formulae</li> </ul>



Requirement	Status	Owner	Notes
3. Risk Management	O	Unclear	<ul style="list-style-type: none"> <li>No CW technology-specific risk management framework in place – and aligned to CW risk management processes</li> <li>City's negative experience with technology project risk warrants higher attention – however, unclear who would own this or where it would be housed (BTS?, CW Risk Management "centre")</li> <li>Technology Oversight Committee focusses on major technology project risk – but not all-of-IT. However, good venue for executive engagement on Technology Risk (Commissioners present)</li> </ul>
4. Resource Management	G	BTS	<ul style="list-style-type: none"> <li>CW technology resources all notionally housed at BTS – though some are 'allocated out' (and paid for) to bureaus at their request</li> <li>If bureaus have \$ they can hire technology resources (via BTS) – drives "bureau-specific" vs. "best use of technology resource across the City" orientation</li> </ul>
5. Performance Measurement	Y	Unclear	<ul style="list-style-type: none"> <li>No Technology Value Framework or CW technology performance standards supported by performance measures and reporting processes</li> <li>No regular reporting to City Executive and Council against an outcome-based performance management framework</li> <li>Good measures in BTS Strategic Plan – unclear how these are tracked and reported (and by whom to whom).</li> <li>Technology performance measurement tends to be more at SLA level for services to bureaus rather than technology as a whole.</li> </ul>
6. Support from The Top	O	OMF?	<ul style="list-style-type: none"> <li>Strong sense that technology is "critical" to bureau business success. However, no coordinated, strategic Executive body focused on IT commensurate to its perceived current and future importance</li> <li>CW technology governance, where it exists, is at a junior manager level – and focused on specific technology service problems/requests; not strategy and CW direction</li> <li>Limited bureau input into/knowledge of current BTS <i>Strategic Plan 2011-14</i></li> </ul>
7. Bringing technology under Control	G	BTS (as per 2003 IT Consolidation ordinance)	<ul style="list-style-type: none"> <li>2003 Consolidation ordinance confers a strong, central authority and mandate for BTS for all core technology. CTO exempts/excepts "out" specific technology applications on approved request.</li> <li>Bureau-specific systems and applications appear exempted from BTS control – their definition and boundaries open to interpretation</li> <li>No clear coordinating mechanism between BTS and "pockets of IT" in bureaus – to support a CW technology control environment</li> <li>Specific technology exemptions cited in 2003 – unclear if these have been reviewed to determine if still warranted or in alignment with the current direction of BTS and City (i.e. Water-SCADA &amp; Transportation –Traffic Mgt)</li> <li>Bureaus want BTS to be more proactive and forward looking – beyond "just keeping the lights on" in technology infrastructure. CTO current mandate appears deficient to support strategic and digital leadership for CW technology that bureaus want</li> </ul>



Requirement	Status	Owner	Notes
8. Stakeholders Fully Engaged	Y	OMF?	<ul style="list-style-type: none"> <li>Current governance deficient in senior-level stakeholder engagement – able to make decisions for their bureaus, able to withstand senior organizational change</li> <li>Current Customer Stakeholder Group engages bureaus with BTS – but more junior-level bureau management involved; more operationally and technology- focused</li> <li>BTS TBCs engage BTS clients at operational/service level – not on understanding BTS “service-to-strategy” alignment to bureau strategies and business plans.</li> <li>CTO engaging Bureau directors individually and directly – “governance by walking around”</li> <li>Limited forums for collaboration among “like businesses” and bureaus around common technology service needs. Some successful models in play (GIS); other s need to be facilitated (i.e. common approaches to technology support for disaster recovery, mobile digital devices for field and public safety staff)</li> </ul>

### E.5.3.2. Governance Themes

On the topic of Citywide IM/IT governance, the following prevailing themes emerged out of an extensive set of interviews held with bureau directors and Bureau of Technology Services (BTS) stakeholders to signal the need for future developments in this area:

- IM/IT is crucial to the success of bureau business – yet bureaus expressed they had very limited involvement in the setting of strategic direction and priorities for Citywide IM/IT. While there is an IT strategic plan for BTS, there is not one for the City as a whole. Most bureaus also lack clear business or technology plans that set out requirements that BTS can target to enable.
- Executives do not believe they have an adequate view on the entire investment of IM/IT in the City or the management of risk associated with IM/IT (beyond major project risk management through the Technology Oversight Committee)
- Respondents cited their interest in stronger collaboration not only with BTS (on the development of Citywide IM/IT plans) but among their peer bureaus (on common business objectives and requirements that could be served by IM/IT)
- The Chief Technology Officer (CTO) is expected to provide greater strategic leadership for Citywide IM/IT – particularly as this relates to assessing technology trends and developments that could further assist the City in delivering its services.
- While Citywide IM/IT governance appears to be working at the technical or operational levels (i.e. Customer Stakeholder Group), there is a serious executive-level governance deficit at the strategic and priority-setting levels.

### E.5.3.3. Key Requirements for Governance Building

The City of Portland needs to build and adopt a strategic IM/IT governance process that will be responsive to and reflective of input received during our project interviews and workshops.



From our analysis of this input, the following should be considered as key requirements of governance-building going forward:

- Involve and engage bureau executive in IM/IT planning commensurate with the importance attached to IM/IT as a critical driver of Bureau business now and in the future – including the creation of a Citywide IM/IT strategic plan and priorities (beyond the current BTS-focussed plan),
- Enable City executives to have an integrated Citywide IM/IT value framework – including a comprehensive and transparent view on total IM/IT costs, investments and risks across the City (i.e. not just those in the BTS domain; not just those risks associated with major projects [as currently covered by the Technology Oversight Committee]),
- Strengthen performance reporting and accountability against stated IM/IT strategic outcomes
- Engage bureaus in planning and priorities for corporate IM/IT systems and applications within BTS domain (Bureau collaboration with BTS),
- Foster intra-bureau collaboration among peer bureaus on like or common business themes and technology supports (Bureau collaboration among themselves with BTS),
- Refresh the mandate of the BTS CTO to provide for a more innovative, transformational focus in the service of city business, and
- Include a mechanism for Citywide sponsorship and funding of strategic IM/IT initiatives that benefit multiple bureaus (vs. current requirement that a single bureau sponsor multi-bureau initiatives and absorb associated risk). Task V proposes expansion of the citywide Investment Fund to fund cross-bureau initiatives to enable this recommendation.

#### E.5.3.4. Rationale for Change

The rationale for change in governance in the City of Portland is outlined below:

- Respond to Bureau directors 'desire to have higher involvement and engagement in CITYWIDE IM/IT planning commensurate with the importance that they ascribe to IT as a critical enabler of their business needs. The current engagement model of BTS CTO "one-to-many" contacts with individual bureaus supplemented by technical collaboration through the Customer Stakeholder Group (CSG) is recognized as an improvement over previous practices. However, it is considered neither as efficient nor as effective as it needs to be to chart the City's path forward in a collaborative model.
- Current state suggests that bureaus envisage a more strategic role for the BTS CTO in supporting innovation in service delivery by identifying leading-edge IT applications that can support current and future business needs.
- The lack of a CITYWIDE IM/IT strategic plan process that bureaus can engage in at the business level is a weakness in the current state. BTS has a strategic plan for IM/IT in its domain. However, there is little evidence of substantive bureau involvement in the development of this plan. Frequent reports are given at the CSG; however these meetings are one way communications out to the bureaus with minimal opportunity for feedback.

- Enables stronger and clearer accountability and executive-level reporting – supported by performance measurement and reporting against stated Citywide strategic priorities and outcomes sought for IM/IT.
- Bureaus expressed an interest in collaborating not only with BTS on IT but with other “like-minded” bureaus on key, common business IT applications and devices (i.e. GIS, mobile device, emergency response technologies).
- While IT infrastructure concerns are seen to be squarely within BTS’ domain, there is a significant stated interest in broader stakeholder engagement at this layer – especially on infrastructure renewal initiatives (i.e. operating systems).
- The City’s 2002 Ordinance 177852 that centralized foundational IT functions in BTS has not been subject to a strategic review in over a decade and warrants a re-fresh. At present, there is no Executive level IM/IT –focussed governance body that could be tasked to undertake this work.
- A cluster approach to grouping bureaus along lines of common businesses and interests has a precedent within the City of Portland (Finance, Human Resources) and in other leading IM/IT organizational models (i.e. the State of Oregon Department of Transportation; San Mateo County, CA and the Government of Ontario, Canada [which has had a Col model in operation since 2001].)

## E.5.4. Recommendations

In response to the key requirements of governance-building identified above, we recommend changes in IM/IT governance processes and mandates in the City as follows:

### E.5.4.1. Governance Processes

R-TVI-51: Undertake a review of the City’s 2002 ordinance that centralized foundational IT functions in BTS to assess functions that are currently in and out of scope for BTS (e.g. EBS) in relation to the newly proposed governance and organizational models, and recommend changes as appropriate to bring functions into alignment with the new models.

R-TVI-52: We recommend an integrated, three-level governance process be developed. The key outcomes sought from these processes are:

- To elevate the importance of IM/IT in the City (as critical enabler of City business and services) commensurate with the importance stated by bureau directors in interviews
- To enhance cross-bureau input in developing Citywide IM/IT strategies, policies and priorities.
- To re-set accountabilities in order to enable the City to gain an integrated, comprehensive view on total IM/IT investments and risks as well as manage this portfolio in alignment with City strategy and priorities.

The three governance committee layers are proposed:

- Information Technology Executive Committee (ITESC)
- Communities of Interest (Col)

- Advisory Committees

Details on scope and reporting relationships for the three governance committee layers is included in the Task VI final report referenced in Appendix A.

### E.5.4.2. CTO Mandate

The current mandate of the CTO, BTS is as articulated in Administrative record BTS 1.01 -*BTS Vision, Mission, Values, Duties and Authorities of CTO*. This mandate was set in 2002 and does not appear to have been reviewed and updated since that time to accommodate new directions and requirements of the role. We recommend that the CTO role be renewed to achieve the following outcomes:

- R-TVI-53: To add new roles and authorities not currently reflected in the mandate - including:
  - Responsibilities of a City Chief Digital Officer – forward-looking consideration of innovative IM/IT systems and applications that can enable City’s current and future business.
  - Authority for facilitating and mandating common business systems and applications that can be developed collaboratively among bureaus within the Col and Infrastructure frameworks and implemented as common solutions
  - Authority to audit bureau compliance with CTO’s Citywide IM/IT standards, processes and administrative rules and act on or recommend to ITESC remediation on variances and breaches
  - Authority to conduct an annual review of exceptions to bureaus with respect to specific standards, processes and administrative rules as granted by CTO to Bureau Directors (on written request) and recommends to ITESC continuation/revision of exceptions.
- R-TVI-54: To update role to better accommodate new responsibilities and align with industry standards by renaming/re-classifying the Chief Technology Officer (CTO) position as Chief Information Officer (CIO). This would be commensurate with the broader, CITYWIDE mandate on IT standards, policies and administrative rules envisaged for the CTO as well as the expressed desire by bureaus to see the role have broader influence on forward-looking IM/IT direction and technology.

### E.5.5. Decisions

Decision	Owner/Accountability
Approve recommended Governance Processes and move to implementation through drafting of committee Terms of Reference – including issues management and logistics and confirming membership and reporting.	Approval: Council Implementation: CTO-BTS
Renew existing CTO mandate to accommodate/clarify recommended authorities and mandates	Draft new Mandate: CTO Approve: CAO
Revise CTO title to Chief Information Officer (CIO) – to better reflect the scope and mandate proposed for this role	Revise Job Description: CAO Approve: Council

## E.5.6. Implementation Considerations

The following implementation considerations and issues will need to be addressed and direction confirmed to inform an implementation plan for a new Citywide IM/IT governance model.

### E.5.6.1. Governance Processes

- Not all Bureaus can be on ITESC or it would be too unwieldy to manage. At the same time, governance processes need to be able to address/accommodate smaller bureau concerns and priorities lest they get lost under the weight of larger bureau issues or budget capacity to afford to pay for what they need. Therefore, a representative approach is recommended (i.e., for ITESC - 6 large bureaus [as measured by IT spend] + 6 small bureaus)
- Terms of References need to be drafted and formalized for ITESC, Cols and Infrastructure Advisory Committee. Clear mandates to be approved and conferred from City Executives.
- Bureau representatives on ITESC and Cols must be empowered to make decisions and commitments on behalf of their bureaus.
- A funding model will need to be determined to support and fund common business tool projects in Cols and other enterprise-wide solutions (i.e. bureau contributions, BTS base budget contributions)
- Confirm alignment, reporting and relationship of governance bodies to existing senior-level bodies – i.e. Council, the Technology Oversight Committee (TOC).

### E.5.6.2. CTO Mandate

- Revised mandate statement for BTS CTO needs to be drafted (as per Administrative [record] BTS 1.01 -BTS Vision, Mission, Values, Duties and Authorities of CTO) to be approved and conferred from City Council.
- If ITESC is approved and brought quickly operational, it would be a good executive-level body to deliberate on a new mandate and role description for the CTO. However, given that the CTO chairs this committee, a chair-designate (i.e. the CAO) may have to be assigned to lead this discussion and decisions.



## E.6. Capability Maturity Model Integration (CMMI) Appraisal (Task VII)

### E.6.1. Overview

The Capability Maturity Model Integration (CMMI) Appraisal includes an appraisal based on the CMMI version 1.3 Model from the Software Engineering Institute at Carnegie Mellon University Specifically:

- Establish a baseline CMMI maturity level 1-5 for BTS application development by using the Class C Standard CMMI Appraisal Method for Process Improvement (SCAMPI) methods. Complete a SCAMPI C assessment and provide a final report.
- Provide recommendations for targeted next steps to improve organizational process maturity and a GAP analysis between the current maturity and CMMI levels 2 and 3. Include guidelines for effort and costs to implement the recommendations included in the report.
- Provide an assessment of how the BTS CMMI maturity level compares to other government technology organizations of similar size. Include in this report 1) a review against the Published Appraisal Results (PARS) database, and 2) a market scan of similar clients or entities to validate the PARS findings.

### E.6.2. Current State Findings

Sierra Systems engaged an external vendor to complete the BTS CMMI assessment. The scope of the CMMI assessment was to:

- Evaluate BTS and SAP against the Maturity Level 2 and 3 Process Areas
- Evaluate areas of potential risk with the current implementation
- Provide recommendations for addressing weaknesses and gaps
- Compare BTS and SAP to comparable organizations

The CMMI maturity levels (1-5) are described below:

Maturity Level	Focus	Process Areas	
5 Optimizing	<i>Continuous Process Improvement</i>	Organizational Performance Management Causal Analysis and Resolution	
4 Quantitatively Managed	<i>Quantitative Management</i>	Organizational Process Performance Quantitative Project Management	
3 Defined	<i>Process Standardization</i>	Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition Organizational Training Integrated Project Management Risk Management Decision Analysis and Resolution	
2 Managed	<i>Basic Project Management</i>	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance	
1 Initial			

- Based on the analysis, BTS currently performs many of the Project Management and Engineering practices the CMMI would expect
- Given the CMMI Maturity Level definitions, BTS exhibits behaviors consistent with a Maturity Level 1 organization

Maturity Level 2							Maturity Level 3										
REQM	PP	PMC	SAM	MA	PPQA	CM	RD	TS	PI	VER	VAL	OPF	OPD	OT	IPM	RSKM	DAR

GG 1	GG 2									GG 3	
GP 1.1	GP 2.1	GP 2.2	GP 2.3	GP 2.4	GP 2.5	GP 2.6	GP 2.7	GP 2.8	GP 2.9	GP 2.10	GP 3.1

<b>LEGEND:</b>
<span style="display: inline-block; width: 15px; height: 10px; background-color: green; border: 1px solid black;"></span> Practiced by BTS
<span style="display: inline-block; width: 15px; height: 10px; background-color: yellow; border: 1px solid black;"></span> Partially Practiced by BTS
<span style="display: inline-block; width: 15px; height: 10px; background-color: red; border: 1px solid black;"></span> Not Practiced by BTS

- Details explaining each acronym, the purpose of each Process Area, and the scores are provided in the back up slides at the end of the CMMI Task VII report (see Appendix C)
- The Generic Goals (GG) indicate the level of institutionalization of the quality system within an organization and gauges the Maturity Level
  - The above GG scores represent an aggregate across all Process Areas
- The CMMI expects for a Maturity Level 3 organization that an organizational set of standard processes exists and is used by all projects
  - There is a lot of variability in how work is performed in BTS person-to-person, project-to-project, and group-to-group
  - Most of the policies, processes, procedures, and plans for the processes expected by the CMMI (see Slides 55 – 141 in the CMMI Task VII report) are not currently documented
- In addition, an infrastructure for process improvement is expected to be in place
  - Even though there are some process improvement activities, there is no established infrastructure for pro-actively improving the processes and for objectively evaluating adherence to the documented processes

### E.6.3. Recommendations

The following recommendations have resulted from the CMMI assessment:

- R-TVII-55: Management should clarify commitment to process improvement
  - Identify sponsorship and support for process improvement
  - Communicate throughout the organization
  - Start small, address easy wins, don't try to do it all at once, but start
  - Define and document the processes each group currently follows to support a specific Bureau, e.g. Police IT, PMO, etc.
  - Identify Best Practices that can be standardized across BTS
- R-TVII-56: One decision that needs to be made immediately is how common do you want the processes across BTS – don't try to do too much at once

- Initially it would be best to define and document the processes each group currently follows to support a specific Bureau, e.g. Police IT, PMO, etc.
- As the City gains experience with these individual sets of standard processes, then look for Best Practices that are common across the Bureaus and can be elevated to a standard process across BTS
- R-TVII-57: Establish a Process Improvement infrastructure
  - Management Steering Group (MSG) – Sponsors process improvement initiative, provides direction, oversight, and funding (part time support)
  - Engineering Process Group (EPG) – Plans and manages process improvements, establishes the organizations set of standard processes and measurement repository, charters and manages Process Action Teams to work specific improvements (combination of full time and part time support)
  - Process Action Teams (PATs) – Temporary teams that work on improvements to specific processes and report status to the EPG (full or part time support)
  - Organizational Training Group (OTG) – Plans and manages the delivery of training to the organization and defines specific training required to perform each job role. Training includes process training, technical/discipline training, and management training (combination of full and part time support)
  - Process and Product Quality Assurance Group (QAG) – Regularly plans and performs objective evaluations of the adherence of the processes in use throughout the organization and on all projects (full time support)
- R-TVII-58: Provide the following process improvement training:
  - Introduction to the CMMI-DEV v1.3 (3 days)
  - Requirements Engineering Techniques (2 – 3 days)
  - How to Establish a PPQA Group and Perform Audits (2 – 3 days)
  - How to Perform Reviews and Inspections (2 – 3 days)
  - How to Assess and Manage Risks and Issues (2 – 3 days)
  - How to Establish a Measurement Capability and Use Data to Make Decisions (4 – 5 days)
  - How to Perform Configuration Management (2 – 3 days)
- R-TVII-59: After establishing the MSG and EPG, review each of the identified weaknesses, gaps, and improvement suggestions
  - Rank and prioritize the list
  - Put plans in place address the list
  - Charter PATs to work the items on the list
  - Use the IDEAL model for process improvement (see Slide 22 of the CMMI Task VII report)
- R-TVII-60: Periodically assess progress towards the process improvement goals and determine new issues, gaps, and strengths



## F. Summary of Recommendations

The following is a summary of recommendations, sorted by priority and Class.

Number	Category	Recommendation	Class	Priority
R-TV-44	Strategies for a Sustainable Funding Model	Consider options for expansion of the citywide Innovation Fund to fund cross-bureau initiatives	Class I: Council	1
R-TV-45	Strategies for a Sustainable Funding Model	Establish a clear mandate and processes for Bureaus enabling efficiencies through consolidation and collaboration	Class I: Council	1
R-TVI-52	Governance	Approve recommended Governance Processes and move to implementation through drafting of committee Terms of Reference – including issues management and logistics and confirming membership and reporting.	Class I: Council	1
R-TVI-54	Governance	Revise CTO title to Chief Information and Digital Officer – to better reflect the scope and mandate proposed for this role	Class I: Council	1
R-TV-34	Budget	Clearly define and validate the total citywide technology spend and establishing a benchmark for performance, with consistent use of GL codes to facilitate this analysis	Class I: Council	1
R-TII-03	Organizational Model	Clearly define role and responsibilities of BTS vs. Bureaus	Class II: CAO	1
R-TII-10	Business Processes	Work with Bureaus to build a citywide technology Vision and Master Plan and Bureau business strategy and plan; develop multi-year aligned technology and business roadmap to allow for needed prioritization and simplification of support	Class II: CAO	1
R-TV-35	Major Expenditures Approvals	Prioritize major expenditures Citywide (e.g. Business Continuity Plan (BCP))	Class II: CAO	1
R-TV-36	Major Expenditures Approvals	Tie major expenditures to a business outcome using a business case approach	Class II: CAO	1
R-TIV-32	Opportunities for Efficiencies	Prioritize efforts and plan to migrate remaining applications off Mainframe infrastructure – Auditor (LIEN Accounting). Potential for largest annual savings.	Class II: CAO	1

Number	Category	Recommendation	Class	Priority
R-TVI-53	Governance	Renew existing CTO mandate to accommodate/clarify recommended authorities and mandates	Class II: CAO	1
R-TII-01	Organizational Model	Consider implementation of a new organizational model: Plan, Build, Run	Class III: CTO	1
R-TII-05	Organizational Model	Create and implement a comprehensive change management strategy and plan to support organizational transformation at all levels; communicate with technology staff and Bureaus	Class III: CTO	1
R-TIV-25	Communities of Interest	Ensure Business transparency, contribution in technology prioritization process – Community of Interest	Class III: CTO	1
R-TVII-55	CMMI	Management should clarify commitment to process improvement	Class III: CTO	1
R-TIV-21	Communities of Interest	Create a comprehensive application rationalization and consolidation program targeting Asset Management, Work Order and Billing Systems including an Asset, Work Order, Billing Community of Interest	Class IV: Operations	1
R-TV-37	Cost Allocation Model	Review the cost model for each service; start with high volume and high costs services; assess consistency of methodologies	Class IV: Operations	1
R-TIV-26	Expenditures	Target approx. 5-5.5% total IT spend (4% on Maintenance, Ongoing Operations, Systems and Equipment - MOOSE)	Class I: Council	2
R-TII-08	Service Delivery Model	Prioritize business continuity and disaster recovery; identify team with clearly defined roles and responsibilities	Class II: CAO	2
R-TII-14	Business Processes	Create Citywide technology-specific risk management framework	Class II: CAO	2
R-TIV-24	Expenditures	Move towards a standardized accounting model that provides an ability to provide a consolidated IT spend based on % of revenue generated citywide	Class II: CAO	2
R-TIV-27	Expenditures	Prioritize up to 7% of current IT spend on dedicated business continuity capability	Class II: CAO	2
R-TIV-28	Expenditures	Prioritize up to 6% of current IT spend on emerging technologies (R&D)	Class II: CAO	2
R-TIV-29	Expenditures	Prioritize up to 8% of current IT spend on IT security capabilities	Class II: CAO	2
R-TIV-30	Expenditures	Consider allowing Bureau stakeholders opportunity to select reduced service levels to offset costs associated with Business Continuity and R&D	Class II: CAO	2
R-TIV-31	Opportunities for Efficiencies	Consider fast tracking phase 2 & 3 Office 365 initiative for smaller Bureaus in need of greater application and case management capabilities	Class II: CAO	2



Number	Category	Recommendation	Class	Priority
R-TV-43	Strategies for a Sustainable Funding Model	Apply a 'tax' against project budget approvals, e.g. mandatory x% to support citywide disaster recovery	Class II: CAO	2
R-TV-50	Opportunities for Efficiencies	Consider a results-based project/major expenditure request model	Class II: CAO	2
R-TVI-51	Governance	Undertake a review of the City's 2002 ordinance that centralized foundational IT functions in BTS to assess functions that are currently in and out of scope for BTS (e.g. EBS) in relation to the newly proposed governance and organizational models, and recommend changes as appropriate to bring functions into alignment with the new models.	Class II: CAO	2
R-TII-02	Organizational Model	Define clear role and responsibilities of the enterprise architect	Class III: CTO	2
R-TII-04	Organizational Model	Review terms of reference for existing groups, e.g. CSG, to assess role with new organization structure and governance model	Class III: CTO	2
R-TII-09	Service Delivery Model	Consider and review options for outsourcing to support the new organization structure	Class III: CTO	2
R-TII-11	Business Processes	Develop KPIs with performance reporting processes and supporting information management capabilities to enable performance monitoring against the roadmap	Class III: CTO	2
R-TII-13	Business Processes	Create Customer Relationship Management Strategy under CTO	Class III: CTO	2
R-TIII-15	Skills and Competencies	Create Citywide Technology Training Advisory Group (TTAG) in a federated model providing for BTS and Bureau management	Class III: CTO	2
R-TIV-22	Communities of Interest	It is recommended that a Mobile Community of Interest (COI) Task Force be initiated to address the disparate mobile needs of the city.	Class III: CTO	2
R-TIV-23	Communities of Interest	It is recommended that the City consider implementing a Cloud / As-a-Service Community of Interest Task Force (Agile); pilot program combining subject matter area experts across the various business service disciplines	Class III: CTO	2
R-TV-42	Alternate Cost Recovery Models	Assess areas where an external or third-party provider would be appropriate	Class III: CTO	2
R-TVII-56	CMMI	One decision that needs to be made immediately is how common do you want the processes across BTS – don't try to do too much at once	Class III: CTO	2
R-TII-06	Service Delivery Model	Work with Bureaus to create service delivery Guiding Principals	Class IV: Operations	2
R-TII-07	Service Delivery Model	Focus on execution of operational efficiencies (see Tasks IV and V recommendations) to allow for time required for architecture, benchmarking and emerging technologies	Class IV: Operations	2

Number	Category	Recommendation	Class	Priority
R-TIII-16	Skills and Competencies	Identify strategic and priority training needs for organizations, projects and key resources to achieve citywide objectives.	Class IV: Operations	2
R-TIII-17	Skills and Competencies	Mobilize expert resources as mentors, cross-training and cross-bureau, to augment training and development.	Class IV: Operations	2
R-TIII-18	Skills and Competencies	Evaluate training outcomes, KPIs, gaps, to ensure consistent quality performance citywide	Class IV: Operations	2
R-TIV-19	Communities of Interest	Create a continuous program under the governance of the proposed Community of Interest model to continuously monitor and assess business cases supporting further application consolidation, e.g. create a Citywide Contact Management Community of Interest Task Force	Class IV: Operations	2
R-TIV-20	Organizational Structure	Provide a technology project report card showcasing existing in progress projects with potential enterprise capabilities	Class IV: Operations	2
R-TV-38	Cost Allocation Model	Provide a consolidated, easy to read 'bill or invoice' of all BTS costs; identify opportunities for Bureaus to control cost; explicitly clarify any General Fund overhead charges; provide training to bureaus on the new BTS bill	Class IV: Operations	2
R-TV-39	Cost Allocation Model	Continue the current efforts to clarify the BTS service catalogue; establish a roadmap for service catalogue enhancements based on Bureau priorities; start with the popular services (current initiative underway); create close linkages between the definition of services and the total cost of services to Bureaus	Class IV: Operations	2
R-TV-41	Alternate Cost Recovery Models	Assess high volume and high cost services to determine if the cost model can be adjusted to more accurately reflect consumption	Class IV: Operations	2
R-TV-46	Strategies for a Sustainable Funding Model	Complete an audit of services charged vs. used	Class IV: Operations	2
R-TV-47	Opportunities for Efficiencies	Look at ways to complete the virtualization process to fully realize savings	Class IV: Operations	2
R-TV-48	Opportunities for Efficiencies	Assess duplication and consolidate where appropriate: asset management, document management, time tracking and purchasing, contact management, 1-800 numbers	Class IV: Operations	2
R-TVII-57	CMMI	Establish a Process Improvement infrastructure	Class IV: Operations	2
R-TVII-59	CMMI	After establishing the MSG and EPG, review each of the identified weaknesses, gaps, and improvement suggestions	Class IV: Operations	2



Number	Category	Recommendation	Class	Priority
R-TV-49	Opportunities for Efficiencies	Move forward with Shared Data and Business Intelligence (BI) opportunities; assess existing and potential future duplication	Class III: CTO	3
R-TII-12	Business Processes	Create initiative to complete citywide architectures, aligned with newly defined role of enterprise architect	Class IV: Operations	3
R-TIV-33	Opportunities for Efficiencies	Consider providing multi-tier network and infrastructure segregation; 24/7 High Security zone for certain Public Safety infrastructure (CJIS compliant), PCI compliant environment to true cost 24/7 support meeting CJIS and PCI compliance	Class IV: Operations	3
R-TV-40	Cost Allocation Model	Continue the current efforts to clarify the BTS service catalogue; combine/link multiple BTS services into bundles* (e.g. a workstation requires software, a network account, email, etc.)	Class IV: Operations	3
R-TVII-58	CMMI	Provide the process improvement training (see report)	Class IV: Operations	3
R-TVII-60	CMMI	Periodically assess progress towards the process improvement goals and determine new issues, gaps, and strengths	Class IV: Operations	3

## Appendix A: List of Detailed Reports by Focus Area (Task)

Task	Document Name
II	CoP Current State Assessment - Task II (Revised 02_12_2013 v3).ppt
II	CoP - Task II Org Design Svc Del Process - Recs - 2013-12-17-Final Draft.ppt
III	City of Portland - Task III Skills and Competencies - Current State Gap Rec revised dec 23.ppt
III	Citywide IT Staff Skills and Proficiency Survey v8 Dec4.doc
IV	City of Portland - Task IV - State of Technology - 2013-12-17 Final.ppt
V	City of Portland - Task V - BTS Budget - 2013-01-10 - Revised FINAL.ppt
VI	City of Portland - Task VI Governance - Current State Framework Recommendations – Final.ppt
VI	Citywide IM-IT Governance Final.doc
VII	CMMI Gap Analysis Final Findings – Final.ppt



DRAFT ~ 2014-15 Strategic Information Technology Recommendations ~ DRAFT

Guided by Citywide Technology Assessment Independent Recommendations with Realignment Plan

Exhibit B

Work In Progress

CTO Recommendations (City of Portland Technology Initiatives)		BTS Subject Matter Experts	CoP Rec #	Independent Assessment		City Business Case (Estimates)						Proposed Solution Values		
				Consultant Sierra Systems Recommendations (Includes City/BTS 'In Process' Initiatives)	Sierra Rec #	Proposed Start	Proposed End	Cost Savings (over 5 yrs)	Cost Avoidance (over 5 yrs)	Investment (over 5 yrs)	Feasibility	Significant Cost Savings	Amount of Effort to Implement	Amount of Non- Financial Benefits
Best Practices														
Activities that have proven competitive for organizations														
(1) Col IT Governance (Communities of Interest) (IT Exec. Steering Committee)	CTO	1.1	Define Col role & responsibility of BTS & bureaus	R-TII-03	Feb 2014	On-Going	Yes	Yes	Yes	High	<div></div>	<div></div>	<div></div>	
		1.2	Design process to enable bureau efficiencies thru consolidation/collaboration	R-TV-45										
		1.3	Ensure transparency, contributions in technology priorities, Col	R-TVI-25										
		1.4	Implement Citywide change mgmt strategy; support transformation	R-TII-05										
		1.5	Implement Governance process; confirm membership & reporting	R-TVI-52										
		1.6	Address CTO authority/title to best reflect responsibilities	R-TVI-53-54										
		1.7	Build Citywide technology strategic vision & master plan	R-TII-10										
(2) BTS Organization Structure	CTO	2.1	Clarify Citywide process improvement commitment; identify sponsorship	R-TVII-55	Underway	Jul 2014	No	No	No	High	<div></div>	<div></div>	<div></div>	
		2.2	Implement new BTS Org model; Plan, Build, Run to strengthen planning efforts	R-TII-01										
		2.3	Review CoP Tech Groups (e.g., Cust. Stakeholder Grp); Assess role w/new Governance model	R-TII-04										
		2.4	Create improved Customer Relationship Mgmt Strategy (TBC)	R-TII-13										
		2.5	Establish a Process Improvement Infrastructure	R-TVII-57										
		2.6	Provide tech project report card showcasing existing projects w/potential enterprise savings	R-TII-20										
		2.7	Realign position to Police IT (\$140K/yr X5 years)	In Process										
(3) IT Skills Training	BLT Admin	3.1	Identify strategic & priority training needs to achieve citywide objectives	R-TIII-16	Jul 2014	Jun 2015	No	No	Yes	Medium	<div></div>	<div></div>	<div></div>	
		3.2	Consider Citywide technology training advisory group for BTS & bureau mgmt (Federated Model)	R-TIII-15										
		3.3	Mobilize expert resources as mentors; Xtrain-Xbureau to augment training & development	R-TIII-17										
		3.4	Evaluate training outcomes, KPIs, gaps for consistent performance, Citywide	R-TIII-18										
Shared Services Environment														
Consolidation of business operations that are used by multiple parts of the same organization														
(4) Data Center Hosting 3rd Floor Data Center (with Disaster Recovery)	Prod. Serv.	4.1	Prioritize disaster recovery; identify team and define roles & responsibilities	R-TII-08	Feb 2014	Jul 2015	Yes	Yes	Yes	High	<div></div>	<div></div>	<div></div>	
		4.2	Implement 'Cloud/As a Service' Col Task Force; pilot SME program across bureau disciplines	R-TIV-23										
		4.3	Consider applying a 'tax' against project budget approvals; X% to support Citywide DR	R-TV-43										
		4.4	Review external hosting options to support new Org structure	R-TII-09										
		4.5	Upon consolidation, find ways to complete virtualization process to fully realize savings	R-TV-47										
		4.6	Complete required business case and RFP/IGA (Intergovernmental Agreement)	In Process										
(5) BTS Business Continuity	Info Security	5.1	Prioritize BCP and DR; identify team with clearly define roles & responsibilities	R-TII-08	Underway	Jun 2015	Yes	Yes	Yes	Medium	<div></div>	<div></div>	<div></div>	
		5.2	Allow bureaus to select (reduced/tiered) service levels to offset BCP costs	R-TIV-30										
		5.3	Conduct Business Impact Analysis (\$90K Work Effort) by Fall 2014	In Process										
		5.4	Create BCP Analyst Position (1 FTE/\$137K/yr X5)	In Process										
(6) Major Systems Consolidation	CTO EBS	6.1	Create Citywide application consolidation plan; assess duplication-- consolidate for efficiency; (e.g., asset inventory management, work order, billing systems, etc)	R-TIV-21 R-TV-48	Feb 2014	Jul 2015	Yes	Yes	Yes	Medium	<div></div>	<div></div>	<div></div>	
		6.2	Conduct Business Case Study w/SAP Gap Analysis	Under Review										
		6.3	Consolidate two BTS Apps (StellarRAD-Maximus) as a first step	Under Review										
Sustainable Cost Management														
Transparency in BTS Service Catalog rates and costs														
(7) Enterprise Architecture Program	BTS Plan	7.1	Define roles & responsibilities of Enterprise Architect Program	R-TII-02	Underway	On-Going	No	Yes	Yes	Medium	<div></div>	<div></div>	<div></div>	
		7.2	Execute operational efficiencies to allow for time for arch, benchmarking & emerging technologies	R-TII-07										
		7.3	Move from Redundant City business functions toward Centers of Excellence	In Process										
		7.4	Document the City's current & future state enterprise architecture	In Process										
		7.5	Inform Bureau leadership; assist in strategic plan & investment decisions	In Process										
(8) Mainframe Enterprise Server Demobilization	Prod. Serv.	8.1	Migrate apps off mainframe; e.g., Police-ReJIN Project & Auditor's LIEN Acctng	R-TVI-32	Underway	Jul 2015	Yes	No	No	High	<div></div>	<div></div>	<div></div>	
		8.2	Complete RFP and Proceed w/favorable ROI	In Process										
(9) BTS Budget Realignment	BTS Finance	9.1	Review serv.cost model; high volume & high cost; assess consistency of methods	R-TV-37	Underway	Jul 2015	No	No	No	Medium	<div></div>	<div></div>	<div></div>	
		9.2	Improve billing comm.; identify cost control ways; clarify GF overhead charge; train bureaus	R-TIV-38										
		9.3	Clarify BTS SC (service catalogue); establish roadmap w/bureau priorities (started--ongoing)	R-TV-39										
		9.4	Restore full funding, 24X7 support; partially restore major maintenance	Realignment										
		9.5	Already consolidated 16 server platforms to 3 (pSeries)	Realignment										
(10) Citywide IT Investment/Spend (Include in Governance Above)	CTO	10.1	Define/validate total citywide technology spend; establish perf. benchmark; use GL codes	R-TV-34	Feb 2014	On-Going	No	No	Yes	Medium	<div></div>	<div></div>	<div></div>	
		10.2	Tie major expenditures to business outcomes (via Bus. Case)	R-TV-36										
		10.3	Prioritize major expenditures, Citywide (e.g., Business Continuity Plan)	R-TV-35										
		10.4	Consider options for expanding citywide Innovation Fund to fund cross-bureau initiatives	R-TV-44										
City of Portland, Executive Decision Makers					Dated: February 5, 2014						Solution Value Legend			
Mayor Hales ~ Commissioners Fish, Fritz, Novick, Saltzman											High	Medium	Low	
Executive Champion: Interim CAO Fred Miller (Office of Management and Finance)											<div></div>	<div></div>	<div></div>	
Executive Sponsor: CTO Ben Berry (Bureau of Technology Services)														
Communities of Interest (COIs) and Bureau Directors											Recommendation Ranking (Includes 48 Recommendations)			
Public Safety: BOEC, BOEM, Fire, FPD&R, PSSRP, Police											#1 Initiatives (17 of 17 Sierra)	#2 Initiatives (19 of 38 Sierra)	BTS Initiatives (12 in Process)	
Community Development: BDS, BPS, OEHR, PHB, ONI, PDC														
Utilities, Transportation, Parks: BES, PBOT, Parks, Water														
Legislative & Administrative:														
Auditor, Attorney, Budget, Council Offices, OGR, OMF (BIBS, BTS, CAO, Bus Ops, EBS, HR, Rev)														