

## Information Technology Strategy & Roadmap

Part 2: 5 Year ITSP Implementation Roadmap  
December 22, 2015



## ThirdWave

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## Section 1

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# Introduction

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### 1.1 Introduction to the ITSP Implementation Roadmap

This document provides the City of Centennial a five-year ITSP Implementation Roadmap, including phased and prioritized Information Technology initiatives. The Roadmap addresses the acquisition and implementation of Strategic Business Technologies, in addition to addressing the sustainability of the ITSP Roadmap with IT human resources.



Part 1 of the ITSP Roadmap, the Information Technology Strategic Plan Findings and Recommendations document articulates “what” should be undertaken. This document is a management tool that defines “when” ITSP Roadmap initiatives might be carried out and what investment.

As with any planning document, the ITSP Roadmap should be revisited and refreshed on a yearly basis. Updates should consider changing circumstances in a variety of areas: e.g., City organization, community demographics, emerging Information Technologies, and fluctuations in the state of the economy.

The following pages lay out a pragmatic Implementation Roadmap that will ensure the successful deployment of the IT Strategic Plan, and reflects sound investments in technologies specific to the City of Centennial, addressing the following:

- The criteria used to prioritize ITSP Roadmap Initiatives;
- Implementation Roadmap over a 5 year timeline; and,
- Resources required to sustain the ITSP implementation.

Part 2: **ITSP Implementation Roadmap**

## 1.2 ITSP Vision, Mission and Values

The following outlines the City of Centennial's ITSP Implementation Roadmap (Roadmap) vision, mission and values:

### *Vision*

Provide a comprehensive Information Technology Roadmap fostering the use of proven state-of-the-practice Information Technologies in the most strategic, innovative, cost-effective and efficient ways possible to support internal City operations, encourage business development, and provide extraordinary customer service delivery to the constituents of Centennial.

### *Mission*

Ensure IT investments and strategic business technologies are customer focused, sound, and deliver the highest possible value to the City and its constituents.

### *Values*

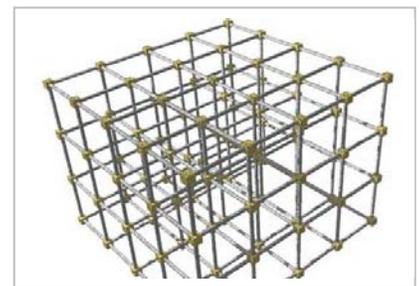
Information Technology actions are guided by values integral to everything the City's IT organization does:

- Excellence:** Lead with a clear vision, communicate, form partnerships, and take full ownership and responsibility in fulfilling our mission. Our Information technology work is relevant, timely, and delivered with superior customer service that reflects our commitment to collaboration and the highest standards of quality.
- Transparency:** Uphold a standard of municipal transparency, accountability, and reliability. We conscientiously run our IT operations to promote a City workforce that is worthy of the public trust.
- Innovation:** Constantly seek new ways to accomplish our work through efficiencies and collaboration to generate extraordinary transformative results. We are dedicated to delivering creative, innovative and forward-looking solutions.



## 1.3 ITSP Roadmap Framework

The ITSP Roadmap will foster a transformative framework for how the City leverages its Information Technologies. The City will embrace Information Technology as a strategic enabler, embedding it as a critical and fundamental component in all the City does. The City will continue to ensure the use and application of Information Technologies stays aligned with and supportive of an efficient and responsive delivery of services to all of the City's constituents – residents, businesses, and visitors.



By aligning Information Technology in support of the City’s business and service delivery processes, Centennial will become a more agile organization that is better able to support the City’s contracted business model. Moreover, the Roadmap will allow the City leverage emerging trends and evolving technologies. Through investment in Information Technology, the City will develop and implement innovative and cost effective approaches for improving the quality and delivery of needed services to its constituents.

## 1.4 ITSP Implementation Roadmap Objectives

The objectives of the ITSP Implementation Roadmap are to:

- Develop a high performance and reliable Citywide IT infrastructure to support the dynamic requirements of the City;
- Align the City’s IT initiatives with the City’s strategic plans while ensuring the City’s responsibilities and priorities are recognized and taken into account;
- Invest in IT systems based on a rational and impartial assessment of both tangible and intangible benefits, and a realistic assessment of project costs, benefits and risks;
- Reduce the cost of operations and service delivery, while improving the quality of services delivered to customers through responsible IT investment; and,
- Deliver IT services, internally to the City and externally to the residents of Centennial in a cost-effective manner.

## 1.5 ITSP Implementation Roadmap Guiding Principles

ThirdWave recommends that the City of Centennial adopt a new set of guiding principles related to the implementation of Information Technologies. Many of the following have not historically been in place due to the City’s business model and the lack limited IT staff.



ThirdWave recommends the following principles be adopted for implementing the ITSP Roadmap:

- |                          |  |
|--------------------------|--|
| <b>1. Leadership</b>     | Embrace technology as a strategic enabler and utilize IT to improve the way City staff perform their jobs and deliver services to residents and businesses.  |
| <b>2. Communications</b> | Foster effective communications between the City and constituents to keep all parties involved and informed on the progress of IT initiatives. Centennial will keep the public informed on the use of technology in the City via its website, Open Data/ Citizen Engagement and other means. |
| <b>3. IT Governance</b>  | Adopt a formal management process to ensure that IT initiatives are properly vetted for consistency with the ITSP Implementation   |

Roadmap, IT industry trends, are fiscally sound, and are effective in improving operating efficiencies and customer service prior to proceeding with IT initiatives.

- 
- 4. Enterprise Approach** Encourage an enterprise approach when procuring, implementing and managing the City's Information Technologies. The City will utilize state-of-the-practice technology ensuring investments are effectively leveraged across departments, businesses and constituents while employing economies of scale wherever possible. Information Technologies will foster cost containment and/or the highest return on investments possible.
- 
- 5. Accountability** Create an environment that encourages accountability through service level agreements, performance measures and individual responsibility, including the City contracted service providers.
- 
- 6. Proven Technology** Implement contemporary, but proven, technologies that maximize future options by emphasizing open standards. Applications should use Commercial Off-the-Shelf software wherever possible, and should be web based, wireless ready, employing a Service Oriented Architecture, and GIS enabled, where appropriate and applicable.
- 
- 7. Efficiencies** Decisions regarding funding for future technology initiatives should be based on a Business Process Improvement assessment using a formal and standard Continuous Improvement methodology, e.g., Lean, Kaizan, Rapid Workflow Process Modeling®, or other similar method. The resulting data will be used to produce a comprehensive business case that takes both tangible and intangible costs and benefits of the project into account.
- 
- 8. Strategic Investments** IT assets, systems, skills and support operations will be viewed as strategic investments that are critical in attaining internal City-wide business and external service delivery objectives.
- 
- 9. Partnerships** The City will maintain partnerships with outside Information technology firms, consultants and regional government organizations to undertake collaborative efforts in the provision of information and services, and obtain expert advice and knowledge of IT trends.
- 
- 10. Accessibility** Implement Information Technology that provides all internal and external customers easy and timely access to online information and services. The City will strive to make data available for the benefit of the public subject only to the need to protect the privacy of individuals.

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## Section 2

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# IT Strategic Plan Initiatives

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### 2.1 Technology Initiatives

The Findings and Recommendations document identified management, business process and technology solutions for enhancing the organization and service delivery environment at City of Centennial over the next five years.

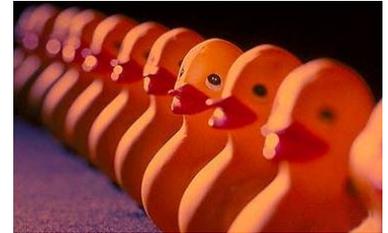
The initial list of potential ITSP Roadmap initiatives was consolidated, reduced and prioritized in this document, bringing the final number to thirty-two (32) technology initiatives. The final list of solutions relate to five Information Technology categories: infrastructure, hardware, departmental software, enterprise software, and E-Government solutions. Other solutions in the ITSP Findings & Recommendation document, not contained in this document, include operational and/or policy recommendations related to the use, operation and management of the City's IT portfolio.



IT solutions identified in the requirements definition phase of the project were vetted to produce the final list used in the prioritization process. Information Technology initiatives are described in some detail in Part One of the City of Centennial ITSP Findings & Recommendations, November 18, 2015, which will act as a reference document over the five year Roadmap.

## 2.2 Prioritization Criteria & Process

The ITSP Roadmap initiatives noted above were processed through a prioritization model, which included a range of performance parameters aligned with common municipal business objectives and tangible internal/public benefits.



This criteria was used by the City and the ThirdWave Project Team to identify a preliminary sorting of initiatives. The sequencing of initiatives was subsequently reviewed and further sorted by the City’s Project Steering Committee. A final prioritization was carried out by ThirdWave, taking into account technology prerequisites, related applications, optimum sequencing of IT initiatives and investment balancing.

The figure below describes the criteria employed to prioritize ITSP Roadmap initiatives, using a weighted rating system as described below.

**Figure 2.2.1: ITSP Roadmap Initiative Prioritization Criteria**

### Business Case Benefit Rating

- 5 High:** Provides significant benefit to internal operating efficiency/extraordinary customer service.
- 3 Medium:** Provides some benefit to internal operating efficiency/extraordinary customer service.
- 1 Low:** Provides limited benefit to internal operating efficiency/extraordinary customer service.

### Prioritization Application of Criteria

- 1. Internal or External ITSP Requirement**
  - The number of times an initiative was identified in the requirements definition phase of the project, including the Rapid Workflow® workshops, Management Interviews, Online Staff Survey, or IT Focus Groups.
  - Provides the architecture/ infrastructure required to implement other key projects;
  - Facilitates collaboration; and/or,
  - Enterprise solution, highly leverageable, benefiting the City as a whole.
- 2. Improved Staff Productivity**
  - Staff time savings;
  - Fosters internal operating efficiencies;
  - Improves organizational practices, aligning them with enterprise / departmental goals; and/or,
  - Enhances the ability to share data.
- 3. Improved Customer Services**
  - Significantly improves customer service;
  - Provides online 24x7 convenience; and/or,
  - Provides Web-enabled services for faster/easier service to the public.

**4. Cost Savings**

- Provides the potential for hard dollar savings;
- Potential deferred expenses; and/or,
- Provides cost avoidance opportunities.

**5. Revenue Generation**

- Provides the potential of increased revenues in a variety of instances where the City collects fees for services.

Figure 2.2.2 below provides a list of the final technology initiatives identified in the prioritization process, grouped into yearly phases for management consideration and budgeting.

Some of the initiatives listed below were broken out into phased deployments; therefore, the number of initiatives shown below and the actual number of initiatives in the implementation timeline differ.

**Figure 2.2.2: Prioritized ITSP Roadmap Technology Initiatives**

**Legend:**

- M Management Initiatives
- INF Infrastructure Systems
- HW Hardware
- DSW Departmental Software
- ESW Enterprise Software
- EGOV E-Government Applications

| Phase 1 | Type | Description   |
|---------|------|---|
| 1.      | M    | IT Governance   |
| 2.      | M    | Enterprise Architecture                                     |
| 3.      | HW   | Network Upgrade   |
| 4.      | ESW  | Online Building/Land Development Permitting                 |
| 5.      | ESW  | City-wide Taxonomy  |
| 6.      | ESW  | Enterprise Content Management System Phase 1                |
| 7.      | HW   | Department Scanners   |
| Phase 2 | Type | Description   |
| 8.      | ESW  | Desktop Teller  |
| 9.      | EG   | Online Maps   |
| 10.     | ESW  | Enterprise Resource Planning (Finance, Budget, Procurement, |
| 11.     | ESW  | Customer Relationship Management                            |
| 12.     | ESW  | Credit Card Processing                                      |
| 13.     | INF  | Dedicated Fiber Backbone                                    |
| 14.     | ESW  | Enterprise Content Management System Phase 2                |
| 15.     | ESW  | Contract Routing  |
| 16.     | EG   | Online Payments: Business Tax (Sales Tax)                   |

**Figure 2.2.2: Prioritized ITSP Roadmap Technology Initiatives: continued**

| Year 3 | Type | Description                       |
|--------|------|-----------------------------------|
| 17.    | ESW  | Inventory/Asset Management        |
| 18.    | DSW  | Code Enforcement                  |
| 19.    | DSW  | Online Liquor License             |
| 20.    | ESW  | Online R/W Permitting Application |

| Year 4 | Type | Description                             |
|--------|------|---|
| 21.    | DSW  | Chameleon Licenses                      |
| 22.    | ESW  | Email Management                        |
| 23.    | ESW  | Key Performance Measurement Application |
| 24.    | ESW  | Knowledge Base System                   |
| 25.    | EG   | Online Council Meetings                 |
| 26.    | INF  | Unified Communication Set               |

| Year 5 | Type  | Description                          |
|--------|-------|--------------------------------------|
| 27.    | HW    | Internal Network Security Monitoring |
| 28.    | HW    | Website Improvements                 |
| 29.    | E-Gov | Dual/Quad Band Wireless Appliances   |
| 30.    | ESW   | Update ADP System/Service Levels     |
| 31.    | DSW   | Wi-Fi Access Design (Park)           |

A description of each strategic initiative listed above is provided in the *Part 1: ITSP Findings & Recommendations* document.

## Section 3

# Budget Estimate

### 3.1 Budget Overview

The budget estimate reflects a comprehensive analysis, drawing on specific data collected in the course of the City's project. It provides a management planning budgeting tool. While every effort has been made to project the approximate cost of the proposed ITSP initiatives (i.e., gross order of magnitude estimates), **the City should be aware that technology hardware and software vendor prices vary widely, both in pricing models, product suites, bundling and maintenance options.** Moreover, the cost of implementation vendors/systems integrators can vary even more than system vendors, depending on the geographic location, size of the firm, overhead costs and business model.



The following pages provide high level budget estimates, or investment requirements, for a phased 5 year implementation of the City of Centennial's ITSP Roadmap.

It should be noted that the budget estimate represents gross level of effort estimates using the most currently available data; **it does not represent a price quote**. Furthermore, the budget estimates do not include detailed and/or total training costs, data conversion costs, and other system related costs. These costs can only be developed when the solution is known, the specific number of staff to be trained has been identified and the training approach determined, i.e., Train-the-Trainer, professional training services, internal training, etc. Similarly, data conversion costs cannot be determined until an audit of existing data (content, size, structure, data integrity, etc.) has been performed.

High level budget estimates have been determined by:

- Applying industry best practice estimating for the implementation of Information Systems;
- Past experience carrying similar IT initiatives;
- Data provided by the City, based on staff research; or
- Data researched by ThirdWave.

**All proposed solutions identified in the ITSP Roadmap should be thoroughly reviewed and go through the formal development of project requirements, specifications and preliminary work breakdown structures, resource allocation planning and development of MS Project Schedules prior to the issuance of solicitation documents or internal implementation by the City's IT organization.**

### 3.2 Information Technology Innovation Fund

ThirdWave recommends that Information Technology assume a new level of strategic importance at the City of Centennial, and that an IT Innovation Fund be established to successfully execute and sustain the implementation of the ITSP Roadmap.

The figures on the following pages provide high level investment requirements for a phased multiple year implementation of the City of Centennial's ITSP Implementation Roadmap.



**Figure 3.2.1: ITSP Roadmap 5 Year Estimated Investment**

| Year              | No. | Type | ITSP Roadmap Initiative                         | Year 1         | Year 2           | Year 3         | Year 4              | Year 5           |
|-------------------|-----|------|---|----------------|------------------|----------------|---------------------|------------------|
| <b>Phase 1</b>    |     |      |   |                |                  |                |                     |                  |
|                   | 1   | M    | IT Governance                                   | 8,000          | 0                | 0              | 0                   | 0                |
|                   | 2   | M    | Enterprise Architecture                         | 16,000         | 0                | 0              | 0                   | 0                |
|                   | 3   | HW   | Network Upgrade                                 | 34,000         | 0                | 0              | 0                   | 0                |
|                   | 4   | ESW  | Online Building/Land Development Permitting     | 350,000        | 50,000           | 50,000         | 50,000              | 50,000           |
|                   | 5   | ESW  | City-wide Taxonomy                              | 20,000         | 0                | 0              | 0                   | 0                |
|                   | 6   | ESW  | Enterprise Content Management System            | 320,000        | 25,000           | 25,000         | 25,000              | 25,000           |
|                   | 7   | HW   | Department Scanners                             | 7,600          | 0                | 0              | 0                   | 0                |
| <b>Phase 2</b>    |     |      |   |                |                  |                |                     |                  |
|                   | 8   | ESW  | Desktop Teller                                  |                | 1,500            | 375            | 375                 | 375              |
|                   | 9   | EGOV | Online Maps                                     |                | 0                | 0              | 0                   | 0                |
|                   | 10  | ESW  | ERP (Finance, Budget, Procurement, CRM)         |                | 710,000          | 75,000         | 90,000              | 90,000           |
|                   | 11  | ESW  | Customer Relationship Management                |                | 110,000          | 15,000         | 15,000              | 15,000           |
|                   | 12  | ESW  | Credit Card Processing                          |                | 60,000           | 7,500          | 7,500               | 7,500            |
|                   | 13  | INF  | Connectivity from City Office to Fiber Backbone |                | 150,000          | 0              | 0                   | 0                |
|                   | 14  | ESW  | Enterprise Content Management System Phase 2    |                | 75,000           | 0              | 0                   | 0                |
|                   | 15  | ESW  | Contract Routing                                |                | 95,000           | 13,750         | 13,750              | 13,750           |
|                   | 16  | EGOV | Online Payments: Business Tax                   |                | 155,000          | 20,000         | 20,000              | 20,000           |
| <b>Phase 3</b>    |     |      |   |                |                  |                |                     |                  |
|                   | 17  | ESW  | Inventory/Asset Management                      |                |                  | 270,000        | 37,500              | 37,500           |
|                   | 18  | DSW  | Code Enforcement                                |                |                  | 125,000        | 12,500              | 12,500           |
|                   | 19  | DSW  | Online Liquor License                           |                |                  | 135,000        | 13,750              | 13,750           |
|                   | 20  | ESW  | Online R/W Permitting Application               |                |                  | 120,000        | 20,000              | 20,000           |
| <b>Phase 4</b>    |     |      |   |                |                  |                |                     |                  |
|                   | 21  | DSW  | Chameleon Licenses                              |                |                  |                | 10,000              | 2,500            |
|                   | 22  | ESW  | Email Management                                |                |                  |                | 30,000              | 2,500            |
|                   | 23  | ESW  | Key Performance Measurement Application         |                |                  |                | 40,000              | 5,000            |
|                   | 24  | ESW  | Knowledge Base System                           |                |                  |                | 60,000              | 10,000           |
|                   | 25  | EGOV | Online Council Meetings                         |                |                  |                | 80,000              | 7,500            |
|                   | 26  | INF  | Unified Communication Set                       |                |                  |                | 135,000             | 2,500            |
| <b>Phase 5</b>    |     |      |   |                |                  |                |                     |                  |
|                   | 27  | INF  | Internal Network Security Monitoring            |                |                  |                |                     | 20,000           |
|                   | 28  | EGOV | Website Improvements                            |                |                  |                |                     | 90,000           |
|                   | 29  | INF  | Dual/Quad Band Wireless Appliances              |                |                  |                |                     | 10,000           |
|                   | 30  | ESW  | Update ADP System/Service Levels                |                |                  |                |                     | 0                |
|                   | 31  | INF  | Wi-Fi Access Design (Park)                      |                |                  |                |                     | 180,000          |
|                   |     |      |   | <b>755,600</b> | <b>1,431,500</b> | <b>856,625</b> | <b>660,375</b>      | <b>635,375</b>   |
| Contingency (10%) |     |      |   | 75,560         | 143,150          | 85,663         | 66,038              | 63,538           |
|                   |     |      |   | <b>831,160</b> | <b>1,574,650</b> | <b>942,288</b> | <b>726,413</b>      | <b>698,913</b>   |
|                   |     |      |   |                |                  |                | <b>Average/Year</b> | <b>\$954,685</b> |

**Note:**

A "0" cost indicates work carried out by City staff or no net maintenance and support costs, typically because the ITSP initiatives does not involve software purchases or related maintenance costs..

**Part 2: ITSP Implementation Roadmap**

**Implementation Assumptions:**

The footnotes below provide a synopsis of assumptions for each of the ITSP initiatives listed over the 5-year timeline. The foregoing assumes all projects deployments will be preceded by the development of formal business, functional and technical requirements, development of a comprehensive yet concise Request for Proposal document where appropriate, and will utilize competitive solicitations processes to contain costs.

**Phase 1**

1. **M** **IT Governance:** This cost reflects a task that will be carried out by City staff with minor assistance from a consultant.
2. **M** **Enterprise Architecture:** This cost reflects an initiative that will be carried out by City staff with assistance from a consultant.
3. **HW** **Network Upgrade:** This cost reflects hardware and professional services for an initiative that will be carried out by City staff with assistance from a consultant.
4. **ESW** **Online Building/Land Development Permitting:** This cost reflects an initiative that will entail software and professional services provided by a Systems Integrator, in addition to ongoing software maintenance costs.
5. **ESW** **City-wide Taxonomy:** This cost reflects an initiative that will be carried out by a consultant with the participation of City staff in all departments. It includes a document inventory, preparation of taxonomy spreadsheets for each department, and taxonomy workshops.
6. **ESW** **Enterprise Content Management System – Phase 1:** This cost reflects an initiative that will be carried out by a Systems Integrator with the participation of City staff in all departments. Phase 1 of the ECMS will include the City Clerk, City Manager, Finance and Public Works, or as determine by the City. Phase 2 will include Community Development, Economic Development, Code Compliance and Human Resources, Animal Services - or group of departments as determine by the City.
7. **HW** **Department Scanners:** This cost reflects providing scanners to four City departments implementing imaging software.

**Phase 2**

8. **ESW** **Desktop Teller:** This cost reflects an initiative that will entail City IT staff installing a copy of the existing software.
9. **EGOV** **Online Maps:** This initiative will entail City GIS staff developing online mapping applications.
10. **ESW** **ERP Finance, Budget, Procurement:** This cost reflects new servers, software/software maintenance and implementation services by a Systems Integrator with the participation of City staff. This initiative will be done in two phases in Phase 2 of the ITSP Roadmap.
11. **ESW** **Customer Relationship Management:** This cost reflects new software/software maintenance and implementation services by a Systems Integrator with the participation of City staff. This initiative will be done in two phases in Phase 2 of the ITSP Roadmap.
12. **ESW** **Credit Card Processing:** This cost reflects new servers, software/software maintenance and implementation services by a Systems Integrator with the participation of City staff.
13. **INF** **Connectivity from City Office to Fiber Backbone:** This cost reflects systems professional services, although the ratio for each was not determined here.

14. **ESW Enterprise Content Management System – Phase 2:** This cost reflects an initiative that will be carried out by a Systems Integrator with the participation of City staff. Phase 2 will include Community Development, Economic Development, Code Compliance and Human Resources, Animal Services - or group of departments as determine by the City.
15. **ESW Contract Routing:** This cost reflects systems professional services. The cost of this initiative presumes that the automated workflow engine procured as part of an ECMS system will be used.
16. **EGOV Online Payments: Business Tax:** This cost reflects software and professional development services provided by a System Integrator, as this application will need to be integrated with the City's finance system.

### Phase 3

17. **ESW Inventory/Asset/Maintenance Management:** This cost reflects a new server, software/software maintenance and implementation services by a Systems Integrator with the participation of City staff.
18. **DSW Code Enforcement:** This cost reflects software/software maintenance and implementation services by a Systems Integrator with the participation of City staff. This software will reside on the same server as the Asset Management software.
19. **DSW Online Liquor License:** This cost reflects application development/software maintenance and implementation services by a Systems Integrator with the participation of City staff. This software will reside on existing virtualized servers.
20. **ESW Online ROW Permitting Application:** This cost reflects software/software maintenance and professional implementation services.

### Phase 4

21. **DSW Chameleon Licenses:** This cost reflects software/software maintenance, implemented by City IT staff.
22. **ESW Email Management:** This cost reflects software/software maintenance, implemented by City IT staff.
23. **ESW Key Performance Measurement Application:** This cost reflects software/software maintenance, implemented by City IT staff.
24. **ESW Knowledge Base System:** This cost reflects software/software maintenance, implemented by City IT staff.
25. **EGOV Online Council Meetings:** This cost reflects software/software maintenance, implemented by City IT staff.
26. **INF Unified Communication Set:** This cost reflects systems and software/software maintenance, implemented by City IT staff.

### Phase 5

27. **INF Internal Network Security Monitoring:** This cost reflects systems and software/software maintenance, implemented by City IT staff.
28. **EGOV Website Improvements:** This cost reflects professional web application development services.

- 29 **INF** **Dual/Quad Band Wireless Appliances:** This cost reflects software/software maintenance, implemented by City IT staff.
- 30 **ESW** **Update ADP System/Service Levels:** This cost reflects software/software maintenance, implemented by City IT staff.
- 31 **INF** **Wi-Fi Access Design (Park):** This cost reflects that no system, software or professional services are required for this initiative, which will primarily be addressed by City staff and management.

The following figures provides a gross budget estimate for the necessary resources to successfully assist in the implementation of the ITSP Roadmap as well as provide the ability to sustain the City’s strategic Information technologies over time.

**Figure 3.2.2: ITSP 5 Year Sustainability Resources Investment**

| Ongoing Sustainability IT Resources                  | Year 1  | Year 2  | Year 3  | Year 4  | Year 5  |
|--|---------|---------|---------|---------|---------|
| Chief Information Officer (CIO)                      | 168,750 | 168,750 | 168,750 | 168,750 | 168,750 |
| Application Support Administrator III (Senior Level) | 94,500  | 94,500  | 94,500  | 94,500  | 94,500  |
| Database Administrator (Senior Level)                | 126,900 | 126,900 | 126,900 | 126,900 | 126,900 |
| Business Analyst (Senior Level)                      | -       | 126,900 | 126,900 | 126,900 | 126,900 |
|  | 390,150 | 517,050 | 517,050 | 517,050 | 517,050 |

**Notes: The following resources will be in addition to current staff and contracted services.**

**Chief Information Officer (CIO):** This is the highest level IT position in an organization. The CIO directs a large staff of supervisory, professional and support personnel. Provides technology vision and leadership to the organization by developing and implementing communications and information technology (IT) initiatives and plans that improve the organizations effectiveness. The CIO provides strategic and tactical planning, development, evaluation, and coordination of the communications and information technology systems. Establishes budgetary and performance controls and serves as a part of the top management strategic planning team. Requires a BA/BS with an advanced degree (Masters) preferred with a minimum of 8 years managing an IT organization.

**Application Support Administrator III (Senior Level):** Supports "off the shelf" software including installing, configuring, testing, monitoring and troubleshooting. Responsible for the application security process, user setup, role privilege definition, assignment and security permissions and overseeing the installation and/or upgrade of software package releases. Typically requires more than 5 years experience.

**Database Administrator (Senior Level):** Specific skills and tools in this category: Oracle, MS SQL, MYSQL, Postgres, DB2, Ingres, Oracle Spatial, ESRI-SDE, database management and monitoring tools. Fully responsible for installation of the database software, position requires little or no supervision, new releases and upgrades, and supporting products. Creates and manages multiple databases, tablespaces and indexes. Maintains databases up to current security standards. May direct the lower-classified positions within database administration in more advanced database management procedures and diagnostics. Monitors, tunes, diagnoses, resolves problems with the databases and their performance. Develops and maintains a backup and recovery strategy for all databases. Establishes standards and procedures. Typically requires a BA/BS or equivalent, database management certification preferred and a minimum of 6 years experience with administering relational database technology.

**Business Analyst (Senior Level):** Performs more complex business process analysis to determine potential needs and works with internal customers to identify changes or improvements to the functionality and efficiency of these processes. Documents business requirements and creates flowcharts. Recommends information technology solutions to meet business needs and coordinates the planning, development, and implementation of these solutions. May train and guide the work of less experienced Business Analysts. Typically requires a BA/BS or equivalent and 6 or more years of experience analyzing and evaluating business processes. (The Business Analyst is a resource whose responsibilities might be carried out by a management analyst with some experience and expertise with Information technology.)

The figure below provides a gross estimate for temporary backfill finance resources during the implementation of the Enterprise Resource Planning (ERP) system, which will be carried out in two phase over year 2 and 3.

**Figure 3.2.3: ITSP 5 Year Backfill Resources Investment**

| Enterprise Resource Planning Backfill Resources | Year 1 | Year 2  | Year 3  | Year 4 | Year 5 |
|---|--------|---------|---------|--------|--------|
| Finance Accountant                              | -      | 85,547  | 85,547  | -      | -      |
| Finance Accountant                              | -      | 85,547  | 85,547  | -      | -      |
|   | 0      | 171,094 | 171,094 | 0      | 0      |

The figure below provides a total investment summary including ITSP technology initiatives, IT sustainability resources, and finance backfill staff during the implementation of enterprise finance solutions. The summary represents a gross level of magnitude investment that will take the City of Centennial to the next level in its evolution as an innovative, high performing City.

**Figure 3.2.4: Total ITSP Investment Summary**

| Total Investment                     | Year 1             | Year 2             | Year 3             | Year 4              | Year 5             |
|--------------------------------------|--------------------|--------------------|--------------------|---------------------|--------------------|
| IT Strategic Plan Roadmap Investment | 831,160            | 1,574,650          | 942,288            | 726,413             | 698,913            |
| Sustainability IT Resources          | 390,150            | 517,050            | 517,050            | 517,050             | 517,050            |
| ERP Backfill Positions               | 0                  | 171,094            | 171,094            | 0                   | 0                  |
| <b>Total 5-Year Investment</b>       | <b>\$1,221,310</b> | <b>\$2,262,794</b> | <b>\$1,630,432</b> | <b>\$1,243,463</b>  | <b>\$1,215,963</b> |
|                                      |                    |                    |                    | <b>5 Year Total</b> | <b>\$7,573,961</b> |
|                                      |                    |                    |                    | <b>Average/Year</b> | <b>\$1,514,792</b> |

## Section 4

# 5 Year IT Strategic Plan Implementation Roadmap

### 4.1 ITSP Roadmap Implementation Principles

The ITSP Roadmap illustrates the prioritized sequencing and projected timelines for strategic initiatives over a 5-year period. The Roadmap represents the logical and well planned construction phase of the IT Strategic Plan.

The following pages provide yearly project schedules reflecting the final prioritized IT Initiatives identified in the ITSP Roadmap Project *as of this writing*. However, it bears noting that this Roadmap is a living document. **As a planning and implementation document, this document is subject to continuous review and adjustment as the City's organization needs, financial position, technologies emerge, and the City's Information Technology portfolio changes.**



#### 4.1.1 Technology Implementation Principles

The ITSP Implementation Roadmap adheres to a framework comprised of a number of general operating principles, as outlined below:

- 1. Build a solid and secure infrastructure foundation:** The ITSP Roadmap assumes that the City's network and communications infrastructure is sound and secure, allowing for the deployment of various strategic technologies. This is a prerequisite to the deployment of departmental and enterprise applications.

2. **Focus on economies of scale in the investment and deployment of initiatives:** For instance, the implementation of an Online Building/Land Development Permitting system will meet the needs *for several departments*; the E-Government applications can assume a “write-once use many” approach where an Online Payments application can be used to address several online payment requirements across numerous departments and applications.
3. **Provide staff with sufficient tools of the trade:** The ITSP Roadmap focuses on providing staff with the fundamental tools needed to provide City services **and** interface with all of the City’s constituents, i.e., contemporary departmental and enterprise application software, mobile devices, and web-enabled service delivery solutions.
4. **Recognize deployment prerequisites:** The ITSP Roadmap recognizes that deployment of certain solutions require up-stream system preparation, i.e., upgrading the City’s network, ubiquitous remote access to data for City staff working in the field, and so on. In some cases, this may require the City to acquire enabling hardware and/or software technologies either in-house or through “cloud-based” service providers.
5. **Utilize parallel deployment approaches to fast track initiatives:** To the extent possible, based on available resources, some ITSP Roadmap initiatives will occur in parallel using appropriate IT resources and/or service providing firms to execute IT projects and initiatives. However, multiple enterprise systems should not be deployed at the same time as that might unnecessarily tax the workload of existing City staff.
6. **Use IT best practices for the execution and management of ITSP Roadmap initiatives:** All development and implementation projects will use formal industry standard PMBOK® (the Project Management Institute’s *Project Management Body of Knowledge*) Project Management methodology and a uniform Enterprise Architecture, Structured Development Life Cycle (SDLC) methods, development tools and databases.
7. **Allocate sufficient IT resources to ensure sustainability:** The ITSP Roadmap currently includes ITSP initiatives of varying scale and complexity over the next several years. This represents a significant workload for the IT organization. The implementation will require that the City place a high level of importance on IT staff resource allocation (City staff, contractors and/or consultants) to successfully deploy and effectively sustain the IT Strategic Plan.

## 4.2 5 Year Implementation Timeline

The figure on the following page (4.2.1) provides an overview of the proposed 5 year Implementation Roadmap. In general, the 5-year plan follows the prioritization identified in Section 2 of this document. The following should be noted:

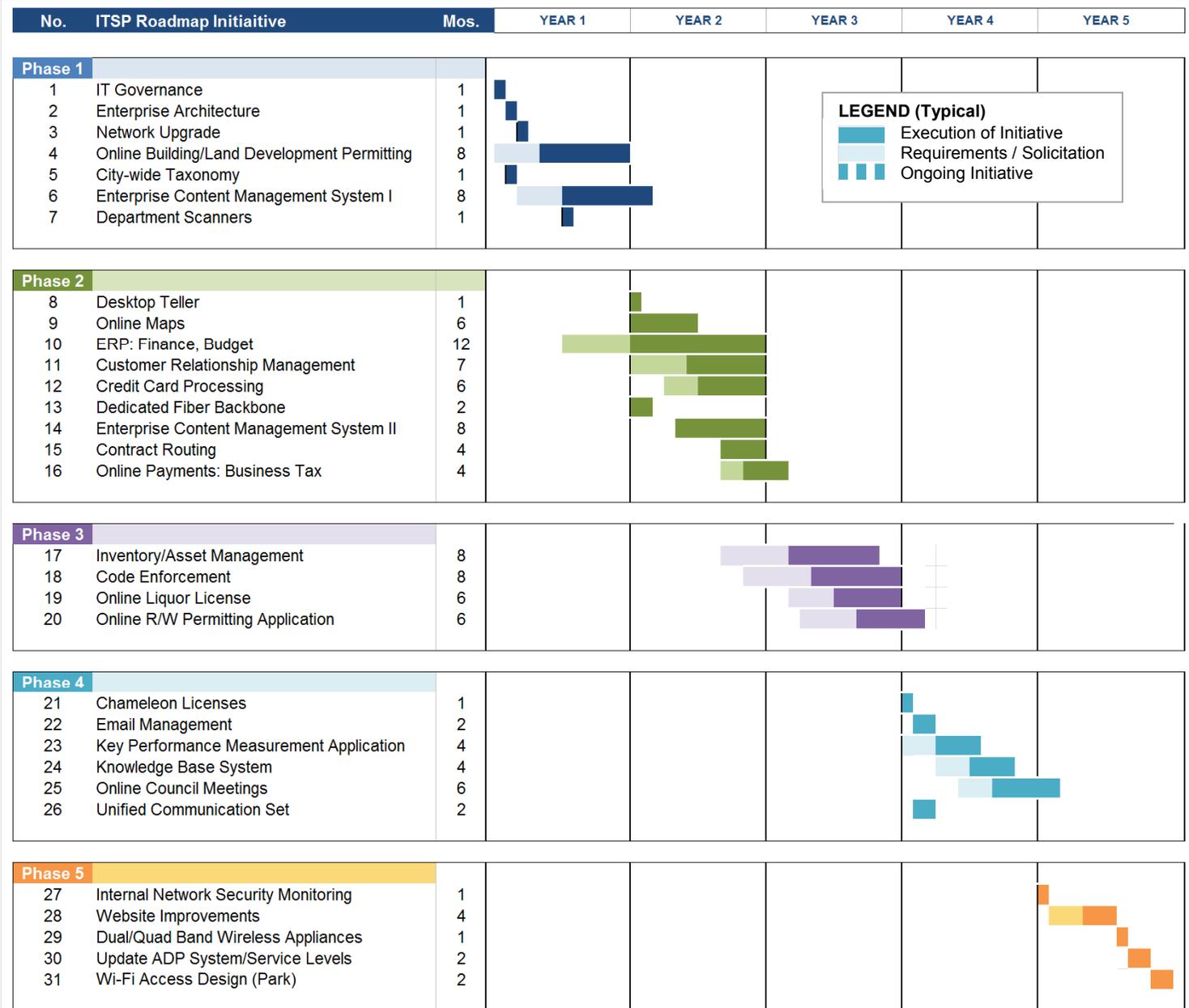
- Projects anticipated to be carried out by existing IT resources without a solicitation phase are shown with a solid bar indicating approximate deployment timelines. (The solid bar indicates the projected implementation timelines, not the upfront requirements definition and solicitation timelines.)
- **Projects requiring requirements definition and/or a solicitation process are shown with a light colored bar preceding the solid dark color bar**, which indicates the deployment timelines. ITSP Roadmap initiatives that require a solicitation process tend to be the larger and more complex projects. These projects will generally be carried out by external professional resources supported by internal City IT staff/subject matter experts.



From a planning perspective, the solicitation timelines are important because they imply:

- A formal requirements definition effort;
  - The formation staff resources for the development of RFP documents;
  - The formation of end user evaluation / selection committees;
  - The assignment of appropriate IT staff resources for the execution of the initiatives;
  - The assignment of appropriate City staff backfill resources for the execution of large IT projects, i.e., Enterprise Resource Planning solutions; and
  - The identification of appropriate Change Management activities.
- Ongoing ITSP Roadmap initiatives are shown with a dashed line.
  - The number in the column titled “MO” indicates the approximate number of months estimated to carry out an initiative.
  - The abbreviation “OG” denotes an On Going task, as in the ongoing process up updating PCs.
  - **The timing of ITSP Roadmap initiatives are subject to change based on the availability of funding**, either at the department or enterprise level.
  - **The ITSP Roadmap proposed here is not cast in concrete** and should be reviewed on a yearly basis and revised as appropriate.

**Figure 4.2.1: Overall 5-Year Implementation Roadmap**



**Note:**

The numbers shown in the “Mos.” column indicate the number of months for the implementation of an ITSP initiative, shown with the dark colored bar. It does not include the front-end work to develop requirements or carry out a solicitation.

**Implementation Assumptions:**

The footnotes on the following page provide a synopsis on the implementation approach for each of the ITSP initiatives listed over the 5-year timeline. The number inside the parenthesis indicates the estimated implementation timeline in months. The foregoing assumes all project deployments will use formal PMBOK™ Project Management and Change Management Best practices.

**Phase 1**

1. **IT Governance (1):** This initiative would be carried out by City staff and could begin immediately.
2. **Enterprise Architecture (1):** This initiative assumes it would be carried out by City staff with some assistance from a consultant.
3. **Network Upgrade (1):** This initiative would be carried out by City staff and could begin immediately.
4. **Online Building/Land Dev. Permitting (6):** This initiative assumes detailed technical and functional requirement would be developed and incorporated into an RFP (as denoted by the light bar); a four month process followed by the deployment.
5. **City-wide Taxonomy (1):** This initiative assumes it would be carried out by City staff with some assistance from a consultant. This project does not assume a formal procurement process.
6. **Enterprise Content Management System I (8):** This first phase of the ECMS deployment assumes detailed technical and functional requirement would be developed and incorporated into an RFP (as denoted by the light bar); a 4 month process followed by the deployment. Much of these requirements are contained in the ITSP Findings & Recommendations document.
7. **Department Scanners (1):** This initiative would be carried out by City staff as part of the ECMS deployment.

**Phase 2**

8. **Desktop Teller (1):** This initiative would be carried out by City IT staff and could begin immediately.
9. **Online Maps (6):** This initiative would be carried out by City GIS/IT staff and could begin immediately. This is part of ongoing work this groups already performs.
10. **ERP I: Finance, Budget (9):** This initiative assumes a 6-month timeline to: develop to-be business process maps (building on the Rapid Workflow® process maps), a detailed technical and functional requirements, RFP and go through a formal procurement process followed by the deployment. The deployment timeline assumes 2 backfilled positions for the duration of the deployment phase.
11. **ERP II: Customer Relationship Management (6):** This initiative assumes a 3-month timeline to: develop to-be business process maps (building on the Rapid Workflow® process maps), a detailed technical and functional requirements, RFP and go through a formal procurement process followed by the deployment. The deployment timeline assumes SME staff will be involved but no backfilled positions will be required.
12. **Credit Card Processing (6):** This initiative assumes a 3-month timeline to: develop detailed technical and functional requirements, RFP and go through a formal procurement process followed by the deployment.
13. **Dedicated Fiber Backbone (2):** This initiative assumes a 2-month timeline to: develop detailed technical and functional requirements and have City IT/Greystone carry out the deployment.

14. **Enterprise Content Management System II (6):** This second phase of the ECMS deployment assumes detailed technical and functional requirements would be developed (as denoted by the light bar); a 4 month process followed by the deployment. Much of these requirements are contained in the ITSP Findings & Recommendations document. This work will be carried out by the City's IT Staff.
15. **Contract Routing (4):** This initiative assumes a 3-month timeline to: develop detailed technical and functional requirements and the application using the Automated Workflow engine procured as part of the ECMS.
16. **Online Payments: Business Tax (4):** This initiative assumes a 2-month timeline to: develop detailed technical and functional requirements, issue an RFP and go through a formal procurement process followed by the deployment.

### Phase 3

17. **Inventory/Asset Management (6):** This initiative assumes a 4-month timeline to: develop to-be business process maps (building on the Rapid Workflow<sup>®</sup> process maps), detailed technical and functional requirements, RFP and go through a formal procurement process followed by a 6 month deployment.
18. **Code Enforcement (4):** This initiative assumes a 4-month timeline to: develop to-be business process maps (building on the Rapid Workflow<sup>®</sup> process maps), detailed technical and functional requirements, RFP and go through a formal procurement process followed by a 6 month deployment. The Inventory/Asset Management and Code Enforcement solutions could be contained in one RFP/solicitation process.
19. **Online Liquor License (4):** This initiative assumes a 3-month timeline to: develop detailed technical and functional requirements, issue an RFP and go through a formal procurement process followed by a 4 month web-application deployment.
20. **Online R/W Permitting Application (4):** This initiative assumes a 3-month timeline to: develop detailed technical and functional requirements, issue an RFP and go through a formal procurement process followed by a 4 month web-application deployment.

### Phase 4

21. **Chameleon Licenses (1):** This initiative would be carried out by City IT staff.
22. **Email Management (2):** This initiative would be carried out by City IT staff possibly deploying a module of the ECMS.
23. **Key Performance Measurement Application (4):** This initiative assumes a 3-month timeline to: develop detailed technical and functional requirements, issue an RFP and go through a formal procurement process followed by a 4 month web-application deployment.
24. **Knowledge Base System (4):** This initiative assumes a 3-month timeline to: develop detailed technical and functional requirements, issue an RFP and go through a formal procurement process followed by a 4 month web-application deployment.
25. **Online Council Meetings (4):** This initiative assumes a 3-month timeline to: develop detailed technical and functional requirements, issue an RFP and go through a formal procurement process followed by a 4 month web-application deployment.
26. **Unified Communication Set (2):** This initiative would be carried out by City IT staff.

**Phase 5**

27. **Internal Network Security Monitoring (1):** This initiative would be carried out by City IT staff.
28. **Website Improvements (3):** This initiative assumes a 3-month timeline to: develop detailed technical and functional requirements, issue an RFP and go through a formal procurement process followed by a 3 month web E-commerce development.
29. **Dual/Quad Band Wireless Appliances (1):** This initiative would be carried out by City IT staff.
30. **Update ADP System/Service Levels (2):** This initiative would be carried out by City IT staff, and assumes that the existing ADP system will be continued. Another option is to replace the existing payroll system with a commercial off-the-shelf solution. In that event, the timeline would be significantly longer, requiring formal requirements definition and solicitation process.
31. **Wi-Fi Access Design (Park) (2):** This initiative would be carried out by City IT staff.

## Section 5

# City & Constituent Benefits

### 5.1 Sorted ITSP Roadmap Benefits

A number of quantitative and qualitative benefits were identified in the ITSP Roadmap project indicating considerable opportunity for enhancing internal operations and service delivery to the public. Qualitative business process improvement and service delivery benefits were split equally across external (customer focused) and internal benefits. And while the benefits were not quantified (i.e., there is no measure of the magnitude of benefits in terms of dollars) the list below provides a general indicator of the opportunity.



The figure on the following page provides a compiled list of potential ITSP Roadmap benefits identified by City staff and management if the initiatives identified in the project were implemented. This list indicates that the most substantial benefits of implementing an enterprise driven ITSP Roadmap are the outcomes all municipalities strive for.

The top 10 potential benefits identified include:

**1. Staff time savings (123)**

According to City staff, management and ThirdWave's findings, funding the ITSP Roadmap will allow for better use of staff time and time-savings, by far the most significant benefit allowing the City to sustain its organizational business model by not increasing its staffing levels. The implementation of the ITSP Roadmap will allow existing City staff to better meet the growing service demands of the City's constituents.

**2. Improved efficiency (60)**

Execution of the ITSP Roadmap will further the efficient use of staff time, in terms of executing common work tasks, looking for information, not re-keying data into redundant systems, and/or looking for (and gathering) information from numerous disparate systems. The implementation of an online building and land development permitting system with online payments will streamline business processes and make. The implementation of a contemporary Enterprise Content Management System will make information accessible internally to City staff and the external customer – on a self-service model. Execution of the ITSP Roadmap will improve staff productivity by fostering a workplace where more can be done with fewer or existing resources

**3. Improved customer service (53)**

Execution of the ITSP Roadmap will improve the levels of customer service, internally amongst City staff and externally to constituents. In both cases, systematizing data / information and transactions replaces the need to physically go to the City and/or manage City operations and services with hardcopy documents. Web-enabled applications will allow the public 24x7x365 convenience. Even though City staff appreciates providing face-to-face services, the use of online applications and E-Forms will allow the public self-services options which are increasingly the norm with progressive E-Government agencies.

**4. Business Process Improvement (48)**

The adoption and funding of the ITSP Roadmap will provide significant opportunity to streamline the execution of City Department work activities in many areas. This will result in improved internal operations and enhanced service delivery to City customers.

**5. Improved consistency and accuracy (43)**

Implementing the ITSP Roadmap will significantly improve the ability of City staff to produce and store more consistent and accurate information. This benefit applies to the majority of City departments including better financial data, improved access to data to public works crews in the field, and more accurate reports across all departments. For the public, the ITSP Roadmap will facilitate an Open Government policy and enhanced transparency.

**6. Reduced errors (40)**

Implementing the ITSP Roadmap will significantly improve the ability of City staff to process data in how it provides services by reducing errors. The most common instances where errors occur are in processing hardcopy forms and duplicate data entry, where the same or similar data is re-keyed into more than one application.

**7. Reduced staff stress (38)**

Implementing the ITSP Roadmap will reduce and mitigate a number of workplace/ business process situations where City staff is experiencing considerable frustration. The use of automation will streamline many business processes which currently rely on manual methods. This would enhance service delivery and decrease stress.

**8. Cost savings (36)**

Implementing the ITSP Roadmap will reduce the City's operating costs in several areas by reducing: the amount of hardcopy documents, duplicate staff work, wasted staff time, the cost of driving back and forth to City facilities by field staff, etc.. City constituents will also see cost savings by accessing City information and services on-line, without having to drive to City Hall receive services or gather information.

**9. Quicker access to information (31)**

Implementing the ITSP Roadmap will provide quicker and easier access to many types of information for City staff and constituents. Most, if not all, of the proposed information systems provide interoperability (the ability to share data across systems) or web-enabled access to information from anywhere at any time from any device. The implementation of an Enterprise Content Management Systems offer the ability to offer access to City documents/records to City staff and the public.

**10. Increased ease of use doing business with the City/better customer experience (24)**

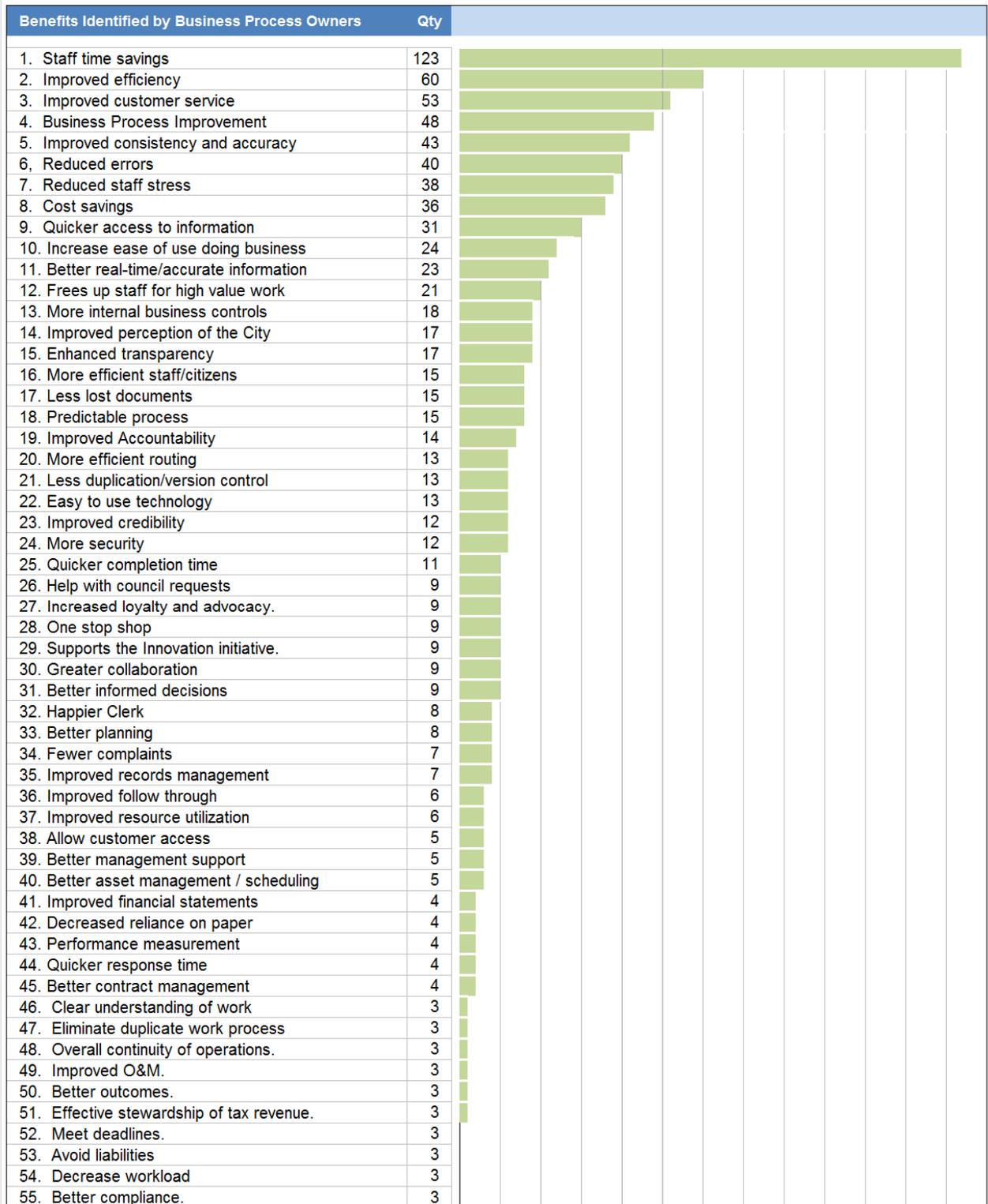
Implementing the ITSP Roadmap will make a significant difference in enhancing the customer experience of constituents – and fostering a business friendly environment. For instance, in Public Works Operations, the public will see the status of their requests online; persons applying for a liquor licenses and permits will be able to submit, pay, and check the status of the application in the process. And the new Enterprise Content Management System will provide self-serve access to City documents/records anytime from anywhere; for Public Records requests the a new Customer Relationship Management solution will facilitate Citizen and Council requests.

The top 10 benefits identified above, and the remaining quantitative and qualitative benefits provide a compelling business case for approving and funding the City of Centennial's ITSP Roadmap.

The Gant chart on the following page provides a graphical representation of fifty-five (55) potential benefits out of a total of 221 (two-hundred and twenty-one) types of potential benefits identified in the ITSP project. (Nine-hundred and seventy-six (976) specific potential benefits were identified in twenty-five (25) business process workshops, an average of thirty-nine (39) benefits per mission critical business process.)

While these benefits are not quantified, they do illustrate the level of magnitude of the benefit of investing in the City's future as innovative user of Information technologies.

**Figure 5.1.1: Summary of Potential Benefits Across All City Departments**



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## Section 6

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# Closing Recommendation

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### 6.1 Adoption & Funding

Based on the voluminous amount of data collected from City staff and management, the findings and recommendations of the ITSP Roadmap project, and the opportunities for making substantial progress in the use of emerging Information Technologies, ThirdWave recommends that the City of Centennial Information Technology Strategic Plan and Implementation Roadmap be approved and adopted by the City.

Moreover, we recommend that year 1 be funded.

Doing so will result in business process improvement, increased operational efficiencies, and enhanced service delivery to constituents while containing operational costs.

Adoption of the ITSP represents **a timely quantum leap into the future in the evolution and reinvention of an extraordinary City steeped in a 15-year tradition of bold vision and entrepreneurial spirit:** The Roadmap will strategically position the City of Centennial for the next 15 years.

