The City of Cupertino

2017 Information Technology Strategic Plan Update

Prepared by:

NEXLEVEL Information Technology, Inc.

Final Report
October 31, 2017

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Table of Contents

This Information Technology Strategic Plan was prepared for the City of Cupertino by NexLevel Information Technology, Inc.

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Section 1 - Introduction

"The Mission of the City of Cupertino is to provide exceptional service, encourage all members of the community to take responsibility for one another, and support the values of education, innovation and collaboration." – City of Cupertino

1.1 - Scope and Objectives

"The secret of success is not predicting the future; it is creating an organization that will thrive in a future that cannot be predicted." – Michael Hammer, author and noted authority on Business Process Re-Engineering

This document, entitled 2017 Information Technology Strategic Plan Update, was prepared for the City of Cupertino (City) by NexLevel Information Technology, Inc. (NexLevel). The purpose of the document is to provide an update to the Information Technology Strategic Plan (ITSP) prepared for the City in 2015 to reflect changes in direction, priorities, and projects including the progress made by the City in the implementation of the recommendations provided in 2015.

The update was developed in a highly collaborative manner that included a series of interviews with key stakeholders from City departments and offices to review the projects identified in 2015 as well as a workshop in which the stakeholders worked together to review the projects and to establish a project timeline based on the City's overall priorities and the available resources over the next three fiscal years.

The update also includes a review of a number of high-priority information technology infrastructure projects which will provide the foundation for the timely and successful completion of the proposed projects as well as ensure that the City will be able to sustain the delivery of information technology services.

The IT Strategic Plan will enable the City to better allocate its information technology resources and to obtain greater benefits for its investments in information technology. The plan does not attempt to predict the future; but rather, in conjunction with the establishment of a more thorough process for the governance of the City-wide use of information technology, provides both a process and a baseline to enable the City to more effectively respond to new and/or changing requirements by proactively adapting processes, organization, people, and infrastructure.

1.2 - Document Contents and Organization

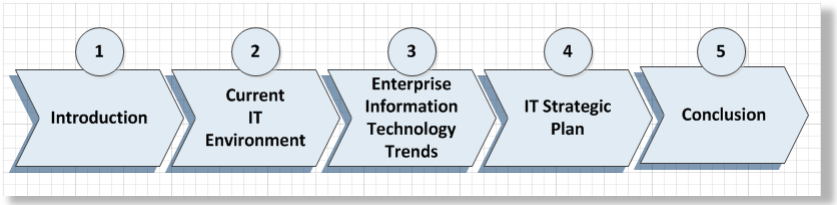

Figure 1 – Document Organization

As depicted in Figure 1, Document Organization, the document contains the following sections:

- *Section 1, Introduction* – (this section) provides information regarding the scope and objectives of the planning effort, the organization of the document, background information, the methodology used to develop the IT Strategic Plan, and an Executive Summary

- *Section 2, Current IT Environment* – provides a summary of the findings and recommendations provided in the 2015 IT Assessment Report, including an overview of the City's conformance to IT best practices and the resulting recommendations and the City's current status
- *Section 3, Enterprise Information Technology Trends* – provides a discussion of the most significant changes in information technology that will likely impact the City over the duration of the IT Strategic Plan
- *Section 4, IT Strategic Plan Update* – provides information regarding the open and collaborative process that was used to develop the update to the strategic plan, including the steps in its development and refinement and the resulting project roadmap and resource requirements
- *Section 5, Conclusion* – provides thoughts and observations for the City's consideration based on NexLevel's experience in developing IT Strategic Plans for local governments and special districts in the State of California

The document also includes an Appendix.

Terminology

Please note that in order to avoid confusion, references to the City's Innovation and Technology Department will either be spelled out or use the acronym "ITD." References to information technology, in general, will either be spelled out or use the acronym "IT."

1.3 - Strategic Planning Methodology

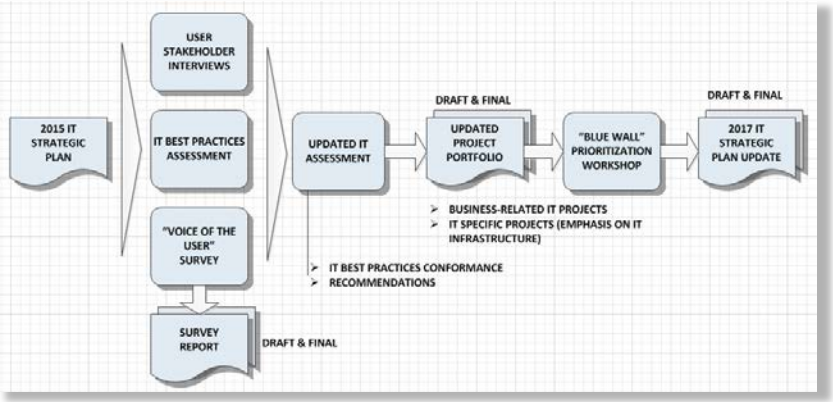

Figure 2 – Methodology for ITSP Update

Figure 2, Methodology for ITSP Update, depicts the steps in the project and the key deliverables that were produced. The scope of the project included:

- Conducting a new user survey to determine whether there had been changes in user satisfaction as compared to the 2015 user survey
- Reviewing the City's current conformance to IT best practices as compared to 2015 and reviewing the City's proposed information technology infrastructure projects
- Conducting user interviews to identify whether there were any changes to the strategic user projects identified in 2015 including updating any changes to status, scope, and objectives, deleting projects that were no longer considered to be priorities, and adding new projects identified by the user stakeholders. As a result of this activity, an updated project portfolio was developed and distributed to the users for their review

- Conducting a prioritization workshop (the "Blue Wall" workshop) to review the projects and to establish a timeline for the completion of the projects over the next three fiscal years (i.e., FY 2017/18, 2018/19, and 2019/2020). This document was then developed to document the decisions and information developed in the course of the ITSP update

1.4 - Background Information

NexLevel was engaged by the City of Cupertino in 2015 to develop an Information Technology Strategic Plan beginning in March of 2015, that included a survey of user satisfaction with the City's IT services, an information technology assessment, the development of a five-year IT strategic plan, and a governance working session for the City's newly formed Business Technology Steering Committee including a draft charter for the committee.

In the course of conducting the "Voice of the User" Survey and the IT Assessment in 2015 it became apparent that there was significant dissatisfaction with the ability of the (then) Information Technology Division to support the City's needs and to effectively deliver IT services. The IT Assessment included a number of strategic and tactical findings for the City including:

- The City did not have an effective framework for City-wide information technology planning, funding, and governance
- The City did not have a well-articulated enterprise architecture to support its implementation of New World's Logos (now Tyler) ERP application
- The Information Technology Division was struggling to provide a consistent and acceptable level of support to the user community for infrastructure, desktops, and networking. These struggles were related to the absence of effective and experienced leadership, insufficient IT staffing, and a reactive approach to supporting the City's user communities
- The City's information technology infrastructure was dated, largely undocumented, and ill-prepared for contingencies such as power failures

Following the issuance of the 2015 Information Technology Assessment Report and the delivery of the draft 2015 Information Technology Strategic Plan, the City moved to bring in effective and experience leadership for ITD. In the course of this effort, the Information Technology Division was reorganized as the Information Technology Department and the newly selected Chief Information Officer took immediate steps to resolve the issues with staffing and the City's information technology infrastructure and, with these in hand, worked with the City's management team to resume the information technology planning effort which resulted in the development of this update.

1.5 - Executive Summary

> **"Innovation is less about generating brand-new ideas and more about knocking down barriers to making those ideas a reality."**- Eight Steps to Accelerate Change in 2015, John Kotter

This section of the report provides a high level summary of the 2017 IT Strategic Plan Update. Overall, the City of Cupertino has made substantial progress since 2015; the challenge now becomes to solidify that progress to enable the City to sustain IT service delivery levels while carrying out projects to improve support for business operations through enhancement and renovation of the City's core business applications.

The 2017 IT Strategic Plan Update supported this effort by providing:

- A benchmark of where the City is today with regard to user satisfaction with IT services, conformance to IT Best Practices, and the completion of initiatives identified in the course of the 2015 planning effort
- A revised assessment of the City's information technology objectives based on the benchmarking efforts and new user and information technology projects and priorities that were identified through interviews with key user and IT stakeholders
- A plan for the implementation of these projects through FY 2019/20

Summary of Changes in User Satisfaction

User satisfaction was assessed in both quantitative terms (through an anonymous user survey) and subjectively through interviews with key stakeholders in the City's user community. Both the survey and the interviews indicated that user satisfaction with the City's IT services had increased, in some cases substantially so, from 2015 to 2017.

Looking at each in turn, the results of the user survey revealed that:

- The respondents' satisfaction with ITD's understanding of the City's business objectives and with ITD's planning of technology projects increased 20% or more from 2015
- The respondent's satisfaction in other key areas, including ITD's management of information technology projects, understanding of the technology that departments use, ability to access information from City and external sources in a timely manner, network availability and communication on the status of problems or requests, increased between 10% and 15% from 2015
- Respondent satisfaction even increased, although marginally, in those areas where ITD did well in 2015

The results of the user interviews were generally consistent with the survey results. With additional resources and more experienced leadership ITD, has been able to:

- Stabilize and renovate components of the City's information technology infrastructure, which has improved performance and availability
- Devote greater attention to user requests for service and problem reports and resolve them sooner than in 2015
- Provide assistance to users with regard to the selection, implementation, and maintenance of business applications, this includes providing leadership and support for a major upgrade to Laserfiche, the implementation of Accela, and

the planning of improvement for business license processing

Summary of Changes in IT Best Practices Conformance

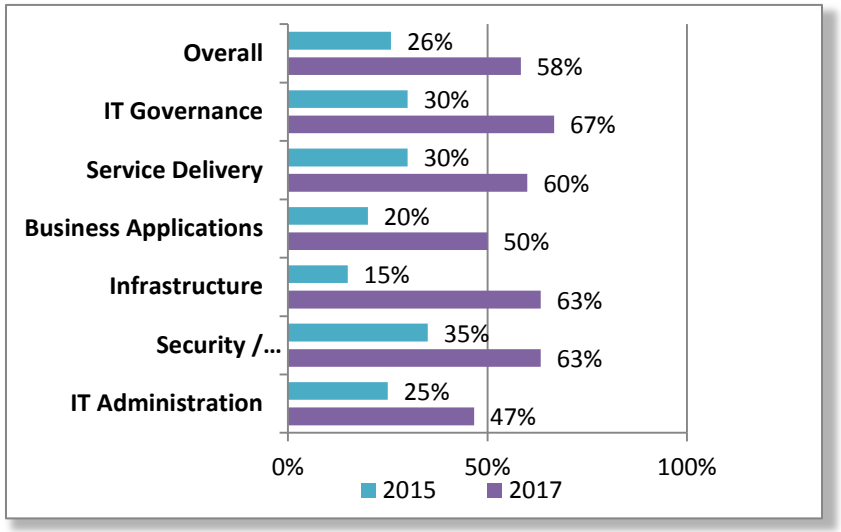

Chart 1 – Comparison of IT Best Practices Conformance, 2015 and 2017

Chart 1, Comparison of IT Best Practices Conformance, 2015 and 2017, depicts the increase in conformance to the IT best practices in each of the dimensions of the model. Gains of 25% of more were noted in regard to overall conformance, IT Governance, Service Delivery, and Business Applications. The change in overall conformance from 26% to 56% is indicative of the City moving the lower band of the Reactive Level in NexLevel's maturity model to the lower band of the Proactive Level and the City receiving greater benefits for its investments in information technology.

Summary of IT Strategic Plan Update

NexLevel initially facilitated a prioritization workshop for the City on Tuesday, September 15, 2015, with the objectives of:

- Reviewing the projects identified in the course of information technology assessment, with the emphasis being placed on high-priority projects that needed to be completed by the end of FY 2016/17 (approximately twenty-one months). These "tactical" projects will provide the foundation for the completion of the remaining projects. These "proposed projects" were placed in a pool of projects that the City will periodically review and undertake as resources become available
- Adding, changing, or deleting projects as needed
- Developing the initial project roadmap which was then refined by NexLevel

Through this effort, thirty-nine projects were reviewed and prioritized by the participants including:

- Six projects that were in-progress including projects that were to be completed during FY 2015/16 and projects whose completion would extend into FY 2016/17
- Eight projects that were expected to be initiated in FY 2016/17
- A pool of 25 projects that the City would consider as resources became available

In the course of preparing this update to the 2015 IT Strategic Plan, NexLevel met with the City's Chief Technology Officer and the managers and staff of ITD as well as key user stakeholders to review the portfolio of projects developed to support the 2015 IT Strategic Plan with the objective of identifying projects that had been

completed, projects that were still needed, new projects, and projects that were no longer required with particular focus on projects related to the renovation of the City's information technology infrastructure through FY 2019/20.

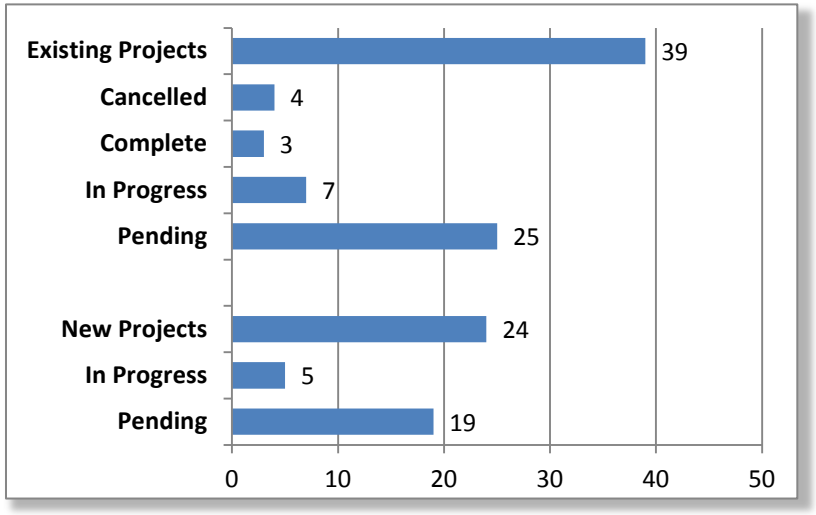

Chart 2 – Status of Existing and New Projects

Chart 2, Status of Existing and New Projects, depicts the results of the project review. Of the thirty-nine projects from the 2015 Prioritization Workshop, four were cancelled, and seven were in reported to be in progress. More noteworthy is that the participants in the project review identified twenty-four new projects (five of which were already in progress) including major initiatives to:

- Improve staff effectiveness by upgrading document and content management capabilities, including the implementation of automated workflows
- Improve permitting through the implementation of Accela for land management
- Improve asset management through the implementation of enhancements for Cityworks and integrating it with the City's GIS system
- Obtain greater value from the New World ERP suite by implementing additional functionality for finance, accounting, and HR
- Obtain greater reliability and performance from the City's information technology infrastructure through the continuing implementation of hyperconvergence, improvement of physical facilities, and refreshment of over-aged devices

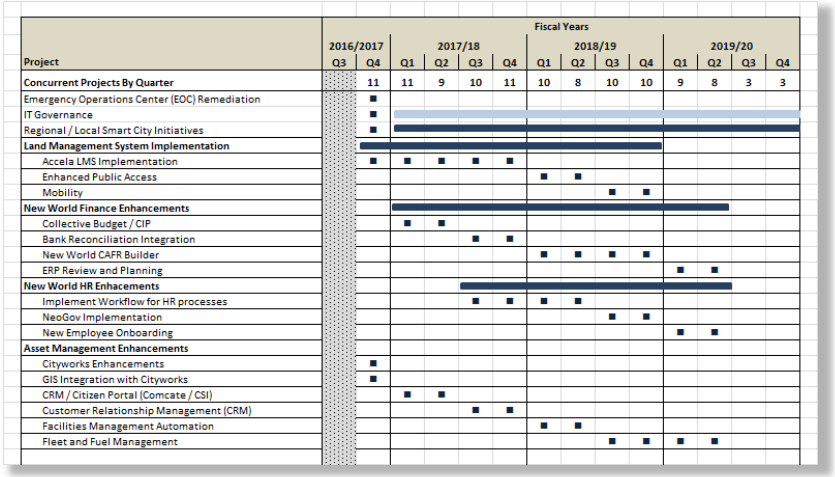

Figure 3 – High-Level Project Roadmap

Figure 3, High-Level Project Roadmap, provides an abbreviated timeline for the City's highest priority projects as established during the Project Prioritization Workshop that was conducted on Thursday, June 22. In addition, over seventy IT infrastructure projects were identified for completion through FY 2019/20. Although many of these projects will not be directly apparent to the

user community, they will have a direct impact on the ability of the user community to deliver services to the public and support the City's internal operations by improving performance and reliability.

Please see Section 4, IT Strategic Plan Update for more detailed information on the workshop and the steps in the development of the project roadmap.

Next Steps

The next steps for the City in the process include:

- *Actively managing the implementation of the IT Strategic Plan including:*
  - Augmenting the City's processes for information technology governance, with the objectives of shaping and maintaining a vision for the City's use of information technology and using that vision to establish which proposed projects are most closely aligned with the vision and that will contribute to its realization
  - Taking a creative approach to the implementation of the projects identified in the IT Strategic Plan since ITD does not have sufficient resources available to handle all of the projects, and while the use of cloud-based services can reduce some of the need for internal resources, it does not eliminate it, and actually creates additional resource needs in areas such as project management and business analysis
- *Keeping the City's primary objectives in sight and ensuring that they have sufficient resources including:*
  - The continuing enhancement of the City's implementation of Tyler's New World ERP to provide additional capabilities and efficiencies for financial and HR processing
  - The implementation of Active.Net as a replacement for Class
  - The implementation of Laserfiche Rio including the implementation of the workflow management capabilities of the product
  - The implementation of Accela for permitting
  - Enhancement of the business license capabilities in New World including an online portal for obtaining and renewing business licenses
  - Expansion of the features and functionality made available to the public through the City's web-site and mobile devices
  - Enhancement of asset management capabilities including implementation of customer relationship management functionality for Cityworks
  - Implementation of "Smart City" capabilities
  - Implementation of key IT infrastructure projects (including the renovation of on-premises hardware and software as well as the increased use of cloud-based services as needed) to ensure the reliability, availability, and performance of the City's business applications
- *Taking steps to improve the availability, reliability, and performance of the City's information technology infrastructure including renovating on-site facilities, and upgrading existing hardware, software, and network equipment*

Section 2 – Current IT Environment

2.1 - IT Assessment

The information to support a revised assessment of the City's IT environment in 2017 compared to 2015 was developed based on information gathered through:

- "Voice of the User" Survey: An anonymous, City-wide survey of user satisfaction with the services being provided by the Innovation and Technology Department
- Interviews with key user stakeholders
- Interviews with ITD staff
- An assessment of the degree to which ITD (and the City as a whole) conform to a set of IT best practices

The results from each of these are discussed below.

2.2 – Summary of the "Voice of the User" Survey

Between Thursday, March 16, 2017, and Friday, March 31, 2017, NexLevel conducted an anonymous on-line survey of the employees of the City of Cupertino (City) to assess their satisfaction with the support they receive from the City's Innovation and Technology Department (IT). Of the approximately 187 City employees invited to take the survey, 84 employees responded (45%). The number of respondents to the 2015 and 2017 surveys was nearly the same (82 in 2015 compared to 84 in 2017), as was the relative proportion of managers (executives, managers, and supervisors) to non-managers (33% / 66% in 2015 compared to 31% / 66% in 2017).

Table 1, Comparison of User Satisfaction in 2015 and 2017 User Surveys, looks at the change in user satisfaction for 13 survey questions that were common to both surveys. User satisfaction increased in all of the questions, notably:

- User satisfaction with ITD's understanding of the City's business objectives and with ITD's planning of technology projects increased 20% or more from 2015
- User satisfaction in other areas, including ITD's management of information technology projects, understanding of the technology that departments use, ability to access information from City and external sources in a timely manner, network availability, and communication on the status of problems or requests, increased between 10% and 15% from 2015
- User satisfaction increased marginally in those areas where ITD did well in 2015

Table 1 – Comparison of User Satisfaction in 2015 and 2017

Question	User Satisfaction		
	2015	2017	Change
How satisfied are you with IT's communications on service metrics, outages and maintenance?	93.0%	97.3%	+4.3%
How satisfied are you with IT's control of malware and spam (unwanted e-mail)?	85.0%	90.5%	+5.5%
How satisfied are you with your ability to access information from City and external sources in a timely manner?	82.0%	93.1%	+11.1%
How satisfied are you with network availability (can consistently access the network when you need it)?	89.0%	98.6%	+9.6%
How satisfied are you with IT's communication on the status of your problem or request?	83.0%	93.5%	+10.5%
How satisfied are you with IT's follow-up on service provided?	79.0%	87.4%	+8.4%
How satisfied are you with the time it takes IT to resolve your problem?	88.0%	96.2%	+8.2%
How satisfied are you with the time to acknowledge your request for service?	95.0%	96.2%	+1.2%
Please rate your satisfaction with IT's management of technology projects:	62.0%	77.2%	+15.2%
Please rate your satisfaction with IT's planning of technology projects:	60.0%	80.1%	+20.1%
Please rate your satisfaction with IT's understanding of the technology that your department uses:	81.0%	92.6%	+11.6%
Please rate your satisfaction with IT's understanding of your department's business objectives:	80.0%	88.8%	+8.8%
Please rate your satisfaction with IT's understanding of the City's business objectives:	75.0%	96.2%	+21.2%

2.3 – Summary of User and ITD Interviews

2.3.1 - User Interviews

City Manager

The City Manager noted that the Council is very results-oriented and that he has expectations and objectives for the City in its use of information technology and for the role of the Innovation& Technology Department in helping the City realize the objectives. These include:

- Making better use of information technology, particularly through user training (and keeping user competencies current), adopting best practices, and ensuring that City staff members have the tools that they need
- ITD should be the City's in-house consultants, anticipating needs and fostering innovation. The City particularly needs I&T to help evaluate the past performance of technology vendors and to assess the ability of the vendor to deliver
- Performance measures will play an increasingly important role for the City in assessing the effectiveness of programs and allocating resources. Having Business Analysts on staff has now has been beneficial and will be critical for the City in the future

Technology, Information & Communication Commission (TICC)

The Technology, Information & Communication Commission (TICC) is an appointed body that advises the City Council on technology matters. TICC has developed and adopted, or is considering, recommendations for the development of policies and programs

that are relevant to the IT Strategic Plan in a number of areas including:

- TICC has endorsed the implementation of Smart City capabilities beginning with energy management
- Extending fiber-based broadband internet access across the City in manner analogous to public utilities such as water and power so that consumers could plug into broadband access in much the same way as any other utility. In addition to promoting the delivery of "Smart City" features, this is also seen as providing the infrastructure for future technology start-ups
- Leveraging public/private partnerships to extend the delivery of City information and services to the community, with the City acting as a facilitator to promote continuous improvement
- The City is seen as doing a "fair" job of providing information to the public with major concerns being ease of use and making information of interest to the community (such as ordinances) more readily available

Departmental Concerns and Priorities

Common user concerns and priorities identified in the course of the meeting with the key stakeholders including:

- An appreciation for the improvements in the services being delivered by ITD
- Concern regarding the number of business applications in place and the need to either consolidate business applications going forward or improve information sharing between them
- A greater focus on customer relationship management (CRM) in handling community concerns
- The need for mobile access to City information and services to support field operations including the ability to take payments in the field as well as digital signatures
- The need to have a coherent strategy for digital government that will enable the City to meet increased public expectations including:
  - Engagement / interaction with the community
  - Support for multiple languages
- Multiple interviewees expressed concern regarding public satisfaction with the City's web-site
- Broad-based needs for improved document management and electronic workflows (including workflows that are event- based as well as document-based)
- Increased public demands for access to City information on issues of concern (PRAs)
- Meeting increased demands for reporting to the State and other agencies regarding environmental issues including reduction of greenhouse gasses and sustainability
- Making the City's Intranet site more useful and accessible to City employees
- Issues with document management including the significant effort related to imaging existing hard-copy documents and ensuring that all document management users are using a consistent approach to the classification and indexing of documents

2.3.2 - ITD Interviews

Chief Information Officer

The Chief Information Officer was recruited by the City following the 2015 IT Assessment. Since arriving at the City, his immediate objectives have been to:

- Stabilize the City's information technology infrastructure through hardware replacement, facility clean-up, and making more effective use of virtualization (including hyperconvergence)
- Re-organize the department to enable it to function more effectively and to better support the City's user community. This has included working with City management to create a new office space for ITD staff at City Hall so bring the staff together
- Develop effective working relationships with the City's management team and department heads
- Augment permanent IT staffing by reducing the use of external services
- Promote innovative uses of information technology (specific projects have included
  - Upgrading Laserfiche to a more current version with more functionality (Laserfiche Rio)
  - Assisting Community development in the acquisition of a new land management system (Accela)
  - Updating the City's web-site and migrating it to an industry-standard platform
  - Assisting Recreation in the replacement of the Class application (vendor support for Class will end in 2017)

The CIO has significant plans to further improve the City's information technology infrastructure in FY 2017/18 though FY 2019/20 including:

- Working with the City's management team to make the IT governance process effective and standardizing the procurement process for IT products and services
- Continuing to Improve ITD's support for business applications (this was a weak area in 2015)
- Implementing new processes for disaster recovery and business continuity (including UPS expansion and potentially migrating some components off-site)
- Replacing the firewalls
- Core switch refreshment and upgrade of the edge switches
- Desktop refreshment (including a move from Windows 7 to Windows 10 as new desktops are delivered and installed)
- Local area network upgrades with the objective of improving service at sites that are slow and building in additional redundancy
- Application initiatives include working with Finance, HR, and other users to obtain greater efficiencies in the use of the City's ERP system including the use of New World's contract module as well as continued efforts to improve the use of document management capabilities including workflow
- Implementing formal processes and procedures to supplement and stabilize the ad-hoc processes presently in place
- Implementing programs for security awareness
- Developing a regional roadmap for GIS

GIS

The GIS team's primary objectives include:

- Web design, creating a more professional package of GIS services and making them visible to the community through the City's web-site, including better branding the City's GIS services
- Making applications, such as City Finder, more user friendly for public users
- Implementing bi-directional interfaces between GIS and Cityworks
- Providing a point of integration between the City's asset management system and the financial system
- Increasing the amount of data in the GIS system (such as aerial imagery, the tree inventory, and documents) to make these information assets accessible to the City's users and the community. The City has been working to get more documents (especially plans) into Laserfiche

Project Management / Applications

Although these services existed within the City in 2015, they have now been organized into a division within ITD that is charged with assisting users with the selection and implementation of business applications as well as assisting them in making more effective of the applications. Directions and priorities include:

- Providing project management / business analysis support for existing projects including:
  - Replacing the Class application for Recreation
  - Evaluation and implementation of Accela, including integration with New World and GIS
  - Evaluating EnerGov as a replacement for the City's existing asset management system
  - Assisting the users in fine-tuning the implementation of New World / Logos
  - Upgrading Laserfiche to a newer version and implementing automated workflow management
- Supporting efforts to increase transparency (GIS OpenData, and Peak Democracy) and citizen engagement (public-facing portals and mobile applications)
- Fostering collaboration between user departments regarding process and information sharing
- Establishing a project management office (PMO) service to foster the development of project management skills and the use of project management best practices

Video (Media Communications)

Much of the work of this unit is related to:

- Supporting the City's efforts at transparency including streaming City Council meetings, operating the City's public access channel, and the City's YouTube channel
- Supporting emergency communications
- Supporting digital signage

Priorities and directions include:

- Providing project management for the multi-phase upgrade of the Council Chambers
- Cinematography and post-production editing

- Maintaining and upgrading video storage capabilities, including evaluation of replicating video content to the cloud
- Providing project management and design services for the upgrade of the AV facilities in the City's conference rooms and multi-function rooms with the objective of standardizing configurations to enable the sharing and streaming of content through the sub-net

2.4 - IT Best Practices Conformance

As part of the ITSP update, Innovation and Technology Department managers and staff reviewed the IT best practices checklist that was prepared in 2015 and updated it to reflect the current status (the completed checklist is provided as Appendix C). The City's responses were then reviewed by NexLevel. Figure 4, Comparison of IT Best Practice Conformance, 2015 and 2071, depicts the results of this analysis.

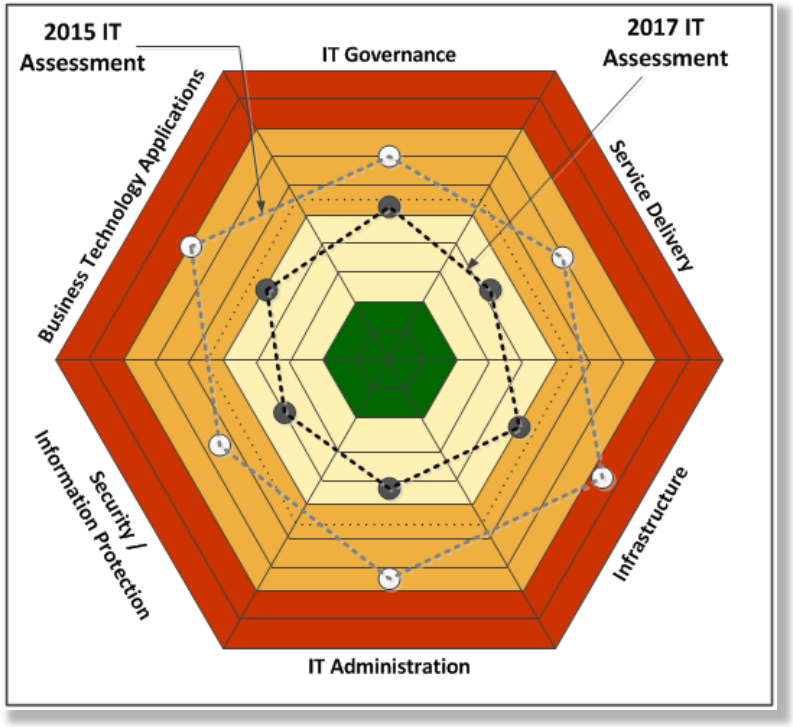

Figure 4 – Comparison of IT Best Practice Conformance, 2015 and 2017

Each of the rings in Figure 4 represents a level of conformance to the IT best practices with the red band representing 0 to 20% conformance, the orange band representing 20 to 50% conformance, the tan band representing 50 to 80% conformance, and the green band at the center representing 80% to 100% conformance.

NexLevel's model for IT best practice conformance is divided into six dimensions: IT governance, service delivery, business technology applications, infrastructure, security / information protection, and IT administration – each represented by one side of the hexagon. The City's conformance to best practices is mapped by a dot within each of the dimensions based on the level of conformance. The dots are then connected to visually portray the City's overall level of conformance. The lighter dotted line connecting the white dots represents the level of IT conformance that was seen in 2015 and the darker dotted line connecting the dark gray dots represents the City's current level of conformance to the IT best practices.

The degree of IT best practice conformance has some significance. NexLevel views organizations that have less than 50% conformance to the IT best practices as being essentially reactive in their approach to the governance, management, and delivery of information technology services while organizations that are more than 50% conformant to IT best practices are regarded as being proactive. The plotting of the dots indicates that the City's conformance to the IT best practices in 2015 was generally characteristic of an organization that is reactive, while the City's conformance in 2017 is more characteristic of an organization that is proactive.

Organizations that are more proactive are typically better able to obtain greater benefits for their investments in information technology than those that are not, and while reactive organizations often spend less on information technology they also realize less in return and are generally unable to effectively respond to new requirements. Another way of looking at the difference between

reactive and proactive organizations is that the focus of proactive organizations is generally on innovation and improving service quality and effectiveness while reactive organizations are generally focused on maintaining existing service levels and "fire-fighting."

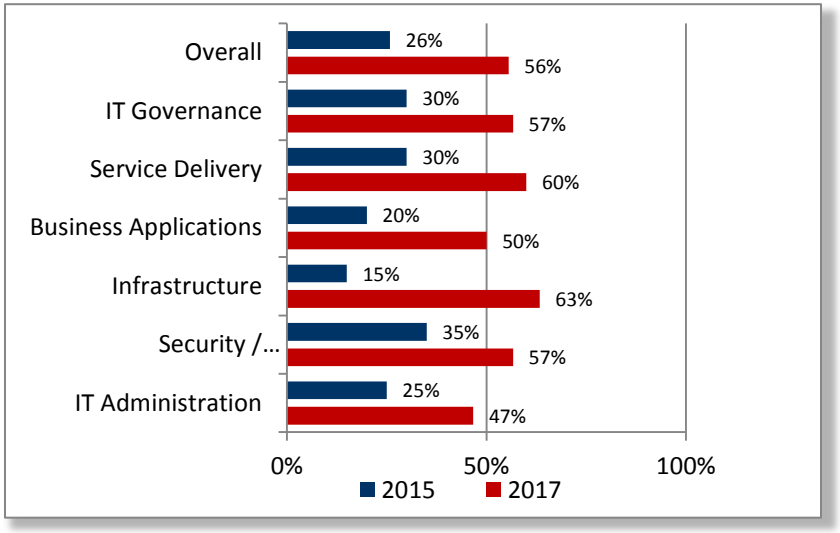

Chart 3 – Year over Year Changes in IT Best Practice Conformance

Chart 3, Year over Year Changes in IT Best Practice Conformance, provides a more quantitative analysis of the City's improvement in conformance to the IT best practices occurred from 2015 to 2017. Within each dimension of the IT best practices model, the City's conformance improved in 2017 with the largest gains in infrastructure and IT administration.

A note of caution is that many of these gains have occurred without the City achieving full conformance with each of the IT best practice factors, meaning that ITD has yet to fully adopt formal procedures in many of these items. In the absence of formal procedures, ITD may be challenged to maintain this level of conformance over time.

Section 3 – Enterprise Information Technology Trends

Source: NexLevel

Innovation has always been at the core of information technology – successive developments in information technology, most recently in mobility, have dramatically changed the IT landscape as much as IT has altered the way in which organizations conduct their business and modified user expectations regarding accessibility to government services and information. Information technology innovations have compelled local governments to reassess how they invest in information technology and deliver information technology service.

Like rafters, organizations seeking to use information technology effectively may have a general idea of where they are going but often encounter obstacles, some known and some unexpected, along the way. As a result, organizations seeking to develop effective information technology strategic plans need to consider a number of different factors including internal user needs, public expectations, and trends in information technology to better allocate funds and resources in support of their business objectives and priorities.

While public sector organizations must also become more customer-centric and innovative, they also must find ways to control their total cost of ownership (TCO) for information technology and demonstrate that they are obtaining the greatest possible value for their investments (commonly measured as return on investment – ROI).

The ways in which organizations use information technology have evolved considerably with the emergence of web-based ("cloud") services, the consumerization of information technology, and mobility. The continued introduction and rapid evolution of information technology products and services will impact public sector organizations in a number of ways including:

- *"Smart" Cities:* The need to respond to increased public expectations for access to information and services is forcing a shift in the allocation of information technology resources from internal uses to public-facing uses including the creation of new products and services as well as the integration of new and existing information technology services and their delivery to the public as part of the implementation of "Smart City" capabilities

- *Mobility:* The growing adoption of mobile computing as the solution of choice for remote access to internal applications and repositories of information and the desire of users to have the same "desktop environment" on a remote device as they have in the office will drive the creation of new policies, support models, and security models
- *Resources:* In the face of a highly diverse and evolving market of new information technology products and services and the demand for their use, organizations will be increasingly challenged to allocate limited IT resources

While predicting the future of information technology can be problematic, NexLevel has identified eight enterprise information technology trends that are changing how local governments invest in IT. Broadly, NexLevel considers that these trends either support:

a) *Leverage (ROI):* The City's ability to leverage, i.e. extend or protect, existing information technology services. The ability to extend an existing information technology service improves the City's return on its investment (ROI) in that service; or

b) *Innovation (Value):* The City's ability to utilize innovations in information technology in order to support the delivery of new services to the community as well as to accommodate new ways in which the public accesses information and services. Innovation typically produces greater value, but often at greater cost

Figure 5, Enterprise Information Technology Trends, places each of the trends discussed in this section into that context.

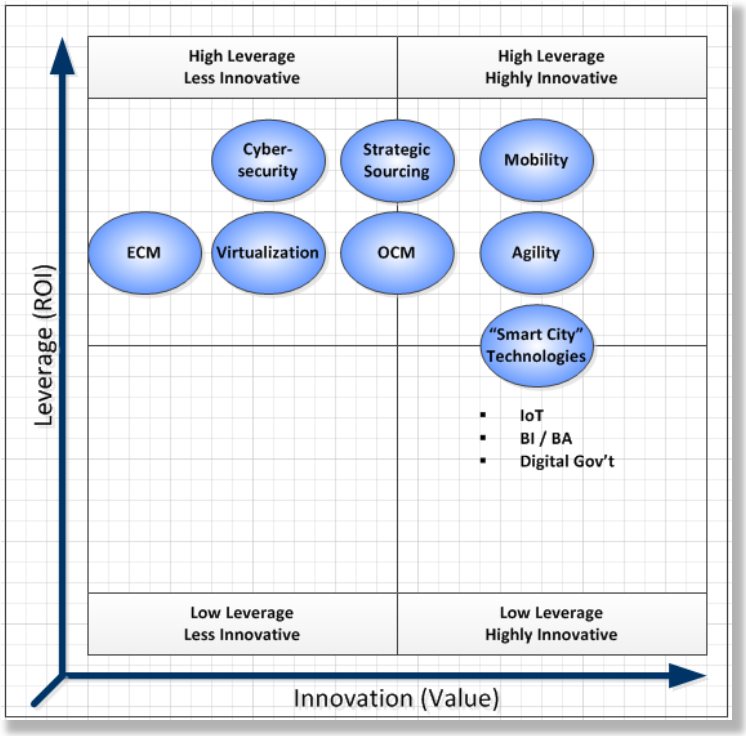

Figure 5 –Enterprise Information Technology Trends

Ultimately, organizations need to find a balance between investing their limited resources in better leverage existing information assets (less risk, greater short-term operational impact) versus investing in innovative technologies that have the potential to radically transform how services and information are delivered to the public (often with greater risk, but also with greater long-term operational impact).

Within this context, there are no "wrong" directions; rather local governments must plan to invest in information technology based on both immediate and long-term needs. Where possible,

investments should be targeted in information technology trends based on:

- The ability to leverage existing IT resources as well as support innovation
- The benefits to be derived through the implementation of the information technology compared to the initial and recurring costs involved (considering both direct and in-direct costs)
- The ability of the organization to effectively implement and support the technology

The information technology trends identified in Figure N are discussed below.

⇒ IT Trend: Smart City Technologies

> **"A smart city is defined as a city that engages its citizens and connects its infrastructure electronically. A smart city has the ability to integrate multiple technological solutions, in a secure fashion, to manage the city's assets…"** – Dr. Sam Musa

As noted by Dr. Musa, the use of information technology to promote the creation of "Smart Cities" is unusual in that this trend is not a single technology, per-se, but rather represents an integrated approach to the utilization of emerging information technologies and technology trends that enable local governments to more effectively identify trends (such as incidents, traffic, power demand, parking space availability, etc.), to re-allocate or reprogram City resources in response to these trends, and to support programs such as Smart Building, autonomous vehicles, Smart Payment, and Smart Street Lights. Smart City capabilities also enable members of the community and visitors to obtain information through smartphone apps regarding employment services, public safety, healthcare, social services, transit and driving route information, parking and transit service options, and event information.

The Internet of Things (IoT) provides the foundation for many Smart City Initiatives. For some time devices have stored data so that it could be manually downloaded and accessed on demand. Combining this capability with the ability to access the internet (and thus the ability to both autonomously receive and transmit information) has brought us to the IoT. McKinsey has suggested six distinct types of applications to consume this information; tracking behavior, enhanced situational analysis, sensor-driven decisions analytics, process optimization, optimized resource consumption, and complex autonomous systems (such as collision avoidance).[1]

Although some local governments look at Smart City in very tactical terms (involving highly-specialized IoT applications such as "Smart Intersections" and "Smart Corridors"), the effective implementation and continued use of Smart technologies includes:

- The development and implementation of open and collaborative processes to develop the visions for the implementation of Smart technologies as well as for the continuing governance of the Smart City initiative. Governance should include the ability to prioritize initiatives, program funds, and take advantage of opportunities made possible by private / public partnerships, and to assess the reproducibility of interoperable solutions. The governance process will also need to provide leadership for the management of the

[1] http://www.mckinsey.com/industries/high-tech/our-insights/the-internet-of-things

changes in city operations brought about by smart technologies

- The implementation of secure, resilient, and ubiquitous wireless services that enable access to smart services from any device, anywhere, and anytime and that can scale to meet expected surges in demand (such as events) as well as unexpected surges in demand. Planning for the resilience, security, and performance of the wireless services is critical as is the development of processes and agreements to support 24 x 7 operations

  IBM has noted that "A resiliency plan should concentrate on both the business and IT processes that are most vital to the enterprise. Creating and sustaining processes that support resilient business operations and infrastructures requires identification of the minimum required process functionality during disruptive events, alternate processes and procedures that will allow operations to continue during times of stress, and redefinition of processes to achieve better workload balance"[2]

- The development of a comprehensive plan for the implementation and continuing support of the Smart City services that leverage public / private partnerships as well as regional partnerships (including regional transportation) including plans for regional collaboration and information exchange)

- The development and implementation of a plan and the processes required to support continuing communication and collaboration with members of the community as well as the development and implementation of the capabilities to leverage the information produced by smart devices - including business intelligence and business analytics

Business Intelligence and Business Analytics (BI/BA)

There has been considerable progress in the development of tools that enable organizations to consume a growing body of information for either tactical / reactive purposes (business intelligence) or for strategic / proactive purposes (business analytics). The collection, aggregation, and analysis of information from disparate business units and sources across an enterprise are often referred to as "Big Data," by the information technology industry. Big Data provides the foundation for business intelligence and business analytics. Recent trends in this area have included making these tools more "user friendly" and available

The development and maintenance of the "enterprise data architecture" required to support the use of BI/BA tools is one of the "hidden costs" of implementing Smart City technologies. This includes the costs related to:

- Processes and staff to support the architecture (including processes for its governance, support, and evolution) since both the data being collected and the organization's use of the data will change over time
- Standards and policies to ensure that business applications will be able to exchange information with other business applications and support the integration and compilation of information

Organizations without an enterprise data architecture, supporting standards, and staff to support it, often attempt to support decision-makers through a cumbersome combination of ad-hoc applications, databases, and spreadsheets. These tools often use data inconsistently, are seldom well

[2] "The Evolution of Business Resiliency Management," IBM Global Technology Services, Thought Leadership White Paper, June, 2011

documented or able to quickly meet new requirements, and eventually become a drain on organizational resources. This can quickly become a worst-case scenario as the total cost of ownership for these ad-hoc processes quickly mounts while the return on the organization's investment decreases.

Digital Government

Broadly, digital government is considered to be a comprehensive approach to the use of the Internet and mobile technologies as a conduit for providing information to the public and to enable them to conduct business. The development and maintenance of a digital government strategy has become more complex due to the rapid multiplication of the number of channels for communicating with the public as well as the continued evolution of mobile devices. Organizations must be prepared to deal with "any device (including any browser), anywhere, anytime"

The Federal Government has adopted a digital government strategy that is built on four principles which could be adapted for the use of other government agencies. The principles include:

- *An "Information-Centric" approach* – Moves us from managing "documents" to managing discrete pieces of open data and content which can be tagged, shared, secured, mashed up and presented in the way that is most useful for the consumer of that information
- *A "Shared Platform" approach* – Helps us work together, both within and across agencies, to reduce costs, streamline development, apply consistent standards, and ensure consistency in how we create and deliver information
- *A "Customer-Centric" approach* – Influences how we create, manage, and present data through websites, mobile applications, raw data sets, and other modes of delivery, and allows customers to shape, share and consume information, whenever and however they want it
- *A platform of "Security and Privacy"* – Ensures this innovation happens in a way that ensures the safe and secure delivery and use of digital services to protect information and privacy[3]

⇒ IT Trend: Organizational Agility

Organizations must be agile in order to effectively respond to new business requirements and public expectations for access to information technology services. Agility does not just happen – it is the product of insightful investments by organizations in information technology planning and resources. - NexLevel

Agility is both a trend and an outcome of the significant changes that have taken place in how local governments (and other organizations) respond to both new information technologies and how those information technologies are used by the public. The ability to agilely respond to both changes in IT and changes in user and public expectations rests largely on the ability of an organization to identify and prioritize requirements and to allocate and/or reallocate both IT and user resources accordingly. Effective planning and IT governance are key components of organizational agility.

[3] Digital Government: Building a 21st Century Platform to Better Serve the American People, US Office of Management and Budget, 2012

Agility enables organizations to stand-up solutions to support new business requirements by:

- Re-using existing information technology assets (data, applications, infrastructure, and personnel)
- Developing or acquiring new assets
- Some combination of the above

Planning documents often speak to the need to align technology plans and directions with business or operational needs and priorities – generally this implies a two-step process in which operational plans are developed and then technology plans are crafted to support them. NexLevel believes that this process is not as effective as it could be since the transformative impact of technology should be considered in the course of developing business plans, not afterwards. Industry best practices and research confirm that organizations that integrate business and technology planning in a common framework achieve better results than those that do not.

IT Governance is used as the catalyst to ensure the alignment between an organization's business goals and priorities and how it allocates its information technology resources and assets. In the absence of effective alignment of business and information technology direction scarce resources can be allocated for IT projects that may be interesting but fail to deliver real benefits to the organization.

⇒ IT Trend: Virtualization / Hyperconvergence

The virtualization of IT infrastructure is not a new trend in information technology; the virtualization of servers (the division of a physical device into multiple virtual devices) has been a staple for information technology organizations for some time. Virtualization is based on the replacement of separate hardware-defined systems with software-defined environments, usually managed by a software product known as a "hyperviser." Virtualization provides significant benefits including improved utilization of physical devices and a reduction in the number of physical devices in the data center. On the desktop side of the IT architecture, virtual device infrastructure, although not fully mature at this time and not a universal solution, offers organizations the opportunity to replace desktops that are reaching end-of-life with replacements that are less expensive and easier to maintain.

Virtualization is continuing to evolve, specifically with regard to the deployment of hyperconverged infrastructures, which enable organizations to integrate multiple types of storage devices (including traditional disk storage, solid-state storage) into a single virtual appliance that can provide a greater number of I/O operations per second (IOPS) to support varied workloads that include transaction processing as well as sequential data access for reporting, business intelligence, etc. Other benefits of hyperconvergence include simplified management of the IT infrastructure, the ability to streamline data backup and recovery, and the ability to more effectively deploy business continuity / disaster recovery solutions.

A related trend is the development of "application containers," – an application container consists of an entire runtime environment that includes the business application, plus all of the system software and configuration files needed to run it. The primary advantage of application containers is that they are relatively independent of physical devices (such as servers) and the differences between them (such as the version of the operating system in use, etc.).

⇒ IT Trend: Organizational Change Management (OCM)

The introduction of new enterprise-wide business applications and/or modifications to existing business applications often involves changes to existing business processes and organizational structure; and these changes, as well as the effort required to implement the business application, have the potential to disrupt operations. Additionally, organizations have found that resistance to change can limit their ability to realize the intended benefits of business applications and prolong implementation projects, sometimes to the point that project success is placed in jeopardy.

Organizational change management (OCM) provides a methodological framework for managing the organizational impact of the implementation of new automation including changes in business processes, changes in organizational structure, and changes in culture (including changes in focus and changes in how performance is measured) by focusing on improving communication, setting expectations, and working to minimize the impact of misinformation.

In 1995, John Kotter introduced an eight-step process (which has since been updated, but the original version is nonetheless highly applicable) for fostering the successful implementation of changes in organizational structure, business processes, and culture.[4] Kotter's framework for change management included:

- Creating a shared sense of urgency regarding the need to change
- Forming a guiding coalition across the organization to support change
- Creating a vision for change
- Communicating the vision
- Preparing to overcome obstacles
- Planning for, and delivering, short-term wins to sustain momentum
- Remaining committed to the long-term process required to transform organizations
- "Anchoring" the changes in the culture of the organization

Organizational change management is also dependent on performance management since it provides an objective and factual assessment as to whether the organization is obtaining the desired outcomes from changes to business processes, structure, and resourcing and the effectiveness of any subsequent steps that may be needed to overcome obstacles.

⇒ IT Trend: Cybersecurity

While the need to secure information systems is not new, the increased focus and importance of cybersecurity is a direct result of the increased utilization of the web for the delivery of information and services and the related rise in the use of mobile and personal devices. In 2016, the President's Homeland Security and Counterterrorism Advisor warned that "we are in the middle of a revolution in the cyberthreat – one that is growing more persistent, more diverse, more frequent, and more dangerous every day."[5]

Cisco, a leading network component and firewall manufacturer and service provider, has noted that:

[4] Leading Change, John Kotter, Harvard University Press, 1995, http://www.kotterinternational.com

[5] "Citing a 'revolution,' Obama issues response plan," The San Francisco Chronicle, July 27, 2016

> The shift toward mobility and cloud services is placing a greater security burden on endpoints and mobile devices that in some cases may never even touch the corporate network. The fact is that mobile devices introduce security risk when they are used to access company resources; they easily connect with third-party cloud services and computers with security postures that are potentially unknown and outside of the enterprise's control. In addition, mobile malware is growing rapidly, which further increases risk. Given the lack of even basic visibility, most IT security teams don't have the capability to identify potential threats from these devices.[6]

In this environment, organizations can be crippled not just by attacks which result in the disclosure, modification, and destruction of information but also by attacks which takeover critical infrastructure components (and potentially disable them or hold them hostage through the installation of "ransom ware"), or impede the ability of legitimate users to access information and services ("denial of service" attacks).

The nature of cybersecurity threats is continually evolving due to the growing sophistication of hackers, the resources available to them, and increases in the range of motivations from mischief and activism to profit. As a result, the community of hackers has expanded to include criminal enterprises that profit through extortion as well as through the theft of digital assets (such as social security numbers, account numbers, etc.).

As a result, organizations must adopt and implement systematic approaches to protect their information assets from cyber threats including the ability to detect and defeat these threats, limit the impact of potential intrusions, recover from them, and adapt processes to better manage similar attacks in the future. The National Institute of Standards and Technology (NIST) has developed a cybersecurity framework (depicted in Figure 6, NIST Cybersecurity Framework) below, that enables organizations to progressively implement procedures to safeguard against cyber threats.[7]

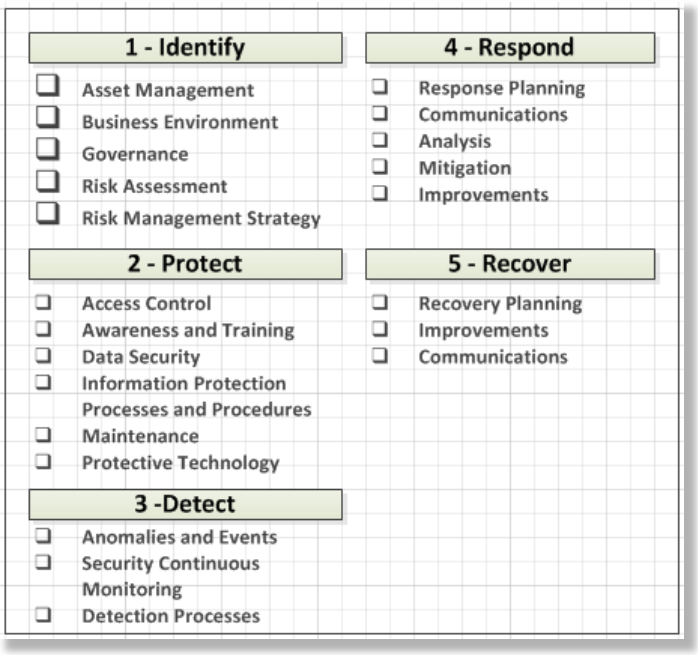

Figure 6 – NIST Cybersecurity Framework

[6] Cisco, 2014 Annual Security Report, http://www.cisco.com/web/offer/gist_ty2_asset/Cisco_2014_ASR.pdf

[7] http://www.nist.gov/cyberframework/index.cfm

⇒ IT Trend: Enterprise Content (and Document) Management (ECM)

"The amount of digital content that we are capturing is exploding. Video cameras are popping up all over the place." - Anonymous IT Manager, speaking with NexLevel

The management of enterprise content (including documents, audio, video, and images) is not a new trend; however, with the accumulation of increasing amounts of content (particularly video) organizations are adopting enhanced ECM strategies and capabilities to:

- Better organize and catalog documents and digital content so that they are more readily available across the organization and to ensure that users have access to the most current versions (organizations that have multiple repositories for the storage and management of documents and content find that these are often implemented and used inconsistently and that they increase the organizations total cost of ownership)
- Improve the ability to collaborate with internal and external users (including the ability to annotate)
- Control access to documents (and to portions) of documents including permissions to add, read, copy, modify, and delete
- Conform to records management requirements
- Search documents and content in conformance with public records requests
- Support users working from remote locations, particularly workers in the field using wireless access

More recently, organizations have also realized that the absence of a document and content management framework limits the usefulness of field mobility since this depends on the ready availability of content. Consuming bandwidth and time to search for documents is frustrating for end-users and increases organizational costs for mobility.
Gartner Research has noted that:

> The term "enterprise content management" (ECM) describes both a strategic framework and a technical architecture that supports all types of content (and format) throughout the content life cycle.
>
> As a strategic framework, ECM can help enterprises take control of their content. It can contribute to initiatives around transactional processes, compliance and records management as well as sharing and collaborating around content and documents.
>
> As a technical architecture, ECM can be delivered either as a suite of products integrated at the content or interface level or as a number of separate products that share a common architecture.[8]

Industry statistics regarding the costs related to the manual management of content (including the unstructured storage of documents and content in directories on network drives) are very compelling and have been validated by successive independent studies. A guide published by Laserfiche (an ECM software provider) notes that "A recent PriceWaterhouseCoopers study reports that the average worker spends 40% of their time managing non-essential documents, while the International Data Corporation (IDC) estimates that employees spend 20% of their day looking for

[8] Gartner Research, Magic Quadrant for Enterprise Content Management, 2015

information in hardcopy documents and only finding what they need 50% of the time."[9]

Finally, an organization's ability to achieve a near-paperless environment is greatly dependent on the implementation of EDCM capabilities that are robust and user-friendly.

⇒ IT Trend: Mobility and the Consumerization of IT

> **"Customer-centric government means that agencies respond to customers' needs and make it easy to find and share information and accomplish important tasks... The mantra of "anytime, anywhere, any device," is increasingly setting the standard for how information and services are both delivered and received in a two-way exchange of information and ideas."** – Digital Government: Building a 21st Century Platform to Better Serve the American People, US Office of Management and Budget

The consumerization of information technology refers to the use of personal devices, most often mobile, to obtain access to organizational services and information (also sometimes referred to as BYOD – bring your own device). As a result, consumerization and mobility are closely linked. Collectively, they represent a significant opportunity for government to become more custom-centric and to improve the effectiveness and timeliness of service to the public; however, they are also vexing for enterprise IT planners since:

- The proliferation of devices is a challenge for support organizations as users attempt to obtain connectivity to secured wireless networks and utilize applications. It is estimated that the introduction of mobility in an organization can increase Help Desk Workload by as much as 10%[10]
- User access to enterprise information and services from mobile / wireless devices potentially exposes them to cyber-attacks
- Public-facing solutions need to be both open and adaptive to optimize user experience from a universe of devices, (each with different screens, browsers, and operating systems) that is continually evolving
- "Follow me" mobility fundamentally changes the paradigm of the standard desktop computing model where the computer, the operating system, the applications, plus the user's data and preferences are integrated into a single platform (either a desktop PC that remains in the same location or a laptop or notepad that moves with the user and then connects to the host network). Whereas desktop computing is device and location centric, mobility is user centric

Despite these challenges, mobility is a "game changer" in the public sector, enabling users to move as needed and to enter or update information on a real time basis thus eliminating the need to capture information on paper or offline and then enter or upload the information in the office. In addition, mobility enables access to information where/when it is most needed (i.e., in responding to incidents and emergencies).

Support for mobile devices continues to be a vexing issue for many organizations. Some adopt a "bring your own device" policy as

[9] Document Management: The Buyer's Handbook, Laserfiche, http://www.laserfiche.com, 2015

[10] The Impact of Mobility on the IT Service Desk, Gartner, 2013

being preferential to attempting to limit the devices that users employ; often with the caveat that IT support for other than officially supported devices will be provided only as available and with no guarantees as to response time. The practicality of these policies tends to be limited since the priority of a service request tends to be driven more by the nature of the incident or request and the person reporting it than by the device involved.

⇒ IT Trend: Strategic Sourcing of Services and Cloud-based Services

"Interest in cloud technology and cloud economics abounds. While the technology delivers immediate reductions in capital costs, Forrester believes that cloud computing's greatest benefits will come from changes to the IT technology and organizational model… Cloud computing, like mass production, is based on economy of scale and automation. It has shown extensive productivity gains and appears to be the direction needed for IT operations to absorb future production requirements." – "IT Infrastructure and Operations: The Next Five Years: The Cloud on IT's Horizon," Forrester Research

Strategic sourcing is based on the concept of obtaining and using the most effective service providers to respond to user needs and enabling permanent IT staff members to focus on high-priority, high-value tasks and technologies while allocating functions such as the support of COTS business applications and non-mission critical "utility" functions to lower-cost service providers.

For many organizations in both the public and private sector who have aging IT facilities and infrastructures, the use of "cloud" based services including Infrastructure as a Service (IaaS), Desktop as a Service (DaaS), and Software as a Service (SaaS), offer alternatives to initial capital expenditures, the recruitment of additional staff members, or the procurement of traditional staff-supplementation services (contractors). An additional benefit for many organizations is that using SaaS simplifies their disaster recovery and business continuity planning since they can quickly resume operations from a facility that has connection to the internet.

Common strategies for cloud-based services include:

- *Public Cloud* – Public Cloud services for business applications are generally shared (thus "public") with other user organizations and all users of the service sharing a common infrastructure and/or code base but with their data kept separately (but often located in the same physical database). The advantages of a public cloud service include reduced cost (as a result of the cost for the service being spread over a larger number of users), but organizations find that they have less flexibility (the code base generally changes for all users at the same time) and less control over the security of their information
- *Serverless Computing* is a trend within the public cloud where users pay a single, bundled, fee for access to a service rather than separate fees for the resources (servers, storage, etc.) used for the service. The total cost of ownership for a serverless computing service increases or decreases based on demand
- *Private Cloud* – is similar to a public cloud, but in a COTS / SaaS environment the private cloud is based on a separate code base and database for each organization (although multiple organizations may share physical resources in a virtualized computing environment). Since the code base is not shared with other user organizations, users have more control over the timing of updates and the installation of new versions and more control over the security of their

data, but at a higher cost than for Public Cloud services. Organizations can also host legacy, proprietary solutions in a private cloud

- *Hybrid Cloud* – a combination of private and public cloud services, potentially from different service providers. This permits organizations to use more expensive private cloud services for mission-critical applications and confidential information while leveraging the public cloud for less critical and/or confidential applications and information

  The deployment of hybrid cloud architectures is becoming a significant trend. An industry source noted that, ""The ability of hybrid cloud to function as an extension of an existing IT environment and processes allows IT to quickly deliver the agility benefits of cloud computing to the business. IT can use the same management tools and governance policies they have already adopted in their data centers and maintain security and visibility."[11]

  High(er) availability: Hybrid cloud solutions also appeal to organizations that need to have their business applications continuously available, since in a "multi-cloud" environment (that could potentially include both locally hosted and remotely hosted services), access can fail over to the backup service

COTS Business Applications and the Cloud

Commercial-off-the-shelf (COTS) business application providers are increasingly turning to SaaS as their preferred method of delivery. Compared to traditional models where the COTS software is installed in multiple client sites, often with some variation in both the installation of the software and the supporting systems environment and with differing levels of technical currency, SaaS greatly simplifies the process of providing user support and helps limit the variety of releases and versions that the application provider must support. SaaS can be delivered either as private cloud or public cloud offering (with private cloud offering more flexibility and security and public cloud offering the opportunity to lower license / subscription and support costs through the economies of scale). For user IT organizations, SaaS dramatically reduces application management and support costs, particularly with regard to backup and disaster recovery.

Key benefits of cloud-based sourcing include:

- The ability to obtain services under the terms of a service level agreement
- The ability to obtain service coverage for extended hours of operation including 24x7
- The ability to defer, or avoid, capital costs for the acquisition of information technology infrastructure (such as servers and storage devices)
- The ability to more readily scale the IT environment to meet demand
- Reduced dependence on local staff resources, including training and planning for staff succession

[11] Mathew Lodge, vice president, Cloud Services Product Management and Marketing, VMware, cited in White Paper: Cloud Adoption - Hybrid Is the Future, VMware, 2016

Nonetheless, organizations seeking to use external services (cloud-based or not) need to carefully consider:

- Potential issues with data ownership and security including the ability of the cloud-service provider to comply (and to certify continuous compliance) with applicable information-protection standards such as CJIS and HIPAA
- The costs related to implementation including training, data extract and purification, and testing
- The continuing costs for utilization as well as for the management of multiple service providers
- The provisions for the availability and security of information that is stored off-site (particularly if the service is hosted off shore)
- The costs and effort related to potentially exiting the sourcing arrangement in the future

Section 4 – IT Strategic Plan Update

4.1 - Plan Development

> **"It's not the man, it's the plan. It's not the rap, it's the map."** – Ossie Davis, actor, director, poet, playwright, author, and civil rights activist

Strategic planning enables organizations to effectively allocate IT and user resources and to find a balance between immediate and long-term needs. Change is a constant concern for public sector executives who must often respond to increased public expectations and new mandates with limited resources and information technology environments that are not agile. Without an updated IT Strategic Plan to serve as a baseline to manage and respond to change, organizations tend to become reactive rather than proactive and, as a result, obtain reduced benefits for their investments in information technology.

Figure 7, Development of IT Strategic Plan, depicts the process used to develop the IT Strategic Plan for the City of Cupertino:

- Strategic projects were identified based on operational needs and priorities identified in the course of the interviews with the City's user stakeholders, IT needs and priorities, and the recommendations that NexLevel identified for the City
- The resulting project list was then reviewed with the City's management team and refined considering both the user and IT resources that would be required to implement the projects and information regarding information technology trends
- The refined project list then served as the foundation for the planning and prioritization workshop

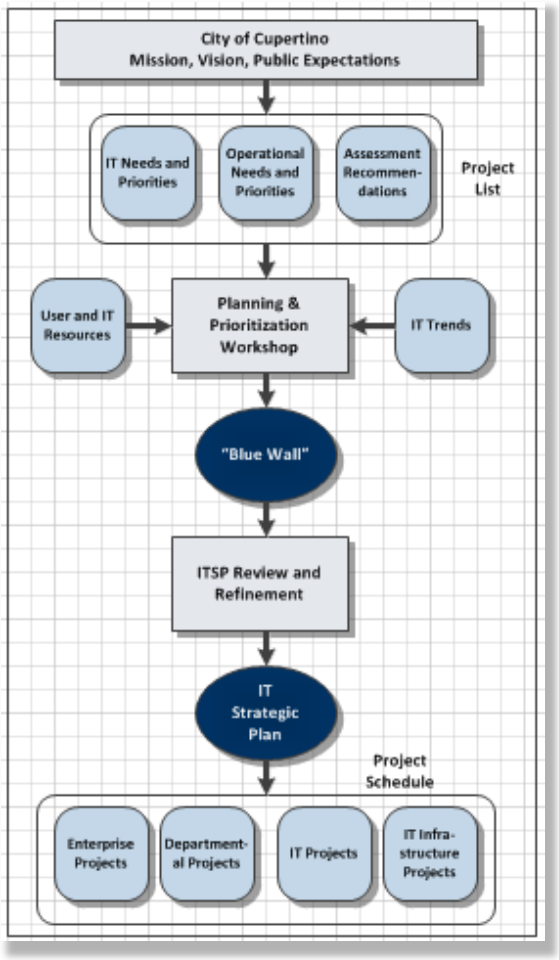

Figure 7 – Development of IT Strategic Plan

- The "Blue Wall" from the planning and prioritization workshop was then reviewed with City Management and provided the basis for the development of the IT Strategic Plan

4.2 - Project Portfolio

Appendix A, Project Portfolio, provides information for each of the projects identified in the course of the 2015 ITSP and the 2017 update including:

- Project ID
- Project Name
- Project Sponsor(s)
- Impacted Departments
- 2015 ITSP Project Status
- 2015 ITSP Est'd Completion Date
- 2017 ITSP Update Project Status
- Project Description / 2017 Update

Appendix B, Project Prioritization Worksheet, provides additional information for each of the projects including:

- Project Title
- Project Sponsor(s)
- Project Status (i.e., In Progress, Planned, Proposed)
- The estimated levels of risk and effort associated with the project
- The estimated low and high costs (in $000's) for each project based on information developed by NexLevel and the City
- The estimated impact on City operations for each project looking at four key factors including:
  - *Community Engagement*, the degree to which the project contributes to improving the ability of the City to provide public access to information and services
  - *Business Enhancement*, the degree to which the project can contribute to improving the City's ability to conduct operations by enabling the elimination of redundant and/or non-value added activities or improving productivity, etc.
  - *Cost Reduction*, the degree to which the project can contribute to reducing the City's total cost of ownership for information technology or otherwise reducing costs
  - *Technology Replacement*, the degree to which the project can enable the City to replace existing components of its information technology infrastructure (including applications, hardware, system software, etc.)
- A weighted score (low, medium, high) based on the estimated level of effort, level of risk, and the business value of the project

4.3 - Project Roadmap through FY 2019/20

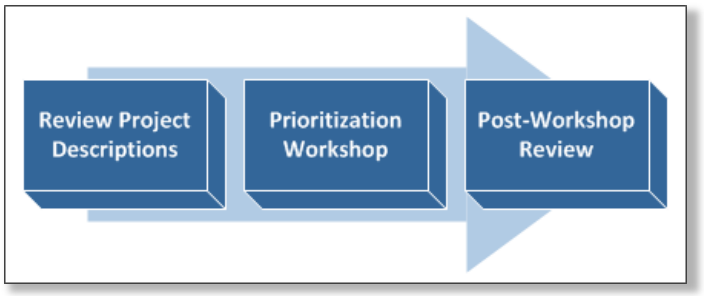

Figure 8 – Development of Project Roadmap

Figure 8, Development of Project Roadmap depicts the three steps in its development:

- Review Project Descriptions
- Prioritization Workshop
- Post-Workshop Review

Each of these steps is discussed below.

Review Project Portfolio

Following the meetings with the user stakeholders and the Chief Information Officer, the Project Portfolio (provided in Appendix A) was distributed to the participants for their review. In the course of the review project descriptions and status were updated, projects were added to the list, and some projects were deleted. The updated Project Portfolio was then used as the starting point for the Prioritization Workshop.

Prioritization Workshop

The "Blue Wall" workshop was conducted on Thursday, June 22. The workshop was conducted in an open and collaborative manner with members of the City's management team including department heads and key stakeholders. The sessions is referred to as "Blue Wall" workshop since NexLevel uses a panel of blue fabric, 11' wide by 4' high, that is coated with an adhesive. The panel is mounted on a wall and pages printed for each of the projects in the Project Portfolio. NexLevel pre-staged the projects onto the "Blue Wall" which was divided into time slots including In Progress, FY 2017/18), FY 2018/19, and FY 2019/20, and a "Parking Lot" for projects that the participants decided to defer at this time.

Ground Rules

NexLevel provided a briefing for the participants that included a review of the ground rules for the workshop. One of the key ground rules was that, given the City's staffing constraints, all new business applications projects would be assumed to be provided as "Software-as-a-Service" (SaaS) with the City leveraging external services to assist in the implementation wherever feasible. Each of the projects was then reviewed by the participants and some additional projects were identified and added to the "Blue Wall" and other projects were consolidated or deleted. NexLevel then facilitated a voting exercise in which each of the participants was given four green dots and used them to identify high-priority projects.

Following the voting exercise, some of the projects were moved into different time slots. Figure 9, Workshop "Blue Wall," depicts the results of the planning workshop. The hand-written pages represent projects that were added in the course of the workshop.

Figure 9 – "Blue Wall" Following Prioritization Workshop

Post-Workshop Review

NexLevel reviewed the project timeline following the workshop and made some adjustments to project durations where appropriate. The revised project roadmap that resulted from the review is depicted in Figure 10, "Blue Wall" Following Post Workshop Review. This view of the "Blue Wall" was developed in Visio and a copy of the source was provided to the City with the final version of the IT Strategic Plan so that it can be modified by the City in the future. Following Figure 10, several additional worksheets were developed in the course of the post-workshop review, including:

- Figure 11, Project Schedule Based on Revised "Blue Wall," Part 1 and Part 2, provide a more detailed timeline in Gantt Chart format, starting with projects that were in progress during the last quarter of FY 2016/17 and then continuing out through FY 2017/18, 2018/19, and 2019/20. This format provides a clearer view of the overall timelines for groups of projects (including projects related to the Land Management System Implementation, Munis Finance Enhancements, Munis HR Enhancements, and the Asset Management System Enhancements). This schedule should be regarded as a "straw man" and modified as needed to conform to the City's priorities and resources

  The projects are listed in Figure 11 alphabetically by project sponsor and project name, with the following information:

  - Concurrent Projects per Quarter: Provides a count of the number of projects for whom activities have been scheduled in that quarter and provides a general indication of the resource requirements
  - 2017 ITSP Status: Provides the status of the project. Projects are classified as being "in-progress" or "planned" unless they have not been scheduled, in which case the project status in shown as "pending"
  - Business Impact: Provides an estimate of the projects impact on City operations (high, medium, and low)
  - Level of Effort: Provides an estimate of the level of effort (considering both user and IT resources) to implement the project (high. medium, low)
  - Level of Risk: Provides an assessment of the potential of the project to disrupt City operations (high, medium, low)
- Figure 12, Estimated Mid-Range Cost by Fiscal Year, Parts 1 and 2, provide an estimate of the cost for each fiscal year based on the mid-range cost for each of the projects identified in Figure 11, Project Schedule Based on Revised "Blue Wall," Parts 1 and 2. Please note that:
  - The full cost for a project is considered to incurred at the outset of the project, even if its duration continues into subsequent fiscal years
  - Known recurring costs per fiscal year (usually software maintenance and license fees) are shown
  - Costs for projects that will be based on "Software-as-a-Service" (i.e., cloud-based subscriptions) are noted as TBD since these costs can vary widely depending on the service selected
- Figure 13, IT Infrastructure Projects and Schedule, Parts 1 and 2, provide a schedule and costs for the implementation of a series of IT infrastructure projects that impact the ability of ITD to support the strategic projects identified in Figures 10 and 11, as well as to ensure that the City's information technology infrastructure remains highly available and secured. Figure 12 provides information for each IT infrastructure project including:
  - The estimated implementation time frame

- The estimated low and high costs in 000's
- The level of effort and the level of risk for each project (high, medium, low)
- The estimated cost per fiscal year based on the estimate mid-range cost for each project (the mid-range cost is an average of each projects estimated low and high costs)

Table 2, Total Estimated Spending, FY 2017/18 through FY 2020/21, provides a summary of the estimated costs for the strategic operational and IT projects identified in Figure 11 and the IT infrastructure projects identified in Figure 12.

Table 2, Total Estimated Spending, FY 2017/18 through FY 2020/21

	Cost Per Fiscal Year					
Category	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	Unscheduled	Total
Strategic Operational and IT Projects:	$ 488.83	$ 556.33	$ 468.83	$0	$ 97.50	$ 1,611.50
IT Infrastructure Projects:	$ 1,246.00	$ 1,512.00	$ 183.00	$ 234.00	$0	$ 3,175.00
Total:	$ 1,734.83	$ 2,068.33	$ 651.83	$ 234.00	$ 97.50	$ 4,786.50

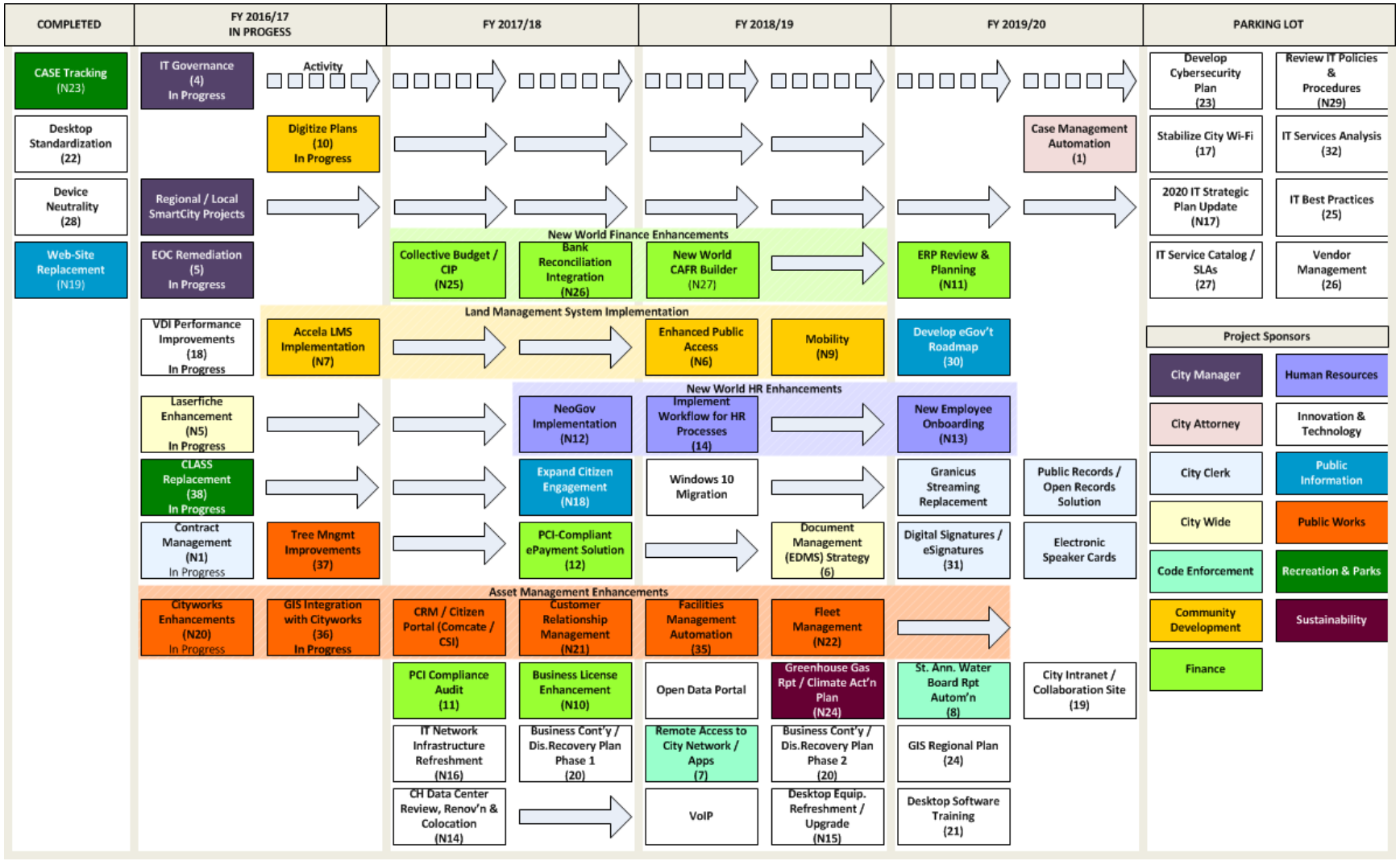

Figure 10 – "Blue Wall" Following Post Workshop Review

Project	Sponsor	2017 ITSP Status	Business Impact	Level of Effort	Level of Risk	Estimated Costs ($000's) Low	Estimated Costs ($000's) High	Fiscal Years 2016/2017 Q3	2016/2017 Q4	2017/18 Q1	2017/18 Q2	2017/18 Q3	2017/18 Q4	2018/19 Q1	2018/19 Q2	2018/19 Q3	2018/19 Q4	2019/20 Q1	2019/20 Q2	2019/20 Q3	2019/20 Q4
OPERATIONAL PROJECTS						Concurrent Projects By Quarter			11	12	10	11	12	11	9	11	11	10	9	4	4
Emergency Operations Center (EOC) Remediation	City Manager	In Progress	H	M	L	n/a	n/a		■												
IT Governance (Continuing Activity)	City Manager	In Progress	H	L	L	n/a	n/a		■	■	■	■	■	■	■	■	■	■	■	■	■
Regional / Local Smart City Initiatives	City Manager	In Progress	H	M	M	n/a	n/a		■	■	■	■	■	■	■	■	■	■	■	■	■
Laserfiche Enhancement	City-wide	In Progress	H	M	M	n/a	n/a		■	■	■										
Electronic Document Management System (EDMS) Strategy	City-wide	Planned	H	M	L	$ -	$ 25									■	■				
Case Management Automation	City Attorney	Planned	H	M	L	$ 25	$ 40													■	■
Contract Management	City Clerk	In Progress	H	M	M	n/a	n/a		■	■	■										
Digital Signatures / eSignatures	City Clerk	Planned	H	M	L	$ 25	$ 40											■	■		
Electronic Speaker Card	City Clerk	Planned	H	L	L	$ 25	$ 40									■	■				
Granicus Streaming Replacement	City Clerk	Planned	M	M	L	$ 50	$ 75											■	■		
Public Records / Open Records Solutions	City Clerk	Planned	M	M	L	$ 35	$ 50													■	■
Remote Access to City Network and Applications	Code Enforcement	Planned	H	M	M	$ 25	$ 35						■	■							
State Annual Water Board Rpt Consolidation / Automation	Code Enforcement	Planned	H	M	L	$ -	$ 25									■	■				
Land Management System Implementation									■	■	■	■	■	■	■	■	■				
Accela LMS Implementation	Comm. Dev.	In Progress	H	M	L	n/a	n/a		■	■	■	■	■								
Enhanced Public Access	Comm. Dev.	Planned	H	M	M	$ 25	$ 40							■	■						
Mobility	Comm. Dev.	Planned	H	M	M	$ 25	$ 40									■	■				
Digitize Plans	Comm. Dev.	In Progress	H	M	L	n/a	n/a		■	■	■	■	■	■	■	■	■				
Class Replacement / Active.NET Implementation	Recreation	In Progress	H	M	M	n/a	n/a		■	■	■										
New World Finance Enhancements										■	■	■	■	■	■	■	■	■	■		
Collective Budget / CIP	Finance	Planned	H	H	M	$ 5	$ 10			■	■										
Bank Reconciliation Integration	Finance	Planned	H	H	M	$ 5	$ 10					■	■								
New World CAFR Builder	Finance	Planned	H	H	M	$ 5	$ 10							■	■	■	■				
ERP Review and Planning	Finance	Planned	H	M	L	$ 5	$ 10											■	■		
Business License Enhancement	Finance	Planned	H	M	M	$ 10	$ 15					■	■								
PCI Compliance Audit	Finance	Planned	H	M	L	$ -	$ 18			■				■				■			
PCI Compliant e-Payment Solution	Finance	Planned	H	M	M	$ 10	$ 15					■	■								
New World HR Enhacements											■	■	■	■	■	■	■	■	■		
Implement Workflow for HR processes	HR	Planned	H	M	M	$ 35	$ 50					■	■	■	■						
NeoGov Implementation	HR	Planned	H	M	L	$ -	$ 15									■	■				
New Employee Onboarding	HR	Planned	H	M	L	$ -	$ 15											■	■		
Develop e-Government Roadmap	Public Information	Planned	H	M	L	$ -	$ 10											■	■		
Expand Citizen Engagement	Public Information	Planned	H	M	L	$ 25	$ 40					■	■								
Tree Management Improvements	Public Works, Planning	In Progress	H	M	L	n/a	n/a														

Figure 11 – Project Schedule Based on Revised "Blue Wall," Part 1

Project	Sponsor	2017 ITSP Status	Business Impact	Level of Effort	Level of Risk	Estimated Costs ($000's) Low	Estimated Costs ($000's) High	Fiscal Years 2016/2017 Q3	2016/2017 Q4	2017/18 Q1	2017/18 Q2	2017/18 Q3	2017/18 Q4	2018/19 Q1	2018/19 Q2	2018/19 Q3	2018/19 Q4	2019/20 Q1	2019/20 Q2	2019/20 Q3	2019/20 Q4
Asset Management Enhancements																					
Cityworks Enhancements	Public Works	In Progress	H	H	L	n/a	n/a		■												
GIS Integration with Cityworks	Public Works	In Progress	H	M	L	n/a	n/a		■												
CRM / Citizen Portal (Comcate / CSI)	Public Works	Planned	H	M	M	$ 25	$ 40			■	■										
Customer Relationship Management (CRM)	Public Works	Planned	H	H	M	$ 25	$ 40					■	■								
Facilities Management Automation	Public Works	Planned	H	H	M	$ 10	$ 15							■	■						
Fleet and Fuel Management	Public Works	Planned	H	M	M	$ 15	$ 30									■	■	■	■		
Portal for Greenhouse Gas Rpt & Climate Act'n Plan	Sustainability	Planned	H	M	L	$ 25	$ 40							■	■						
INNOVATION & TECHNOLOGY																					
Business Continuity and D/R Plan	ITD	Planned	H	M	L	$ -	$ 25					■	■								
City Hall Data Center Review, Renovation, and Colocation	ITD	Planned	H	M	M	$ 35	$ 50			■	■										
City Intranet/Collaboration Site	ITD	Planned	H	M	L	$ 15	$ 35											■	■		
Desktop Equipment Refreshment / Upgrade	ITD	Planned	H	M	L	$ 650	$ 750					■	■			■	■			■	■
Desktop Software Training	ITD	Planned	H	M	L	$ -	$ 25											■	■		
GIS Regional Plan	ITD	Planned	H	M	L	$ 25	$ 40									■	■				
IT Network Infrastructure Refreshment	ITD	Planned	M	M	M	n/a	n/a			■	■										
Open Data Portal	ITD	Planned	M	M	L	$ 35	$ 50							■	■						
Windows 10 Migration	ITD	Planned	M	H	L	$ 25	$ 40							■	■						
VDI Performance Improvements	ITD	In Progress	H	M	L	n/a	n/a		■	■											
PROJECTS NOT SCHEDULED																					
Develop Cybersecurity Plan	ITD	Pending	H	M	L	$ -	$ 25														
IT Best Practices	ITD	Pending	M	M	L	$ -	$ 15														
IT Policies and Procedures	ITD	Pending	M	M	L	$ -	$ -														
IT Services Analysis	ITD	Pending	M	M	L	$ -	$ 25														
IT Service Catalog / SLAs	ITD	Pending	H	M	L	$ -	$ 15														
IT Strategic Plan Update - 2020	ITD	Pending	M	M	L	$ -	$ 50														
Stabilize City Wi-Fi	ITD	Pending	H	M	L	$ -	$ 50														
Vendor Management	ITD	Pending	M	M	L	$ -	$ 15														

Figure 11 – Project Schedule Based on Revised "Blue Wall," Part 2

Project	Sponsor	2017 ITSP Status	Est'd Mid-Range Cost ($000's)	Cost per Fiscal Year ($000's)			
				2017/18	2018/19	2019/20	Unscheduled
OPERATIONAL PROJECTS							
Emergency Operations Center (EOC) Remediation	City Manager	In Progress	n/a				
IT Governance (Continuing Activity)	City Manager	In Progress	n/a				
Regional / Local Smart City Initiatives	City Manager	In Progress					
Laserfiche Enhancement	City-wide	In Progress	n/a				
Electronic Document Management System (EDMS) Strategy	City-wide	Planned	$ 13		$ 13		
Case Management Automation	City Attorney	Planned	$ 33			$ 33	
Contract Management	City Clerk	In Progress	n/a				
Digital Signatures / eSignatures	City Clerk	Planned	$ 33			$ 33	
Electronic Speaker Card	City Clerk	Planned	$ 33		$ 33		
Granicus Streaming Replacement	City Clerk	Planned	$ 63			$ 63	
Public Records / Open Records Solutions	City Clerk	Planned	$ 43			$ 43	
Remote Access to City Network and Applications	Code Enforcement	Planned	$ 30	$ 30			
State Annual Water Board Rpt Consolidation / Automation	Code Enforcement	Planned	$ 13		$ 13		
Land Management System Implementation							
Accela LMS Implementation	Comm. Dev.	In Progress	n/a				
Enhanced Public Access	Comm. Dev.	Planned	$ 32.50		$ 32.50		
Mobility	Comm. Dev.	Planned	$ 32.50		$ 32.50		
Digitize Plans	Comm. Dev.	In Progress	n/a				
Class Replacement / Active.NET Implementation	Recreation	In Progress	n/a				
New World Finance Enhancements							
Collective Budget / CIP	Finance	Planned	$ 8	$ 8			
Bank Reconciliation Integration	Finance	Planned	$ 8	$ 8			
New World CAFR Builder	Finance	Planned	$ 8		$ 8		
ERP Review and Planning	Finance	Planned	$ 8		$ 8		
Business License Enhancement	Finance	Planned	$ 13			$ 13	
PCI Compliance Audit	Finance	Planned	$ 9	$ 3	$ 3	$ 3	
PCI Compliant e-Payment Solution	Finance	Planned	$ 13	$ 13			
New World HR Enhacements							
Implement Workflow for HR processes	HR	Planned	$ 43	$ 43			
NeoGov Implementation	HR	Planned	$ 8		$ 8		
New Employee Onboarding	HR	Planned	$ 8			$ 8	
Develop e-Government Roadmap	Public Information	Planned	$ 5			$ 5	
Expand Citizen Engagement	Public Information	Planned	$ 33	$ 33			
Tree Management Improvements	Public Works, Planning	In Progress	n/a				

Figure 12 – Estimated Mid-Range Cost per Fiscal Year for Revised "Blue Wall," Project, Part 1

Project	Sponsor	2017 ITSP Status	Est'd Mid-Range Cost ($000's)	Cost per Fiscal Year ($000's)			
				2017/18	2018/19	2019/20	Unscheduled
Asset Management Enhancements							
Cityworks Enhancements	Public Works	In Progress	n/a				
GIS Integration with Cityworks	Public Works	In Progress	n/a				
CRM / Citizen Portal (Comcate / CSI)	Public Works	Planned	$ 33	$ 33			
Customer Relationship Management (CRM)	Public Works	Planned	$ 33	$ 33			
Facilities Management Automation	Public Works	Planned	$ 13		$ 13		
Fleet and Fuel Management	Public Works	Planned	$ 23		$ 23		
Portal for Greenhouse Gas Rpt & Climate Act'n Plan	Sustainability	Planned	$ 33		$ 33		
INNOVATION & TECHNOLOGY							
Business Continuity and D/R Plan	ITD	Planned	$ 13	$ 13			
City Hall Data Center Review, Renovation, and Colocation	ITD	Planned	$ 43	$ 43			
City Intranet/Collaboration Site	ITD	Planned	$ 25			$ 25	
Desktop Equipment Refreshment / Upgrade	ITD	Planned	$ 700	$ 233.33	$ 233.33	$ 233.33	
Desktop Software Training	ITD	Planned	$ 13			$ 13	
GIS Regional Plan	ITD	Planned	$ 33		$ 33		
IT Network Infrastructure Refreshment	ITD	Planned	n/a				
Open Data Portal	ITD	Planned	$ 43		$ 43		
Windows 10 Migration	ITD	Planned	$ 33		$ 33		
VDI Performance Improvements	ITD	In Progress	n/a				
PROJECTS NOT SCHEDULED							
Develop Cybersecurity Plan	ITD	Pending	$ 13				$ 13
IT Best Practices	ITD	Pending	$ 8				$ 8
IT Policies and Procedures	ITD	Pending	$ -				$ -
IT Services Analysis	ITD	Pending	$ 13				$ 13
IT Service Catalog / SLAs	ITD	Pending	$ 8				$ 8
IT Strategic Plan Update - 2020	ITD	Pending	$ 25				$ 25
Stabilize City Wi-Fi	ITD	Pending	$ 25				$ 25
Vendor Management	ITD	Pending	$ 8				$ 8
		TOTAL:	**$ 1,611.50**	**$ 488.83**	**$ 556.33**	**$ 468.83**	**$ 97.50**

Figure 12 – Estimated Mid-Range Cost per Fiscal Year for Revised "Blue Wall," Project, Part 2

Project	Implementation Time Frame				Estimated Cost ($000's)		Level of Effort	Level of Risk	Mid-Range Cost by FY ($000's)			
	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	Low	High			FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Cellular Coverage/Capacity Survery	■	■			$ -	$ 15	L	L				
Change Management - Exercise/Test	■	■	■		$ -	$ -	L	L				
Staffing	■	■	■	■	$ 100	$ 400	M	L	$ 250			
Centralize IT Expenditures	■				$ -	$ -	M	L	$ -			
City Hall - Data Center - Review	■				$ -	$ -	M	L				
Email Retention	■				$ -	$ 15	M	L				
IT Chargeback Methodology	■				$ -	$ 25	M	L				
IT Policy Review/Modify/Create	■				$ -	$ -	M	L				
Education Roadmap for staff	■				$ -	$ 15	M	L				
Performance Measures	■				$ -	$ 15	M	L				
Small Cell	■				$ -	$ 25	M	L				
Assume iPad/Cell Phone Responsibility		■			$ -	$ -	M	L				
Colocation/DR Site		■			$ -	$ 100	M	L				
Develop Cloud Strategy		■			$ -	$ 25	M	L				
Mobile Applications (city-wide)	■	■	■		$ 10	$ 15	M	M				
WAZE	■	■			$ -	$ 15	L	L				
Application Architecture - Development		■			$ -	$ 25	M	L				
PMO Development	■				$ -	$ 25	M	L				
Replacement for DropBox		■			$ -	$ 35	M	L				
Splunk - Data Analytics - Prep for IOT		■	■		$ -	$ 125	M	L				
RFP Website - Know who downloads what		■			$ 25	$ 40	M	L				
GIS Strategic Plan - Work Items	■	■	■		$ -	$ -	M	M				
GIS 3D Projection	■				$ -	$ -	M	L				
GIS Aerial/Lidar	■			■	$ -	$ 50	M	L				
GIS Story Boards		■	■		$ -	$ -	M	L				
Desktop - Tech Refresh	■	■	■	■	$ 300	$ 345	M	M	$ 323	$ 323	$ 323	$ 323
Penetration Testing	■	■	■	■	$ 25	$ 40	M	L	$ 33			
User Security Awareness Training	■	■	■	■	$ 6	$ 10	M	L	$ 8			
UPS - Tech Refresh / Expansion	■	■	■	■	$ 50	$ 65	M	L	$ 58			

Figure 13, IT Infrastructure Projects and Schedule, Part 1

Project	Implementation Time Frame				Estimated Cost ($000's)		Level of Effort	Level of Risk	Mid-Range Cost by FY ($000's)			
	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	Low	High			FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Core + Edge - Tech Refresh	■				$ 100	$ 150	M	M	$ 125			
Endpoint Protection	■				$ 50	$ 75	M	M	$ 63			
Managed SIEM	■				$ 25	$ 35	M	L	$ 30	$ 30	$ 30	$ 30
Video Storage Replication	■				$ 100	$ 150	M	L	$ 125			
WAN Link Upgrade	■				$ 25	$ 35	M	M	$ 30			
Firewall - Tech Refresh		■			$ 100	$ 150	M	M		$ 125		
Hyperconverged - Phase II (Will lead to D/R) - ship out		■			$ 150	$ 175	M	L		$ 163		
Windows 10 (Phases)		■			$ 35	$ 50	M	L		$ 43		
EOC - Tech Refresh		■			$ 225	$ 275	M	M		$ 250		
iPad/Cell Phone - Tech Refresh		■	■		$ 75	$ 100	M	L		$ 88		
MFP - Tech Refresh		■	■		$ 80	$ 95	M	L		$ 88		
VOIP		■			$ 300	$ 350	M	L		$ 325		
City Supplied Fiber - Feasibility Study		■			$ -	$ 25	M	L		$ 13		
Expand Fiber Connectivity - City Facilities (TICC priority)		■	■		$ -	$ 150	M	L		$ 75		
Mobile Data Management	■				$ 5	$ 10	M	L	$ 8			
CATDV	■	■			$ 50	$ 75	M	L	$ 63			
Community Hall - Tech Refresh	■				$ 50	$ 75	M	L	$ 63			
Control Room - Tech Refresh	■				$ 50	$ 75	M	M	$ 63			
Flypack	■				$ 6	$ 18	M	L	$ 12			
Media Encoder - Tech Refresh	■				$ 100	$ 150	M	M	$ 125			
Radio Cupertino - Tech Refresh	■				$ 100	$ 150	M	M	$ 125			
Drone		■			$ 75	$ 100	M	L		$ 88		
Conference Rooms - Tech Refresh		■			$ 50	$ 75	M	L		$ 63		
O365 - Office (Office 365 U.S. Government Community G3)		■			$ 51	$ 204	H	M	$ 51	$ 102	$ 153	$ 204
Collaborative Tools - MS Groups & Planner		■			n/a	n/a						
Fiber Expansion (City Hall - Service Yard)		■			$ 50	$ 75	M	L		$ 63		
									$ 1,569	$ 1,835	$ 506	$ 557

Figure 13, IT Infrastructure Projects and Schedule, Part 2

Section 5 – Conclusion

> **"The role of IT in many organizations has evolved from supporting the business to enabling the business — a shift that requires IT to transition from being mostly tactical and cost focused to being an enabler of the [organization's] overall strategy and value focused."** - "Creating A Culture of Performance and Value," Forrester Research

In the conclusion to the 2015 IT Strategic Plan, NexLevel focused on three thoughts that have emerged in the course of developing the IT strategic plan for the City of Cupertino, including the need for:

- A commitment to information technology governance as a process to ensure the alignment of the use of the City's information technology resources with its business objectives and priorities and to facilitate changes in how the City uses information technology
- A well-balanced, robust, and reliable information technology infrastructure as the foundation for obtaining greater value from the City's investments in IT
- A commitment to IT strategic planning as a continuing process rather than as a one-time or ad-hoc activity

Those thoughts remain relevant today and have been joined by the need for the City's Innovation & Technology Department to increasingly focus on becoming a service broker that can assist the City's user community in identifying services that can meet their needs and finding the most effective service provider from the available options, as well as being an effective service provider.

Figure 14, IT Service Delivery Options, depicts the factors that are driving the need for increased agility, the central role of IT governance in evaluating how best to obtain services to support business needs, and the role of the IT organization in the process. Gartner Research, a leading information technology research firm, has defined agility as "the ability of an organization to sense environmental change and respond efficiently and effectively to that change."[12] Gartner also noted that "It is not shocking that enterprises want to be agile. What is shocking is that very few of them know what it means to be agile… Sensing the need for change also includes the proactive initiation of change."

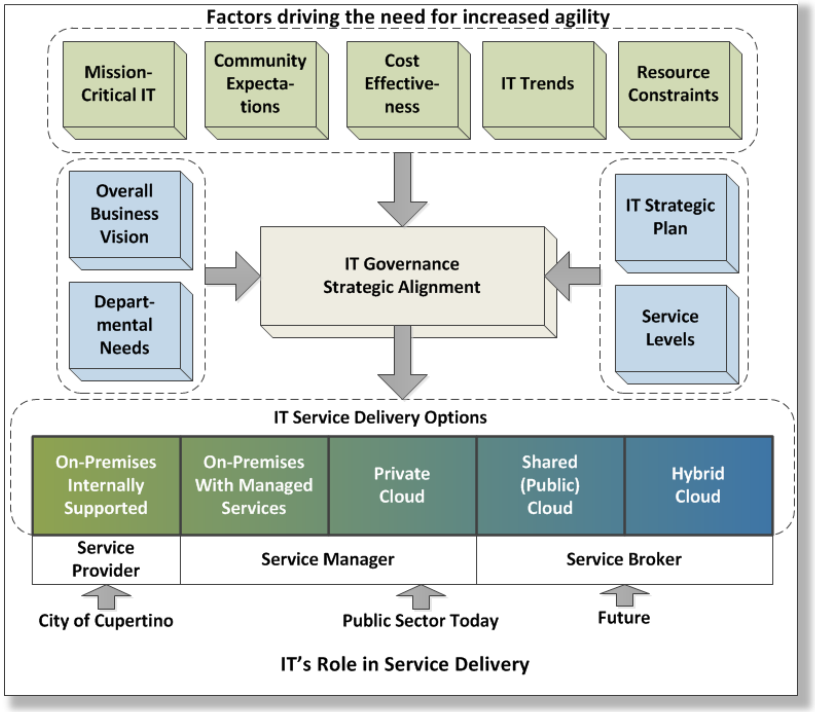

Figure 14 – IT Service Delivery Options

[12] "Defining, Cultivating and Measuring Enterprise Agility," Gartner Research

NexLevel's view is that IT governance is a key enabler of organizational agility that enables organizations to effectively utilize their information technology assets (technologies, applications, and people) to proactively respond to change in a manner that is consistent with their business vision, objectives, and needs as well as the user and IT resources available. Resources are often the most critical constraint, since organizations seldom have sufficient resources to meet current operational commitments and to respond to change.

Until recently, those resources were primarily internal – internal staff members, on-premises IT infrastructure, and COTS business applications that were hosted locally. The availability of cloud-based services, including cloud-based infrastructure and business applications, have increased the number of options available to organizations and enable organizations to accomplish more while limiting the growth in the number of IT staff resources required to manage and support the IT environment.

One of the misconceptions of the cloud environment is that it reduces the need for internal IT resources when, in fact, it transforms the need for IT resources from staff members whose competencies are technology-focused (such as system administrators) to staff members who can manage projects, manage multiple vendor relationships, and assist the users in obtaining greater value for their investments in information technology through activities such as business analysis and business process re-engineering.

Organizations seeking to adopt cloud-services often find themselves in a "painful meanwhile" where they need to maintain existing on-premises information technology infrastructure as well as manage the move to the cloud and adapt to the challenges of the cloud environment. As a result, IT expenditures and staffing requirements might actually increase for the duration of the migration. The end-state for many organizations is are hybrid IT environments where some components of the environments (generally, the network and some servers) remain on-premises and supported by local IT staff while other components (typically business applications) are hosted in the cloud and supported by external service providers. At times, some organizations may elect to have applications that are hosted in the cloud but managed by local IT staff members.

These organizations find that the management of multiple cloud-services and their contracts can be challenging. Apart from administration, cloud services are continuing to evolve and organizations need to periodically review their sourcing arrangements to make sure that the deals they have are competitive with current offerings and meeting their needs.

Organizations that are confronted with choosing between multiple IT service delivery options, with each of the options having different advantages and disadvantages, often struggle to find the best long-term path. The development and maintenance of a coherent vision and strategy for the delivery of information technology services can make this process easier and enable organizations to develop momentum and to cumulatively build value for their investments in information technology.

On the other hand, if the strategy is not maintained and appropriately executed (through IT governance), organizations find that they are continually at the beginning of the strategy implementation process, with no apparent end in sight, with escalating costs and little demonstrated value for these investments.

Appendices

Appendix A – Project Portfolio

The City of Cupertino
2017 IT Strategic Plan Update
Projects Sorted by Sponsor and Project Name

Project ID: "N" denotes a new project that was identified in the course of the 2017 ITSP Update
Project Status Definitions: Complete=Project objectives met; Cancelled=Sponsor does not see current need for project; In Progress=Project is budgeted, staffed, and being worked on; Planned=Project planned for completion at a later date; Proposed=Project has been proposed but has not yet been budgeted or scheduled

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
1	Case Management Automation	City Attorney		Proposed		Proposed	Procure and implement a case management system that would enable the City Attorney to track the status of legal matters and events related to these matters including the referral of work to outside counsel, and the capability to track Court appearances, depositions, etc. for the City.
2	e-Discovery (Public Records Act Requests Automation)	City Attorney		Proposed		Cancelled	Evaluate, procure, and implement e-Discovery software which will help manage and produce public information including email, contracts and other forms of digital documentation. Analytics search features allow for word list usage, exact phrase matching, forbidden term searching and approximate spelling matching. This project may be a part of the implementation of an Electronic Document Management Solution (EDMS). **2017 Update:** Project status changed to Cancelled.
N1	Contract Management	City Clerk	All, esp: Public Works	N/A		Proposed	The City has licensed the Contract module for New World but only one person in Public Works is using it at the present time. With the acquisition of Laserfiche Rio, Contract management will be the first application in the City to utilize both forms and workflow.

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
31	Digital Signatures / eSignatures	City Clerk	Community Development Public Works	Planned	Jun-2017	Proposed	Develop plan for and implement capabilities to support the use of digital signatures / e-signatures for public documents in conformance with California law. **2017 Update**: Could use at Public Works Counter - also for contracts, may be part of the portal for Magnet. Would be right at the top of list for PW.
N2	Electronic Speaker Card	City Clerk		N/A		Proposed	This project would provide for the procurement and implementation of an application that would enable members of the community to electronically file speaker cards to speak before the Council - it would also provide an electronic log for the Clerk so that speakers could be called up.
N3	PRA Tracking	City Clerk		N/A		Proposed	The number of PRA's submitted to the City has tripled in recent years
3	Develop SmartCity Vision / Blueprint	City Council / TICC	All	Proposed		Proposed	Develop plan that would provide for the wider adoption of information technology to facilitate citizen access to information and services including public recreation and education, transportation, and greater access to wired broadband and wireless services. **2017 Update**: The City has joined a regional Smart City program; however, the need for a blueprint for local initiatives related to the implementation of Smart City capabilities remains a priority for the City.
5	Emergency Operations Center (EOC) Remediation	City Manager		Proposed		In Progress	The City's current EOC does not meet requirements for an emergency operations / command / communications center. This project would provide for the interim relocation of the EOC to a facility outside of City Hall and the development of a long-term plan for a permanent EOC for the City.

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
4	IT Governance	City Manager	All	Planned	Jun-2017	In Progress	Define and create a formal City-wide IT governance structure which will assist in aligning the business needs of the City with the technology support organization. Activities include: - Creation of a charter for the IT Governance Committee and any needed sub-committees - Member selection - Meeting agendas and schedule This project would provide the City with established processes for the acquisition and implementation of technology, improve communication about technology projects, provide for organization-wide input into technology decisions, and establish the process for prioritization of technology needs. It would also include development of formal policies relating to technology. A properly executed IT Governance structure will improve communications, add transparency among departments utilizing technology and provide a forum for structured technology implementation.
N4	Business Intelligence / Analytics Pilot	City-wide	All	N/A		Proposed	This project would provide for the acquisition and implementation to support Business Intelligence (BI) and Business Analysis (BA) capabilities for the City that would enable the City to leverage existing data as well as future data sources (IoT) to monitor performance, measure outcomes, and to analyze trends. In addition to the acquisition of software tools, professional services will also be required to assist the City ind the development of data architecture to support the use of the tools and review of the project to establish objectives and priorities for future phases.

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
6	Electronic Document Management System (EDMS) Strategy	City-wide	All departments - esp. important to: City Clerk Recreation	Proposed		Proposed	Develop and implement a formal strategy for City-wide document and content management Benefits of the wider implementation of an document and content management capabilities include: - A single repository for storage management and search ability of archived documents for both internal and public search functions as well as reducing the City-wide inconsistencies in document storage, management, and retention - Reducing physical storage requirements and management of paper in-house or off-site Improved searching of archived documents for both internal and public search functions with full integration with other departmental based software applications **2017 Update**: Please see Project N5. The City is working on a major expansion of the functionality provided by Laserfiche through an upgrade to a newer version. The development of the EDMS strategy should be considered following the completion of the upgrade.
N5	Laserfiche Enhancement	City-wide		N/A		In Progress	The City has procured a new version of Laserfiche with additional capabilities and will implement the new version in 2017.
7	Remote Access to City Network and Applications	Code Enforcement		Proposed		Proposed	Provide access to City intranet and applications for Code Enforcement personnel located off-site.
8	State Annual Water Board Report Consolidation and Automation	Code Enforcement		Proposed		Proposed	Analyze the current sources, tools and processes used to develop the Annual Water Board Report and identify opportunities to consolidate access and data and automate the process. Potential to leverage Citizen Serve to support this function.

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
9	CSI Magnet Implementation	Community Development	Public Works	In Progress	Jun-2017	Complete	In progress project to replace the current land management software (Community Plus and Pentamation) with CSI's Magnet products. **2017 Update:** Project has been completed – Community Development is now focused on the procurement of a new solution for planning / permitting.
10	Digitize Plans	Community Development	Public Works	Proposed / Continuing Effort		In Progress	This project supports the department's goal to become paperless and improve the storage, retrieval and accessibility by digitizing plans. Provide for the scanning and indexing of these documents in a format that would facilitate online retrieval and eventual archiving. The City may want to also want to include Public Works in the scope. **2017 Update**: This project is continuing.
N6	Enhanced Public Access	Community Development		N/A		Proposed	This project would provide enhance electronic filing and review capabilities to minimize the need to come to the public counter as well as an upgrade to the technology at the public counter including self-service kiosks, etc.
N7	Land Management System Evaluation	Community Development		N/A		In Progress	The City is presently evaluating land management solutions (including Accela and EnerGov) with the objective of selecting an application to replace CSI Magnet. Objectives of the evaluation include assessing the usability of the application, ability to support the City's business needs, the maturity of the product, and its ability to effectively integrate with GIS, Cityworks, Laserfiche, and Logos
N8	Land Management System Implementation	Community Development		N/A		Planned	Based on the results of the Land Management Evaluation, the City will select and procure a solution to replace CSI/Magnet. The effort to implement the solution will require the development of a detailed project plan and the allocation of City resources to support a range of activities including the re-engineering of business processes, the development of use cases to confirm requirements and to establish test cases, integration with GIS, Laserfiche, etc., installation and configuration of the solution, training, and various stages of testing.

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
N9	Mobility	Community Development		N/A		Proposed	This project would provide mobile access for the City's building inspectors with the ability to take electronic signatures and credit card payments (for on-site issuance of permits).
N10	Business License Enhancement	Finance		N/A		Proposed	Logos can presently handle the renewal of business licenses but not provide self-service functionality for initial applications. These are being handled manually and entered into Logos. This project would provide for an automated capability for the handling of both intitial requests and the renewal of business licenses.
N11	New World (ERP) Review and Planning	Finance	All	N/A		Proposed	The City has implemented Tyler's New World (formerly New World Logos) product for financial processing in 2015 but the users are of the opinion that not all of the functionality is being used and that some of the work-arounds adopted during implementation are still in place and are limiting the City's ability to obtain the fullest benefit from the application. This project would provide for conducting an evaluation of the implementation and the development of detailed plan for enhancing the current implementation and making greater use of Logos throughout the City. The plan will also need to provide a long-term vision for the City regarding the considerations of staying with Logos or moving to Munis (re: functionality, cost, and Tyler's future product directions for New World and Munis).
11	PCI Compliance Audit	Finance		Proposed		Proposed	This project would provide for the completion of a PCI (Payment Card Industry) Audit to ensure that the City and its CURRENT payment processing services are in compliance with current industry standards for the secure handling of credit card transactions.
12	PCI Compliant e-Payment Solution	Finance		Proposed		Proposed	This project would provide for the procurement and implementation of a highly secure, state of the art, PCI-compliant e-payment solution for the City that would be accessible by the public from mobile devices as well as from desktop computers

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
14	Implement Workflow for HR processes	HR		Proposed		Proposed	Review current HR process for workflow automation opportunities including onboarding/off boarding, performance evaluations and other processes. May be able to leverage New World System HR functionality and/or interfaces to New World System.
N12	NeoGov Implementation	HR	All	N/A		In Progress	The City has procured NeoGov for handling HR processes related to recruitment and selection - intent is to have NeoGov integrated with Logos
N13	New Employee Onboarding	HR		N/A		Proposed	In conjunction with the implementation of NeoGov and the HR module in Logos would provide automated support for the onboarding of new employees including workflows to ensure that all new hire documentation is completed and approved.
13	New World HR/Payroll Implementation	HR	All	In Progress	Jun-2017	Complete	In progress project to deploy New World's Finance, HR and Payroll systems. Scope includes eTimesheets. **2017 Update**: Implementation of Finance was completed but some issues remain, please see ERP Project in new projects.
15	Augment IT Resources	IT		Complete	Jun-2017	Complete	In progress project to augment the City's existing IT staff resources by bringing in an additional project manager / business analyst to assist Departments in the procurement and implementation of new technology projects.
N14	City Hall Data Center Review, Renovation, and Colocation	IT	All	N/A		Proposed	This project will involve conducting a review of the equipment in the data center at City Hall to identify components that are due for replacement including uninterruptable power supplies (UPS), storage arrays, and servers, developing a plan for refreshment, and executing the plan. This will ensure the availability and performance of the City's applications. As part of this project, IT will look at options for the colocation of components of the City's IT infrastructure to ensure the continued availability of applications in the event that the City Hall data center is disabled. This project would be conducted in phases beginning in FY 2017 and continuing through FY 2020.

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
19	City Intranet/Collaboration Site	IT	All, esp.: Public Works	Proposed		Proposed	Implement a software solution to promote department communication and coordination for projects and day-to-day City activities. The solution should provide a foundation for facilitating and sharing information for projects and initiatives. More specifically, the solution should support document sharing, document version tracking, central form repository, workflow, alerts / notifications, calendars, frequently asked questions, links, project sites, and task tracking.
20	Create Business Continuity and Disaster Recovery Plan	IT		Proposed		Proposed	Create and implement a City-wide Business Continuity Plan and an IT Disaster Recovery Plan that would help to ensure timely recovery of core applications in event of an unplanned event or outage based on business and operational imperatives. Implementation of the plans should include any hardware, software, off-site services, and training required to meet business and operational recovery requirements.
N15	Desktop Equipment Refreshment / Upgrade	IT	All	N/A		Proposed	The scope of this project includes the continuing replacement of desktop devices, laptops, etc., as they age and become more expensive to maintain, problematic, and less able to support newer applications. It is also anticipated that even if Microsoft continues support for Windows 7 through the FY 2019, that upgrades to the applications the City uses may require Windows 10 requiring the installation of Windows 10 on those devices that are still running Windows 7. Due to the differences between the two versions of Windows, user training will have to accompany the rollout of Windows 10.
21	Desktop Software Training	IT	All	Proposed		Proposed	Develop and implement a formal plan and curriculum to provide on-going user training for desktop applications. The City may consider out-sourcing training.
22	Desktop Standardization	IT	All	Proposed		Proposed	Develop and document desktop standards for the City (including VDI devices and traditional desktop PCs). Develop procedures to request exceptions and evaluating exceptions that deviate from the standard. The IT Governance Committee (if in place) or authorized City executive should review and approve deviations from the City-wide desktop standard.

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
23	Develop Cybersecurity Plan	IT	All	Proposed		Proposed	Contract with an independent, certified, firm to conduct an external network vulnerability and penetration test to identify security gaps and identify areas for improvement.
28	Device Neutrality	IT	Community	Planned	Jun-2017	Proposed	Develop plan to accommodate the use of, and support for, a wider range of mobile devices / browsers by both City staff and the public in obtaining access to City information and services. The City's web-site will need to be continually refreshed as newer and more capable devices come into service. **2017 Update:** The porting of the City's web-site to Vision Internet may accommodate many of these requirements.
24	GIS Regional Plan	IT	GIS User Community	Proposed		Proposed	Establish a GIS roadmap (a series of GIS recommendations) for the strategic expansion of the GIS application to identify requirements and priorites and to provide an opportunity for the GIS user community to help shape City's the long-term goals for the GIS program. **2017 Update**: The City completed a GIS Project Plan that met the objectives of the 2015 GIS Roadmap - this project has been revised to reflect the need to develop a plan for expanded regional cooperation and information sharing for GIS.
25	IT Best Practices	IT	All	Proposed		Proposed	Develop and implement a plan for the continued adoption of IT best practices to improve the delivery of services to the City's user community. Initial focus areas should include: - Customer Service - Technical Documentation - Project Management Standards - Technology Planning (Capacity Planning, Change Management, etc.) - Resource Management and Planning - Technology Refreshment
N16	IT Network Infrastructure Refreshment	IT	All	N/A		Proposed	The City will need to refresh components of the network to ensure performance, reliability, and security including core and edge switches and is projected for FY 2017.

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
29	IT Policies and Procedures	IT	All	Planned	Jun-2017	Proposed	Review all IT related policies and procedures and document in a standard format. Scope includes all policies and procedures governing the use of technology City-wide including, refreshment policies, retention policies including e-mail, building permits, etc., website policies, security and remote access policies, etc. This project includes the creation, monitoring, and enforcement of standards, best practices, and policy for all employees as well as vendors accessing City computer systems. Additional focus should be placed on employee refresher training and acknowledgement of policies and policy oversight by the IT Governance Committee.
32	IT Services Analysis	IT		Planned	Jun-2017	Cancelled	This project would provide for the development of a long-term for the sourcing of information technology services including the identification of: - Those services that provide high-value to the City, require knowledge of City operations and that can best be performed by City staff - Those services that are "utility" functions that can be best performed by external service providers **2017 Update:** The objectives of this projectr are being addressed on a continuing basis by IT.
N17	IT Strategic Plan Update	IT	All	N/A		Proposed	Update IT Strategic Plan in FY 2020.
16	Renovate Server Room / Cloud Migration	IT	All	Planned	Jun-2017	Cancelled	The City's main server room at City Hall needs to be renovated including ensuring that there is sufficient power, air condition, and stand-by power for all of the devices in the room, replacing the existing open server racks with cabinets that are braced against seismic shock, organizing and labelling cables, and improving room security including video monitoring and motion sensors. As an interim measure, the City may consider the relocation of the some of the servers from the present server room to another City facility or leased space in an external data center. **2017 Update**: Replaced by a new project with a more specific scope that includes the objectives of this project

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
17	Stabilize City Wi-Fi	IT	Recreation	Planned	Jun-2017	Proposed	This project would provide for a complete analysis of the problems with wireless signal strength and propagation in City Hall and the Council Chambers and the completion of measures to improve the strength and quality of the wireless network, especially in the City Council Chamber. **2017 Update**: This is also a priority for Recreation and Community Services which has experienced problems with wireless connectivity at Quinlan Community Center, the Senior Center, Sports Center, and McClelland Ranch Preserve.
18	VDI Performance Improvements	IT	All VDI users, esp. Public Works	Planned		In Progress	This project would provide for the engagement of a technology firm to diagnose the problems being experienced with the implementation of virtual desktop infrastructure (VDI) devices and to develop and implement recommendations to enable the City to obtain the intended benefits of the VDI implementation. **2017 Update:** IT has developed and implemented an interim solution to improve VID performance that includes providing remote users with laptops.
26	Vendor Management	IT	All	Proposed		Proposed	Establish a series of processes to monitor, control, and manage external vendors used by ITD including: - Formal external vendor procedures - Vendor listing with demographic information - Service Catalog with service levels - Consolidation of maintenance contracts
27	IT Service Catalog / SLAs	IT	All	Proposed		Proposed	Develop and publish an IT Service Catalog that defines the services provided by ITD and the service levels associated with each of the services. Development of the catalog should consider the City's desired services and service levels vs. the City's current service delivery capabilities.
30	Develop e-Government Roadmap	Public Information	All	In Progress	Jun-2016	Proposed	Develop roadmap for community engagement that considers the respective roles of the City's web-site and other channels (such as social media) for the delivery of City information and services to the public. The roadmap could result in the identification of additional projects.

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
N18	Expand Citizen Engagement (Peak Democracy)	Public Information	All	N/A		Proposed	Acquire and implement "Open Town Hall" on-line community engagement platform.
N19	Web-Site Replacement / Granicus	Public Information	All, esp. City Clerk	N/A		In Progress	The City's web-site is being ported from the current platform to Vision Internet, web-site content is being reviewed and updated. This project would also include the further integration of Granicus with the City's web-site to make meeting information more readily available to the community.
33	Bid Tracking Automation	Public Works		Proposed		Proposed	Procure and implement a product to track and manage the bid process. This project may consider leveraging or integrating with the New World system that is currently in the process of being rolled out for HR.
N20	Cityworks Enhancements	Public Works		N/A		Proposed	Implement Storeroom and Analytics capabilities for Cityworks.
34	CRM / Citizen Portal (Comcate / CSI)	Public Works		Proposed		Proposed	Provide data to public for analysis (i.e. GIS - attach video and images and make available to public) and other initiatives to engage and inform citizens (may need to identify specific projects). **2017 Update:** Priority for PW - Have CRM and Cityworks talking to each other - need reports related to performance measures and handshake with GIS.
N21	Customer Relationship Management (CRM)	Public Works	City Manager Community Development Public Information Recreation	N/A		Proposed	This project is related to the acquisition and implementation of an automated CRM solution that receive, route, and track requests and/or problem reports from the City's community to the appropriate department(s), and provide the ability for the person making the report to follow the status of the item and provide notifications for persons who have registered to receive updates.
35	Facilities Management Automation	Public Works		Proposed		Proposed	Procure and implement a facilities management solution. **2017 Update**: PW is performing an audit of City facilities, so this might be a good time to consider an automated approach to facilities management. PW has utility management software, and the facilities management solution would need to work along with security cameras and key card access

Project ID	Project Name	Sponsor	Impacted Departments	2015 ITSP Project Status	2015 ITSP Est'd Completion	2017 ITSP Update Project Status	Description / 2017 Update for 2015 ITSP Projects
N22	Fleet Management	Public Works		N/A		Proposed	This project would provide for the procurement and implementation of an application that would support fleet management functions for Public Works and that would be integrated with Logos for cost accounting.
36	GIS Integration with Cityworks	Public Works		Proposed		In Progress	This project would provide for the integration of GIS with Cityworks to improve the ability of the City to manage and maintain critical infrastructure
37	Tree Management Improvements (between Public Works and Planning)	Public Works		Proposed		In Progress	Analyze the tree management process between Planning and Public Works and develop processes and/or technologies to better coordinate management of public vs. private trees. **2017 Update:** In progress, this functionality is being provided in a GIS layer.
N23	CASE Tracking	Recreation		N/A		In Progress	This project is related to the acquisition and implementation of an automated solution to support case management for senior residents.
38	Class Replacement ~~PerfectMind Implementation~~	Recreation		In Progress	Nov-2017	In Progress	In progress project to procure and implement registration software for Parks and Recreation to replace the current Class system that is at the end of vendor support. **2017 Update:** Recreation had selected PerfectMind as the replacement for Class, but has decided to pursue other options.
39	Implement Apple Pay	Recreation		In Progress	Nov-2017	Cancelled	Provide Apple Pay as another channel for Citizens to pay for City services. **2017 Update**: The replacement for Class will provide this capability for Recreation.
N24	Portal for Greenhouse Gas Report and Climate Action Plan	Sustainability		N/A		Proposed	The City needs to integrate data from both internal and external sources to complete the Greenhouse Gas Report and Climate Action Plan and would like to publish the report through the City's web-site and provide something more than a PDF. The internal data tends to be more detailed.

Appendix B – IT Best Practices Checklist

The IT Best Practices Checklist provides a tool to assess conformance to IT best practices. The IT best practices model is divided into six dimensions (IT Governance, Service Delivery, Business Applications Management, Infrastructure, Security / Information Protection, and IT Administration) with ten assessment factors in each dimension.

Conformance to the best practices is scored on the following basis:

- Y = The City is fully conformant to the IT best practice and these are scored at 3 points
- O = The City is either substantially conformant to the best practice (2 points) or minimally conformant to the best practice (1 point)
- N = The City is not conformant to the best practice at all (0 points)

For each assessment factor, the checklist provides the results of the 2015 assessment and the results of the 2017 assessment along with notes from the City and from NexLevel's review of the assessment.

Nbr	Dimension / Category	Best Practice Factor	IT Best Practice Conformance				Comments (NL = Comment from NexLevel)
			2015		2017		
			Yes, No, Other	Score	Yes, No, Other	Score	
1 - Information Technology Governance							
1	IT Oversight	Does the City have a defined IT Governance process?	N	0	O	2	Informal process agreed to by Senior Mgt team.
2	IT Oversight	Does the IT Governance Committee meet regularly?	N	0	O	2	CTO meets as needed with CM and Administration Director on IT Governance items.
3	IT Oversight	Does the City have Steering Committees for individual projects or applications?	Y	2	O	2	TICC reviews and provides guidance for IT Projects
4	IT Oversight	Are the City's policy makers and senior executives involved in making technology decisions?	Y	2	Y	3	
5	Strategic Business Plan	Does the City have a strategic business plan?	N	0	N	0	

Nbr	Dimension / Category	Best Practice Factor	IT Best Practice Conformance 2015 Yes, No, Other	2015 Score	2017 Yes, No, Other	2017 Score	Comments (NL = Comment from NexLevel)
6	IT Oversight	If the City has decentralized applications (primarily under the control of User Departments) are there formal procedures to ensure their conformity with standards and best practices?	N	0	N/A		During FY17 all enterprise applications were moved under the control of Innovation & Technology
7	Digital Government Strategy	Does the City have a web site? If so, what citizen-facing functions are provided (please note in comments field)?	Y	2	Y	3	
8	Digital Government Strategy	Does the City have a formal Digital Government / Community Engagement Strategy?	N	0	O	1	Innovation & Technology staff works under the direction of the PIO for these items.
9	Enterprise Project Management	Does the IT organization have project management processes and standards?	Y	1	O	1	
10	Enterprise Project Management	Are project charters developed for each major project?	N	0	N	0	
2 - Service Delivery							
1	Help Desk	Is the Help Desk organized along functional or organizational lines and does it provide a single point of contact for user communities?	Y	1	Y	3	
2	Help Desk	Does Help Desk staffing include subject matter experts who can assist users with both application usage and technology issues?	N	0	O	2	Help Desk staff can resolve most technical issues and utilize the Applications group to resolve applications based issues.
3	Help Desk		Y	2			
4	Help Desk	Does the IT organization routinely analyze call data for trends, volume and escalation?	N	0	Y	3	
5	Help Desk	Does the Help Desk have a formal methodology to prioritize requests? Does the prioritization methodology include a formal escalation procedure?	N	0	O	1	Help Desk tickets are reviewed/prioritized daily by I&T management.
6	Help Desk	Does the IT organization centrally develop and manage desktop and server software images that ensure appropriate “lock down” of desktops?	Y	2	Y	3	

Nbr	Dimension / Category	Best Practice Factor	IT Best Practice Conformance 2015 Yes, No, Other	2015 Score	2017 Yes, No, Other	2017 Score	Comments (NL = Comment from NexLevel)
7	Hours of Service	Does the IT organization provide after-hours support for mission-critical systems? If yes, who provides the support?	N	0	O	1	Public Safety is outsourced to County. In the event of an after hour emergency staff is notified by CTO
8	Service Delivery Management - Service Levels	Does the IT organization have a service catalogue that identifies what IT services are provided, the service levels for each, and that is readily accessible by users?	N	0	N	0	
9	Service Delivery Management - Service Levels	Have City departments defined their need for IT systems availability?	N	0	O	1	This is discussed during 1 on 1 meetings between CTO and other City Department Directors and CM
10	Service Delivery Management - Service Levels	Can the IT organization meet user needs with current IT resources, staff and infrastructure?	N	0	Y	3	
3 - Business Applications Management							
1	Application Support	Does the City have an enterprise IT architecture and standards?	N	0	N	0	In development
2	Application Support	Does application staff attend and participate in vendor user groups and conferences?	Y	2	Y	3	
3	Application Support	Does the City have processes to ensure that commercial-off-the-shelf (COTS) applications are utilized largely as delivered with no or only essential custom modifications? If custom modifications have been implemented, are there processes in place to ensure that they will be supported in future releases of the application?	N	0	Y	3	Process was implemented during FY17
4	Application Support	Does the City use application service providers (“Cloud” or ASP) or store data in external sites (such as Dropbox, etc.)? If so, are procedures in place to ensure the ownership, security, and integrity of hosted information?	N	0	O	2	Mixed. Formal contracts with most providers that spell out these items – informal for Dropbox.

Nbr	Dimension / Category	Best Practice Factor	IT Best Practice Conformance				Comments (NL = Comment from NexLevel)
			2015		2017		
			Yes, No, Other	Score	Yes, No, Other	Score	
5	Application Support	Does the IT organization support any ad-hoc applications based on products such as MS Access or FileMaker Pro? Are there procedures in place to restrict Departments from deploying ad-hoc applications?	N	0	O	1	I&T are replacing these systems with COTS as we find them.
6	Application Support	Does the IT organization have a formal resource management plan to allocate resources to applications?	N	0	O	2	Informal. I&T was restructured to provide three staff (Manager + 2 Business Systems Analysts) to provide application support to the organization
7	Standards	Does the IT organization regularly apply new vendor releases and upgrades (production vs. current release)?	Y	2	Y	3	
8	Standards	Are test environments provided for each application?	N	0	O	2	Test environments are available for most enterprise applications.
9	Standards	Are updates tested by users?	Y	1	O	1	I&T provides the environment and requests the end user test functionality. In most cases this happens.
10	Application Effectiveness	Does the IT organization routinely plan for the functional enhancement, technical renovation or replacement of applications?	N	0	O	2	I&T has recently reviewed most enterprise applications and has taken steps to upgrade/replace exiting apps as needed.
4 - Infrastructure							
1	Network	Does the IT organization maintain Open-Systems Interconnection (OSI) conformant diagrams that depict its topology as well as the configuration of major nodes?	N	0	N	O	
2	Network	Does the IT organization ensure that the network is protected from intrusions by firewalls, DMZ, et al?	Y	2	Y	3	
3	Network	Does the IT organization have network management tools (CiscoWorks, Openview, etc.) and use them to routinely assess network usage and performance and track trends?	Y	2	Y	3	

Nbr	Dimension / Category	Best Practice Factor	IT Best Practice Conformance				Comments (NL = Comment from NexLevel)
			2015		2017		
			Yes, No, Other	Score	Yes, No, Other	Score	
4	Internet Access	Does the City have an acceptable use policy that is signed by all employees with internet access?	N	0	Y	3	
5	Remote Access	Does the City have a formal policy governing which users are eligible for remote access and that defines the procedures for granting and revoking access?	N	0	O	2	City has an informal process to define who has remote access. This is arranged between I&T and Department senior management.
6	Remote Access	Is there a formal process for granting and monitoring remote access by vendors?	N	0	N	O	
7	Servers / Data Storage	Does the IT organization have formal policies for the granting of administrative rights?	N	0	O	2	Admin rights are provided for those individuals with a clear need. These rights are reviewed by I&T management.
8	Servers / Data Storage	Does the IT organization perform routine performance monitoring to ensure that servers can support business applications?	N	0	O	1	I&T have tools (SolarWinds, Netsight) that provide this information. I&T are notified when performance variables reach thresholds that require attention – e.g. disk space at 80% utilization
9	Servers / Data Storage	Does the IT organization perform routine performance monitoring to ensure that that centralized storage (NAS, SAN) is being used effectively and that sufficient capacity is on-hand to meet current and future requirements?	N	0	O	1	I&T have tools (SolarWinds, Netsight) that provide this information. I&T are notified when performance variables reach thresholds that require attention – e.g. disk space at 80% utilization
10	Data Center Environement	Is the general layout of the main server room acceptable? Does the layout provide access to both the front and rear of racks? Has provision been made to prevent situations such as flooding and fire?	N	0	N	0	While the server room provides access to both front and back of racks. Significant ssues remain with fire/flood/earthquake situations.
5 – Security / Information Protection							
1	Network	Does the IT organization routinely perform perimeter of other testing to ensure that intrusions are blocked and reported? Discuss the results of any independent vulnerability/penetration testing that has been conducted.	N	0	O	2	Auditors run penetration tests annually. I&T is working to have more hardened testing in the future.

Nbr	Dimension / Category	Best Practice Factor	IT Best Practice Conformance 2015 Yes, No, Other	2015 Score	2017 Yes, No, Other	2017 Score	Comments (NL = Comment from NexLevel)
2	Physical	Does the IT organization monitor access to sensitive IT and business areas?	N	0	O	1	I&T is in the process of implementing the Lepide auditing suite for this purpose. Will be operational by June 2017
3	Data	Does the IT organization have procedures in place to manage user passwords (such as requiring strong passwords and periodic changing of passwords)?	Y	2	Y	3	
4	Data Backups	Does the IT organization routinely backup critical information? If yes, please indicate in the comments section: • What is backed up? • Does the organization utilize Incremental and/or full backups? • Snapshots?	Y	2	Y	3	All data on servers are backed up via snapshots.
5	Data Backups	Does the IT organization have an off-site retention plan? Is a commercial service used?	Y	2	O	1	Data is replicated in another facility – within 2 miles of City Hall.
6	Data Backups	Does the IT organization routinely verify and test backups?	N	0	N	0	
7	Business Continuity Plan	Does the City have a business continuity plan?	N	0	O	1	Informal. Data is replicated in another facility besides City Hall. Network redundancy is established at some facilities.
8	Business Continuity Plan	Does the IT organization have the ability (people, plans, processes, procedures, and other resources) needed to react to a service interruption and resume service in an acceptable timeframe?	N	0	O	1	Very informal. Infrastructure is present to allow for this – how this will be accomplished is very rough.
9	Virus/Spam Protection	Does the IT organization deploy anti-virus, anti-spyware, and anti-spam on user desktops?	Y	2	Y	3	
10	Virus/Spam Protection	Does the IT organization have a plan for virus attack response?	Y	2	y	3	
6 - Administration							

Nbr	Dimension / Category	Best Practice Factor	IT Best Practice Conformance				Comments (NL = Comment from NexLevel)
			2015		2017		
			Yes, No, Other	Score	Yes, No, Other	Score	
1	IT Organization	Is there an organization chart for the IT organization?	Y	2	Y	3	
2	IT Organization	Are the functional responsibilities for each unit clearly delineated?	Y	2	Y	3	
3	IT Organization	Are present staffing levels adequate to enable the IT organization to meet its current responsibilities?	Y	2	Y	3	
4	IT Organization	Does the IT organization have a succession plan for each position?	N	0	O	2	
5	Procurement, Contracts and Vendor Management	Does the IT organization have contracts tracking and management process in place?	N	0	N	0	
6	License Management	Does the IT organization have a central repository for all IT licenses?	N	0	0	1	Stored with Admin for I&T.
7	Inventory Management	Does the IT organization have a hardware and software inventory control system?	N	0	O	2	KACE for hardware and office apps, spreadsheet for Enterprise applications
8	Budget	Are all technology maintenance contracts budgeted within the IT organization?	N	0	O	2	This began in FY17. Security systems (CCTV and Alarms) are the only technology not under I&T
9	IT Plans	Does the City have a strategic IT plan?	N	0	O	2	Tactical plan for FY17 – Strategic Plan being developed.
10	IT Plans	Does the IT organization a detailed workplans for internal and user projects?	N	0	O	2	Tactical work plan for each business unit within I&T. Reviewed bi-weekly