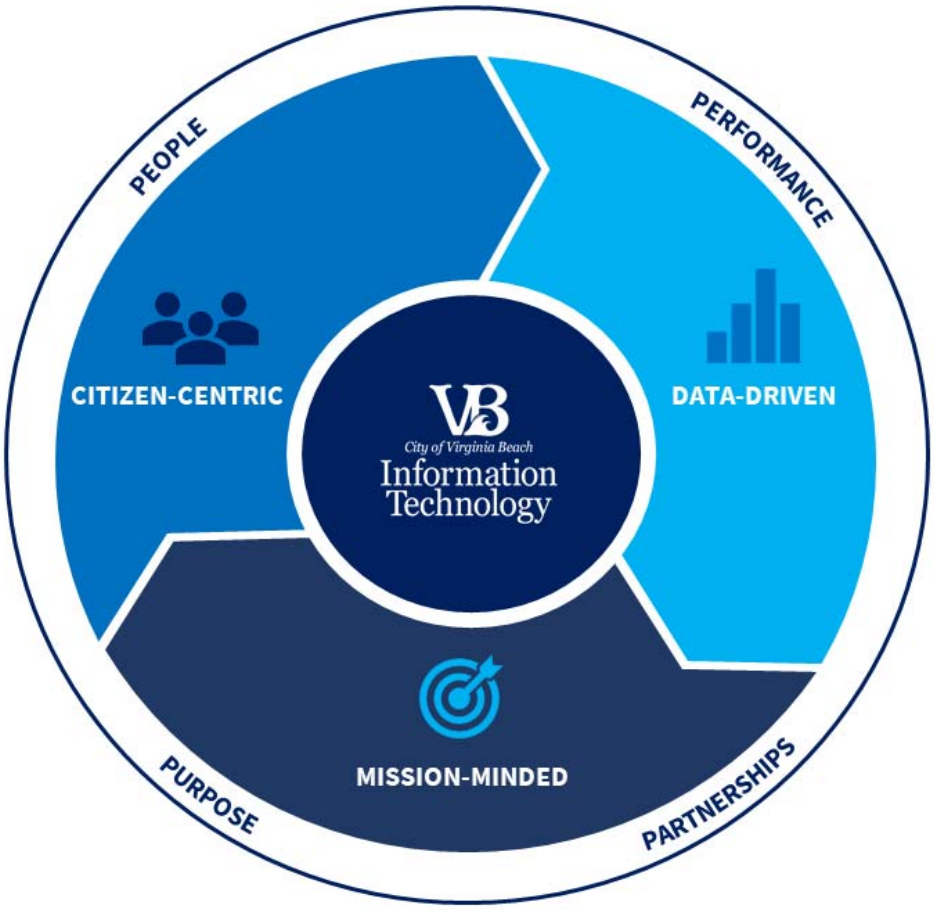
Enterprise Technology Plan

City of Virginia Beach

Information Technology Philosophy



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Letter from the CIO

We are in the people business.

Citizens are the motivating factor behind every decision we make. Their needs drive the technology we procure, the software we deploy and every initiative we implement.

Information Technology (IT) is on a mission to empower citizens and City employees with greater access, convenience and security through strategic investment and responsible innovation. In an increasingly digital and mobile world, speed of delivery has become critical. Such velocity invites our organization to keep pace with the evolving expectations of citizens while preparing employees for the future of work. As I present the Enterprise Technology Plan (ETP), my primary endeavor is to make IT about the people we serve.

Yes, we are leading the City's digital transformation to modernize infrastructure, capabilities and processes. But to be clear, we cannot do it alone. This document represents more than an "IT Department" plan. Multiple departments within the City contributed ideas, insights and input based on their business requirements. Together, we have created a cohesive, dynamic strategy that reflects the City's collective vision for our technological future. It is a compelling blueprint that illuminates our path to a better tomorrow. It is truly citizen-centric, data-driven and mission-minded. We anticipate ongoing collaboration and transparent communication to successfully achieve the 19 initiatives detailed in this plan.

The ETP is designed to be agile, flexible and adaptable so that IT will remain proactive in aligning with City Council goals to ensure we deliver relevant results. The ETP is aligned to the City's Five Strategies that have been established based on citizen and stakeholder feedback:

- 21st Century Infrastructure
- Safe & Healthy Community
- Growing Economic Opportunity
- Thriving Neighborhoods
- Innovative and Sustainable Government

The ubiquitous power of data and technology will help us address some of the biggest issues impacting communities and position us for emerging opportunities. Our approach is local, regional and global. Our transformation is ongoing. Our resolve to think more deeply about the value we provide is evident. This plan tells the story of where we are, where we are going and how we will get there. Challenges will arise along the journey, but we believe IT is a worthwhile investment.

Toward Success,

Peter Wallace

Chief Information Officer

City of Virginia Beach

1 Executive Overview

1.1 City of Virginia Beach Overview

Virginia Beach, with a population over 460,000 residents, was named by WalletHub as 2018's 2nd "Best Big City to Live" in the nation. As of March 2020, the City employs approximately 7,200 members with an annual budget just one billion dollars (excluding schools). By population, Virginia Beach is the largest city in the Commonwealth of Virginia and the 37th largest city in the United States. Our City has over 38 miles of shoreline, 79 miles of scenic waterways, numerous historic landmarks, an outstanding school system, several leading military facilities and superior cultural amenities. Virginia Beach has long been recognized for excellence in leadership and management, with a highly effective City Manager-Council form of government. City Council has developed a vision for the City of Virginia Beach being a "**Community of a Lifetime**."

Our City provides the community with a wide variety of services which include police and fire protection, education, library services, health and human services, road construction and maintenance, emergency medical services, water, sanitary sewer, storm water, waste management and a variety of social services. In addition to these core services, our City provides services valued by the community to improve the quality of life of its residents and visitors. These services include parks, recreation centers, the Virginia Aquarium, the Amphitheater, the Farmers' Market, bike paths, landscaping and community planning. There are also services that the community needs for the future, including economic development activities, growth management efforts and strategic planning.

1.2 Information Technology Environment Overview

The City of Virginia Beach is a diverse blend of businesses, attractions and people and the Information Technology (IT) department manages a complex and sophisticated technology environment to support all City service areas. The City's IT department supports and maintains 6,419 computers, 747 servers, 479 mission critical line-of-business software applications and 624 additional personal productivity software tools to facilitate the work of the employee base. These assets are utilized by 34 departments and agencies with 105 off-campus sites including Police, Fire, Emergency Medical Services, Libraries, Recreation Centers, Human Services, Commissioner of Revenue, Treasurer, Public Utilities and Public Works.

IT manages a scalable, robust network of technology infrastructure to deliver services on this scale. The City has over 200 miles of optical fiber and networking equipment, including integration with leased fiber and third-party connectivity services through multiple IT data centers. We also provide the communications services required to conduct daily City business. Over 6,000 telephones and 5,500 radios (public safety and non-public safety) are deployed throughout the organization.

1.3 Impetus for Change

The City's first Master Technology Plan (MTP) was adopted by City leadership in the spring of 2014 after a comprehensive assessment determined that IT needed a proactive, strategic vision to guide priorities, investments and projects into the future.

The inaugural plan established strategic goals, objectives and supporting initiatives to modernize and transform IT service delivery. The fundamental elements of the MTP included four strategic objectives that support IT services for our citizens, members, business partners and visitors.

These strategic objectives were established to:

- **Transform Service Delivery**
- **Build Better Business Solutions**
- **Strengthen Governance**
- **Improve Infrastructure and Operations**

Thirty-two initiatives were identified as part of the inaugural plan targeted to transform service delivery, build better business solutions, strengthen governance and improve infrastructure and operations throughout the organization. Ninety-three percent of the initiatives have been completed. The remaining two initiatives will be continued into the upcoming strategic planning period.

1.3.1 Master Technology Plan Successes

The City's first Master Technology Plan was highly successful and spearheaded transformative initiatives that greatly benefited our City as well as our region. From 2016-2018, the City of Virginia Beach was awarded first place in the Center for Digital Government's (CDG's) Digital Cities Survey. In 2019, the City earned 3rd place. The survey measures City performance and innovation in technology use. The modernization and digitalization initiatives from the first technology plan directly contributed to City's ability to secure this national recognition four years in a row – which is a significant accomplishment. In addition, our City earned the 2018 International Data Corporation (IDC) Smart Cities North America Award for innovative 'smart water' solutions that was enabled by the department's use of advanced technologies facilitated by our technology plan.

Master Technology Plan accomplishments resulted in benefits that positively impacted daily operations across all departments. Our City now has high speed, redundant network capability. Aging and inconsistent server architecture has been replaced and stabilized. Applications are upgraded on a planned lifecycle schedule and proactively managed. Our City members can now build visual data dashboards that deliver meaningful information and facilitate decision-making. The public safety radio system is state-of-the-art, utilized by the region and funded to

maintain currency. The aging data center facilities were updated with modern and redundant systems and security measures and have paved the way to establish a next-generation data center program that will promote security, agility, recovery, resiliency and business continuity.

The successes achieved through the first technology plan has established the foundation for success for our new technology plan. Our CIO's vision and values support agility, transparency, accountability and innovation and as such the department has the experience to embrace the opportunities of this plan and deliver community-wide benefits and business value.

1.4 Enterprise Technology Plan Development & Refinement

Our Enterprise Technology Plan (ETP) is the continuation of the strategic planning process that has realized many transformational successes from our first Master Technology Plan. Our focus remains continuity of quality service delivery and business solutions that are valued by our customers.

This ETP is developed in collaboration with City leaders, City agencies and City staff. The plan is designed to be agile and adaptable to the evolving priorities of our City. The City of Virginia Beach's Vision and City Council's five strategies are continuously studied to ensure alignment with the identified technology plan objectives and initiatives so that relevant results are achieved.

A variety of tools and methodologies continue to be leveraged to measure key service areas within our organization. Gartner's ITScore Methodology was used to assess and evaluate service areas across IT and our organization including vendor management, data management, applications management and infrastructure/operations just to name a few. This methodology not only provided perspective into the current state of IT capabilities; it provided a forward-looking perspective establishing a target state. Members across the organization participated in this process providing invaluable insight throughout the strategic planning process.

Workshops were organized with representatives from every City department designed to capture current and future business requirements that were translated into business imperatives to ensure future success. City business leaders with internal and external customer-facing responsibilities participated in defining and recommending transformational change for which we all will be responsible. All City departments recognized that they are an essential piece to the success of the ETP and as such have committed to partnering with IT for the implementation of the plan.

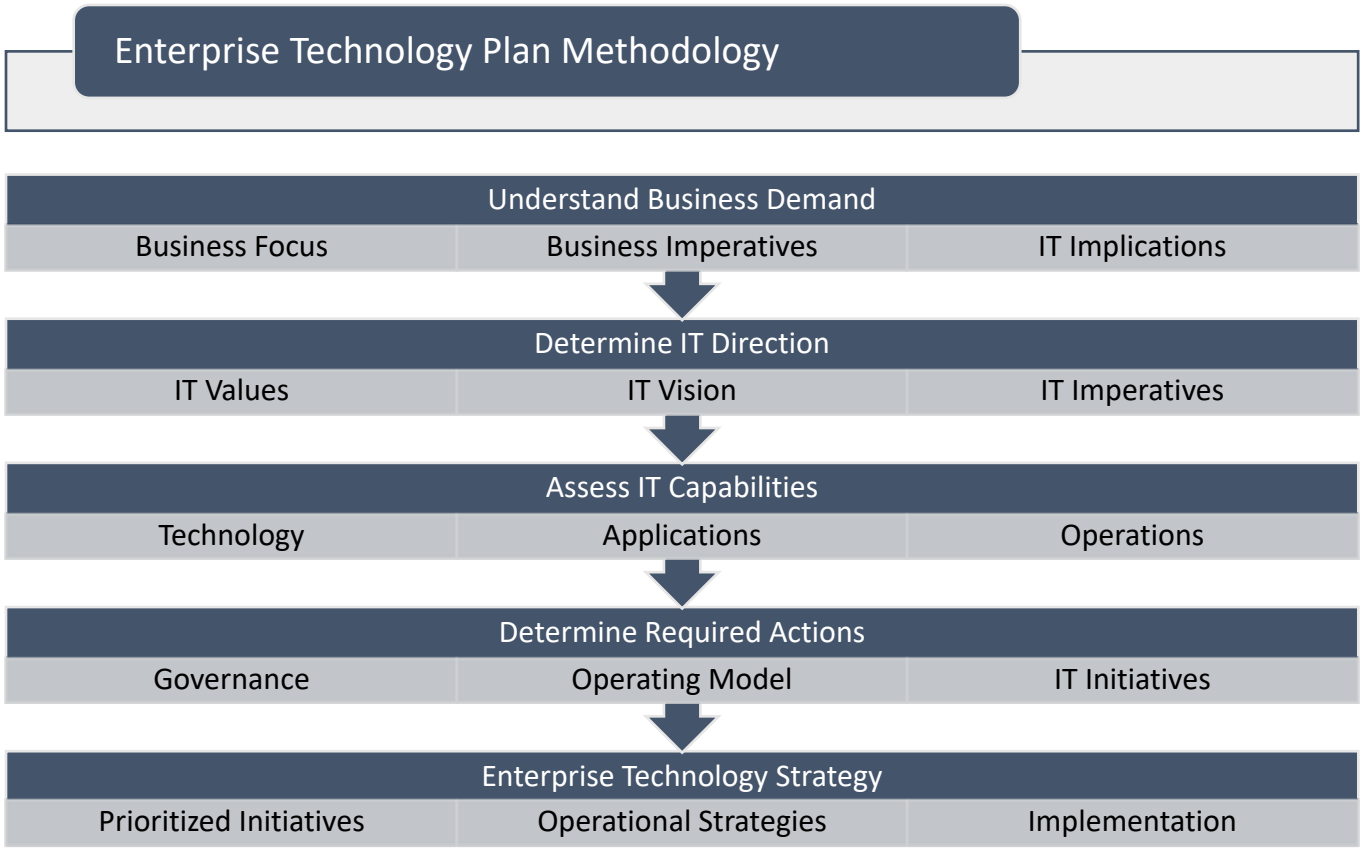
As a result of this comprehensive approach to strategic planning and analysis, four enterprise technology objectives were validated and will be foundational to our future success including Service Delivery, Business Solutions, Governance and Infrastructure and Operations.

With our enterprise technology objectives clearly identified, nineteen strategic initiatives have been defined and aligned to the City's business imperatives that support the City Council's

strategies and goals for the City of Virginia Beach. We will use the City's governance and budgeting process to create an annual roadmap leveraging the compelling direction established in the ETP.

The ETP provides a fascinating blueprint for impactful transformation and growth of City-wide capabilities and services that will be valued by our citizens, visitors, businesses and regional partners.

The figure below provides a visual of the methodology that was followed to deliver the ETP.



2 Vision, Mission and Values

2.1 The City of Virginia Beach

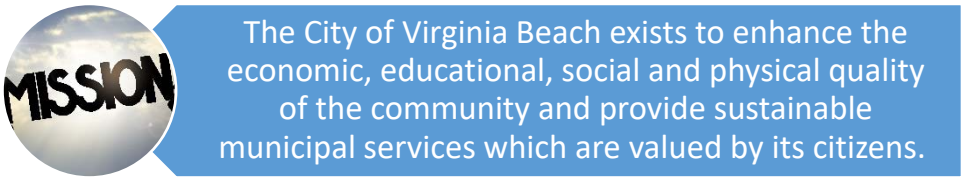
2.1.1 Vision

The City's vision statement reflects an aspirational yet achievable goal to be recognized by citizens, businesses, visitors and regional partners alike as the "**most livable coastal community**".

Virginia Beach is the most livable coastal community in the world. Located within the southern Chesapeake Bay region, it is defined by its rich natural resources and exciting, diverse, interconnected neighborhoods. We are united by our broad social, cultural and recreational offerings, a thriving regional economy and life-long learning opportunities that create a synergy where all citizens can live healthy lives, grow daily and continuously reinvent and prosper.

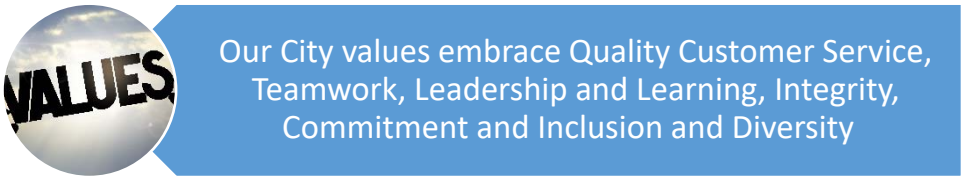
2.1.2 Mission

The City's mission statement delivers a simple and pragmatic pledge to uphold the community's well-being through quality services for all.



2.1.3 Values

Our organization is based upon a belief in the democratic process of government. This belief provides meaningful ways for citizens, representing the diversity of our community, to contribute to the development of public policy. This process is enhanced by our organizational values which guide our performance. The values define our desired organizational culture and quality of work life.



2.2 Information Technology

2.2.1 Vision

IT is committed to proactively delivering dynamic services and innovative technologies on which the City depends. We set and achieve high standards in the following areas:

- Business and IT Alignment
- Information Accessibility
- Openness and Transparency
- Civic Participation
- Operational Efficiency
- Quality Workforce
- IT Security

2.2.2 IT Mission

The mission of IT is to connect people to relevant technology solutions efficiently, quickly and consistently across the City.

2.2.3 IT Values

AGILITY

We adapt quickly to disruptive forces (changes in business needs, markets and operating models, technological advancements, etc.). IT moves quickly and effectively to solve business problems while maintaining security and the ability to perform to expectations.

TRANSPARENCY

We are open and transparent in all processes, decisions and information. Transparency promotes trust, accountability, integrity, communication, collaboration and improvement.

ACCOUNTABILITY

We hold ourselves accountable and live up to our responsibilities. We understand that when our members are successful, the organization is successful. Our primary duty is to the City's vision, mission and values.

3 Business and IT Alignment

3.1 City Council Strategies

City Leadership has established the following objective to which it's strategies will be defined and plans created to ensure the successful implementation of the City's vision for the current fiscal year and beyond.

Through continuous innovation, measurement and improvement we will enhance the quality of life and the City's economic vitality for residents, employees, business and visitors while investing in sustainable and resilient infrastructure

Five strategies have been identified that reaffirm the commitment to the City's vision and to ensure the City remains a "Community for a Lifetime." These strategies define how our organization will be successful by adding clarity to vision and provide guidance and direction to City departments, whose responsibility it is to ensure the City achieves its vision. Additionally, these strategies establish a framework for prioritization for the entire City organization providing a roadmap for growth and prosperity.

City Council Strategies

- ✓ 21st Century Infrastructure
- ✓ Safe & Healthy Community
- ✓ Growing Economic Opportunity
- ✓ Thriving Neighborhoods
- ✓ Innovative and Sustainable Government

IT is a critical component of service delivery and the City cannot succeed without the capabilities and advantages that IT provides. For the City to truly perform at its best, it is imperative that our technology investments fully align with City Council strategies and priorities.

IT will continue to work across the organization to ensure that each of the projects and initiatives we undertake be directly aligned to at least one of the City Council strategies. These initiatives will have established milestones that will gauge progress toward a desired future for the City of Virginia Beach.

IT is foundational to the success of City Council's strategies and we will continue to support City Council in enabling these strategies. Several IT Initiatives have already enabled these strategies and are represented in the chart below.

IT Aligned Initiatives

21st Century Infrastructure	•StormSense Project •Enhanced Enterprise GIS Capabilities
Safe & Healthy Community	•Integrated Public Safety •Data Analytics & Business Intelligence •Internal Hackathon - Preparedness, Resiliance and Response
Growing Economic Opportunity	•Waze Connected Citizens Program •VB Events Mobile Application (Real Time Parking Information)
Thriving Neighborhoods	•Higher Education Facilities Connected Via Fiber Ring •Public Libraries - Access for everyone including updated network equipment and connectivity. •Housing and Neighborhood Preservation - Updated Technology / Workforce Mobility •Housing Resource Center - Data and Technology to enhance Community Livability
Innovative and Sustainable Government	•Regional Connectivity Fiber Ring; •Transoceanic Cables •Data Centers •Data Analytics & Business Intelligence

3.2 STIR and IT Alignment

IT continues to partner with the Strategy, Transparency, Innovation and Resiliency (STiR) office to advance the City's vision, mission and goals for the enterprise. STiR is charged with facilitating City Council goals through a three-point organizational service model that includes strategy, support and development.

STiR works across the enterprise to provide services that include:

- **Strategy development**
- **Process improvement and re-engineering**
- **Data analytics and reporting**
- **Innovation capabilities**
- **Team building and facilitation**

STiR is instrumental in facilitating organizational culture change in our City. STiR's mission supports many enterprise IT strategic objectives and tactical initiatives. Our capabilities and skills enable STiR's success in the execution of their mission thus, STiR and IT are strategically aligned.

STiR and IT recognize that a partnership given our mutual goals and initiatives would be advantageous and benefit the entire City. Together, we have identified areas of partnership to advance mutual goals that will enable the successful completion of enterprise priorities as identified by City Council.

These potential collaboration opportunities will be refined through ongoing planning and discussion. The STiR-IT cross-departmental working relationship will continue to build synergies to ensure the greatest potential for success in both organizations' endeavors.

4 Enterprise Technology Plan Initiatives

The development of the ETP focused on strengthening the business value of IT by identifying organization and leadership objectives that IT will directly impact. The ETP extends the business value of IT achieved by the inaugural technology plan by aligning technology initiatives to specific business and leadership goals of today and the future.

IT will continue a transformational journey that will focus on security, agility, transparency and accountability in Service Delivery, Business Solutions, Governance and Infrastructure and Operations.

Service Delivery

- Promote a Citizen-Centric Approach
- Transform Organization Culture
- Enhance Resource Management
- Improve Business Processes

Business Solutions

- Implement a Customer Relationship Management System
- Expand Access to Data
- Leverage Mobile-Friendly Applications
- Automate Services and Processes
- Use Cloud Solutions to Improve Application Delivery
- Invest in the Enterprise GIS Platform
- Evolve as a Smart City Striving for Digital Equity

Governance

- Ensure Technology Investments Align with Enterprise Strategy
- Derive Greater Value from Vendors
- Grow Program and Project Management
- Ensure Continuity of Operations Following a Disaster
- Enhance Security of Data Assets

Infrastructure and Operations

- Upgrade Infrastructure to Sustain our Assets & Mobile Workforce
- Enable Regional Expansion through Next Generation Network Growth and Resiliency
- Modernize Security Infrastructure to Protect Data and Assets

4.1 Service Delivery

Quality customer service is a core value of our organization and is the reason why the City of Virginia Beach municipal government exists. The ETP focuses on City Council goals and top priorities that will improve service delivery to our community. We have identified opportunities to transform service delivery, including enhanced communications, staff empowerment, agility, transparency and accountability.

Service Delivery Initiatives Alignment

City Council Strategy Alignment

21st Century Infrastructure

- Improve the Transportation System
- City Assets and Infrastructure are Well Maintained and Meet Community Expectations

Safe & Healthy Community

- **Be the Safest City in Virginia**

Growing Economic Opportunity

- **Grow the Local Economy**
- **Create a Financially Sustainable CIty, Providing Excellent Services**
- **Be a Competitive First Class Resort for Residents, Businesses and Tourists**

Innovative and Sustainable Government

- **Data and Technology is used to Enhance Community Livability, Prosperity and Sustainability**

Thriving Neighborhoods

- Revitalize Neighborhoods and Plan for the Future
- **We are an Inclusive Community That is Welcoming and Empowers All**
- Our Community Has World Class Schools and Educational Programs

City Business Imperatives

- **Access to City Data**
- **Business Intelligence Capabilities**
- **Mobile Access to City Systems**
- **Online Business Capabilities**
- **Process Automation & Improved Efficiency**
- **Information Security & Privacy**
- **Business & Service Continuity**

Bold text indicates Goal, Priority, Imperative alignment

4.1.1 Promote a Citizen-Centric Approach

IT is leading our organization on a journey to become the digital government of the future. Digital government “is an organization or a unit inside an organization whose product set and business model are only made possible by the use of information and digital technology” The journey in which we are leading our organization is one of digital government transformation. As we consider our journey, we must begin to think about our customers and citizens in a completely different way.

Citizen-centric is an approach that tailors products and services to the needs and desires of our customers and citizens. Products and services are most often provided with a focus on City functions and the business requirements identified but do not fully consider the needs or the desire of our citizens. Becoming citizen-centric requires all City businesses to commit to end-to-end product and service provisioning. This commitment requires documenting and understanding operational challenges and identifying innovative solutions to enhance services for the organization and the citizen or business. Elevating citizen-centric requirements gathering will happen by assessing end-to-end processes and enhancing capabilities through the adoption of an industry standard ‘best practices’ framework that will guide our City to greater citizen-focused maturity.

Digital transformation changes the way government works to solve specific citizen challenges by changing the view of government from department-centric to customer-centric. Multiple organizations, both public and private, collaborate to solve a common objective by developing solutions from the customer’s view through redefining how connecting data, systems and new tools can provide creative solutions. Thus, citizen challenges are viewed in a wider ecosystem.

Track Performance Metrics

Many cities, including Virginia Beach, are participating in certification processes to better understand their current operational pulse and identifying opportunities to be citizen-centric and competitive thus increasing overall business value. Bloomberg Philanthropies “What Works Cities”, “Star Communities” and “ISO for Smart Cities” all provide guidance, technical specifications and certifications to become ‘smart’ and citizen-centric. These frameworks rely on performance metrics to show public sector organizations specific areas for potential growth and increased citizen-centric focus. Virginia Beach has already started using world-class data and analytics tools to prepare a baseline for current performance metrics.

Increase Citizen Focus through Innovation

With tracking metrics in place from the assessment of our City’s current state, the certification recommendations and processes will be followed to achieve the highest maturity ratings. The outcomes of the metrics and recommendations that will foster and promote a citizen-centric focus will transform into initiatives and projects within City departments. IT will continue to collaborate with City business units on innovative projects that will increase citizen-centric focus and enhance City-wide operational capabilities.

4.1.2 Transform Organizational Culture

Organizational culture plays a significant role in how successfully an organization transforms and grows. A continual focus on cultural evolution will be necessary to transform service delivery and become open, transparent and responsive to the dynamic changes in technology that impacts our organization today and into the future. Organizational culture is very difficult to change and will be an ongoing process for employees to continually adapt. This initiative will implement a series small 'culture hacks' that will promote adaptive changes to processes and procedures to facilitate and drive culture change within IT and throughout our organization including City and Schools. The initiative will focus on staffing and recruiting, customer service delivery and engagement, performance management, communications and member empowerment to effectively transform organizational culture and in turn drive business transformation.

Enhance Departmental Recruiting and Staffing

IT will hire employees who will contribute to a strong and healthy organizational culture. IT will improve the candidate selection and hiring process to emphasize the importance of an open, transparent and service-oriented organization. Departmental recruiting and staffing must also include an enhanced performance management capability to ensure efficient and effective employee life cycle management.

Encourage Agility

Being responsive to complex and rapidly changing environments requires a culture that encourages agility and adaptability. IT will introduce via its mentoring, onboarding and coaching activities the ability to anticipate change, take decisive action and execute rapidly to improve service delivery and citizen satisfaction.

Grow and Expand Training Opportunities

Service delivery transformation requires an ongoing commitment to employee development. Staff development using well-aligned training plans will promote employee growth, agility and empowerment. Continuous employee learning and development is essential for preparing our workforce to engage in the initiatives and projects that are essential in achieving the strategic goals and top priorities that have been identified by City Council.

IT will continue to take a formal approach to develop and implement training plans. Service area leaders will identify current and future needs and will determine skill gaps within their teams. New disciplines will have training programs that are developed to efficiently and effectively uplift member skills to ensure staff are ready to meet the ever-changing demands of our organization. Highly technical roles, such as those in infrastructure and operations, will receive ongoing skills development that maximizes the value of our significant technology investments. Timely improvement of skillsets in an ever-changing business and technology landscape increases ownership and empowerment throughout the organization, thus transforming culture.

Empower the Workforce

A healthy and open culture exists when leadership and management throughout the organization empower members to make appropriate decisions within their areas of responsibility. IT will empower employees by training staff to recognize the potential impact of decisions, to make data-driven decisions and to consider or encompass the organization's goals and priorities when making decisions.

Enhance Internal and External Communications

Transparency, accountability and open communication builds trust throughout the organization and creates an environment where members are informed and engaged. Quality customer service relies on a variety of communication channels as well as access to data and information that informs decision making at all levels of the organization. Working collaboratively across the organization requires transparency, accountability and enhanced communications to achieve the goals and priorities that have been identified by City Council. Enhancing communications between internal and external stakeholders will improve service delivery, member productivity and culture across the organization. IT will redesign its communications plans and guides to ensure we are informative, transparent and responsive.

4.1.3 Enhance Resource Management

IT will continue to enhance resource management capabilities that will enable initiatives and projects that are prioritized to deliver the greatest business value to the organization. The demand for Information and Technology services is increasing significantly and require a methodology for shaping that demand, aligning capacity to organizational priorities and allocating resources equipped to achieve mission-critical priorities that align with City Council goals and priorities.

Resource planning and management will be refined into a formal activity that will include IT as well as resources in our business units. Policies and processes will enable the effective planning and managing of resources and work to ensure the greatest opportunity for success. Capabilities of our governance tool will be fully optimized to facilitate resource planning and management processes as well as predictive analysis capabilities that will enable long-term planning.

4.1.4 Improve Business Processes

IT has engaged in a Business Capability Mapping initiative that will include IT processes. This initiative will document, publish and manage internal IT processes. Repeatable, efficient and streamlined processes will be developed to create efficient operations and improve customer service.

A Center of Excellence (CoE) will define, establish and update the processes, tools, governance and training plans for the program. A successful and sustainable program requires

clearly established goals and objectives that will ensure success. Program governance is essential in developing, publishing, measuring, monitoring and refining business processes within the department to improve business value.

IT will utilize a process documentation and development tool to enable a common, standard approach to developing and publishing process documentation. We will refine the use of the of the tool to continue to meet the evolving needs of departments and our organization. The resulting process flows and documentation will be accessible to all process owners and the resulting process documentation will be available to all employees and business units to ensure clarity in understanding of end-to-end processes.

4.2 Business Solutions

One of the most important outcomes of our enterprise technology planning assessment was identifying current and emerging business needs and capabilities that define our roadmap for the future. IT in partnership with City business unit leaders, identified business themes that are essential to the success of our City. Themes included data access, intelligence, analytics, automation, increased online business capabilities, workforce & citizen mobility, information security & privacy and business & service continuity. transparency and accountability.

Business Solutions Initiatives Alignment

City Council Strategy Alignment

21st Century Infrastructure

- **Improve the Transportation System**
- **City Assets and Infrastructure are Well Maintained and Meet Community Expectations**

Safe & Healthy Community

- **Be the Safest City in Virginia**

Growing Economic Opportunity

- **Grow the Local Economy**
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Innovative and Sustainable Government

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Thriving Neighborhoods

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City Business Imperatives

- **Access to City Data**
- **Business Intelligence Capabilities**
- **Mobile Access to City Systems**
- **Online Business Capabilities**
- **Process Automation & Improved Efficiency**
- **Information Security & Privacy**
- **Business & Service Continuity**

Bold text indicates Goal, Priority, Imperative alignment

4.2.1 Implement a Customer Relationship Management System

A Customer Relationship Management (CRM) system is a tool that tracks customer (citizen) interactions and logs a history of customer requests or inquiries. Customer relationship management is an approach to manage the City's interactions with current and potential customers and citizens. The City will implement a CRM system that leverages data and analytics from customer and citizen experiences and interactions providing valuable insight to improve business relationships and customer satisfaction.

This integrated CRM system will establish a clear overview of our customers and citizens that will be available to all business units within the City organization through customizable dashboards. Traditional systems have focused on sales and marketing however government entities are realizing great opportunities in defining, designing and delivering products and services that are well informed and citizen-centric.

IT will evaluate next-generation capabilities including built-in intelligence that will provide for automation of a variety of tasks, service routing and predictive analysis. Additionally, these advanced capabilities will provide visibility into customer and business interactions across the organization even when services are provided in a specific business unit.

4.2.2 Expand Access to Data

Our City must continue to maximize the utilization of its data assets. We will remain at the forefront of digital transformation and innovation through expanding data access, improving data quality, maintaining pace with advancing technologies and strengthening capabilities internally to leverage these technologies. The City will continue to implement and utilize new and advanced technologies, enhanced tools, processes and infrastructure and will expand internal capabilities while leading regional collaboration.

We will continue to research, design and implement new techniques and technologies to improve business processes and decision-making. These methods will include enhanced learning, the use of automated applications to perform simple, repetitive tasks such as the evaluation of extremely large data sets to reveal patterns and trends, streaming data technologies and artificial intelligence (AI) techniques to further the goals of improving operational efficiency, managing risks and maximizing business value. We will leverage the vast amount of data at the City's disposal, along with any relevant data available in the public domain, to intelligently model our systems and business operations.

The use of advanced analytics is already underway. We have successfully prototyped automated applications through the VB Connect mobile application. This application allows users to receive City news, find meetings, search jobs, obtain property information and request City services by asking Amazon Alexa (VB Connect Alexa) or Google Assistant (VB Connect Google Play).

Data governance provides for identification, availability, usability, integrity and security of data in the City. Data governance processes are being refined and expanded to ensure we fully leverage our data assets in all aspects of our work throughout the City. Refining governance processes ensures we are doing 'the right things' and making the best use of our assets and resources. Increased data quality will positively impact overall trust in data, resulting in increased use and adoption within the organization.

Data comes in various formats and this introduces a layer of complexity in how we provide data access for business customers. IT has implemented data structures, platforms and processes to simplify obtaining access to our City's data. This data centralization, organization and standardization will allow customers at all levels of the organization to use data to make fact-based decisions.

Over the past two years we have worked to build close relationships with business units throughout the City and we will continue these collaborative and supportive efforts. In close alignment with the Strategy, Technology, Innovation and Resiliency (STiR) office we will promote a data driven culture with a series of data and digital literacy programs. We will expand these collaborative efforts to foster a citizen-centric focus.

Our citizens work, travel and enjoy recreation in all areas of Hampton Roads; therefore, it is important that we engage with other cities and cultivate cohesive regional participation. IT will collaborate in data-related engagements with other municipalities, universities, state and federal governments and involved citizens. By working with local organizations, we will continue to offer others the ability to provide valuable input on the structure and availability of our data.

4.2.3 Leverage Mobile-Friendly Applications

City departments have identified the need for greater mobile workforce capabilities that will bring automation to business processes and significant improvement to customer services while reducing errors.

Many of our City members work in the field. They are away from desks and workstations but still must engage with City applications and data. We will enable workforce mobility by establishing a single portal that will provide real time, secure access to applications and data as needed when in the field. We continue to evaluate existing and new applications ensuring they are mobile-ready and will perform as expected in a variety of field-based scenarios. Applications in the procurement process will be assessed for mobile capabilities and new solutions will either have a mobile option, or the application will employ responsive design principals that render it viewable and usable on a variety of mobile devices.

IT will continue to engage in research and development of mobile applications that will bridge smartphones and connected devices in a variety of markets and services.

4.2.4 Automate Services and Processes

City business units expressed a strong desire to improve their capability to conduct business activities for all customers online. These business units also expressed the need to automate many of their manual processes to improve efficiency and redirect their workforce efforts toward high-value customer service functions.

As we continue to lead our organization on a digital journey to become the digital government of the future we must begin to think about our customers and citizens in a manner that reflects all aspects of the citizen's experience when receiving services from our organization. We must consider all elements including data, technology and things that already exist but have never connected so that the experience for the citizen is seamless and intuitive. An example of this would be "Minimized Travel to Obtain a Permit". The goal is to increase permit issuance compliance while reducing wait times and travel to city facilities. Digital optimization "which is the process of using digital technology to improve existing operating processes and business models" will be integral to our success as we map our citizen's journey and experience through product and service delivery. We will establish an innovative approach to automate process workflows and customer interactions on a unified platform. We will investigate and develop automation components such as user portals, digital process workflows and process orchestration. Together with our partner business units we will identify metrics that indicate a process' efficiency and will continuously measure to ensure the effectiveness of the automated process. An enterprise process automation solution that is capable of scaling to meet various requirements across the City's businesses will target simple-to-automate yet highly impactful processes to realize immediate business value.

4.2.5 Use Cloud Solutions to Improve Application Delivery

Cloud-first is an approach that evaluates the viability and appropriateness of cloud-based options before making any investments in on-premise software or hardware solutions. By leveraging a cloud solution, we will be able to quickly deploy applications and reduce the time and resources spent on development, infrastructure and support. This will allow us to focus more time and resources on maximizing value from the solution as well as developing innovative solutions that will compliment this investment. In addition, our City is actively embracing a smart City technology landscape and the cloud opens the door to implement smart technologies throughout the City.

IT will transition to a cloud-first assessment business model where we will develop a supporting structure to guide consistent processes, actions and decisions. This will include clear policies, objectives, roles and responsibilities for cloud deployment, support and services. The framework will also include a series of assessments to guide our approach to cloud solutions. A capability model will be used to evaluate current services and applications to determine which are good candidates for cloud migration. A risk assessment model will help identify solutions and services that cannot be moved to cloud due to unacceptable risks. A business valuation model will be used to evaluate the financial, quantitative and qualitative benefits realized by

selecting a cloud solution over an on-premise solution. A cost sharing model will be created to assess subscription fees, charge-back or show-back fees for using cloud services. Cloud vendor policies will prescribe service level agreements and exit strategies to guide how we divest ourselves from a cloud solution in a manner that retains data integrity and minimizes financial and operational impacts.

4.2.6 Invest in the Enterprise GIS Platform

Geospatial Information Systems (GIS) are a mission-critical capability used by multiple City departments to conduct daily business. The GIS platform collects, stores, manipulates and displays the City's geographical data with the purpose of functioning as a decision support tool. The system stores data that includes residential properties, elevations, flood zones, demographic data, streets, evacuation routes, voting districts, Capital Improvement Projects and building footprints.

Opportunities and benefits are understood and will be realized through a top-down, comprehensive approach to enterprise GIS management processes and expanded access throughout the organization.

IT will implement a sustainable, modernized GIS infrastructure program targeted to expand and improve GIS capabilities. GIS data will be co-located into a centralized location that can be accessed by members and business systems across the enterprise. GIS data sets will be moved to the cloud to enable new capabilities that support regional operability, information sharing and emerging business needs. The use of GIS data will be expanded as the City embraces advanced analytics and reporting.

The deployment of connected devices will continue to grow and transform our organization. Access to real time data from Internet of Things (IoT) sensors deployed in the environment will be consumed by City systems to generate meaningful data for use in forward-looking predictive analysis to enable decision-making and proactive problem-solving. This technology capability, which IT is currently enabling, is vital for monitoring sea level rise and flooding, for assessing and redirecting traffic flow and for monitoring weather conditions such as hurricane or tropical storm winds. As these connected devices continue to emerge, we will be ready to expand our access to data that will differentiate the City of Virginia Beach as a truly connected community.

4.2.7 Evolve as a Smart City Striving for Digital Equity

Governments around the world are realizing that smart technology adoption is a differentiating factor that will enable efficient service delivery for its citizens and is a competitive factor in attracting businesses, visitors and employees. Types of smart technologies include advanced data analytics, machine learning, artificial intelligence, automated applications ('bots') and connected, Internet of Things (IoT) devices. Modern cities are using these technologies to improve traffic flow, manage energy consumption, predict weather impacts and increase public

safety effectiveness. Adapting to change is inherent in this evolution to ‘Smart City’ technology. We are prepared for and have embraced smart technology through key strategic investments.

As we continue our journey, Digital Equity will be a foundational component of our Smart City strategy and implementation plan. Our citizens and workforce are the motivating factor behind every decision we make and as such, we must continuously evaluate the needs of our citizens and our workforce as we define, recommend and implement each initiative. Secure access and the effective use of technology we deploy is vital to building an inclusive community. We will continue to collaborate with our stakeholders including citizens, businesses and education institutions to evaluate the impacts of technology in our community.

Actionable plans are in development to build smart technologies into our City projects. Smart technology is a component of many initiatives in this plan, but this will stand as a foundational element to ensure these technologies are not an ‘afterthought’ in IT and City projects but an essential piece to project success. Our Smart City planning process includes the evaluation of two primary factors. First, access to broadband services. This primarily impacts underserved and unserved areas in our city and region. We are proactively upgrading our infrastructure and enabling regional expansion through our next generation network initiative to provide access. Second, affordability and knowledge to leverage the technology that is available. In partnership with business and city stakeholders we will continuously evaluate cost in our design process and implement a variety of communication plans as we deploy technology and build out our infrastructure so that all our citizens will be aware and included.

Our City continues to evolve to become ‘smart’ and adopting an enterprise focus will better ensure our actions support City Council goals and priorities. Strategic Goals teams have been identifying short-term and long-term solutions that align with City Council goals that often include smart technology components. These ‘Smart City’ projects are currently underway in multiple departments and we are in the early stages of deploying cloud environment infrastructure and related systems that will support the emerging smart technologies. We are already supporting emerging ‘smart’ projects such as the transformation of 311, waste/bulk collection improvements and parking availability monitoring.

New discoveries and better solutions are driven by innovation and we will continue this practice by providing resources dedicated time to identify and test new ideas while solving problems using unconventional methods. Leveraging agile and iterative methodologies will allow rapid prototyping of new solutions and ideas.

An innovation program will be established in collaboration with STiR focused on accelerating innovation that will be foundational to achieving our Smart City goals and objectives. The goal of this program is to encourage employees to come up with ideas, provide a structured model to present their concepts, provide funding to test or prototype and then take the successful ideas to implementation.

4.3 Governance

Governance provides our organization the opportunity to effectively direct and manage the funding and resources available for investments in new or enhanced business solutions. Governance ensures our organization is doing the right things at the right time with the right resources. Our primary objectives will be to strengthen governance that is already in place while establishing new governance models for core functions that align City and IT.

Governance Initiatives Alignment

City Council Strategy Alignment

21st Century Infrastructure

- Improve the Transportation System
- **City Assets and Infrastructure are Well Maintained and Meet Community Expectations**

Safe & Healthy Community

- **Be the Safest City in Virginia**

Growing Economic Opportunity

- Grow the Local Economy
- **Create a Financially Sustainable CIty, Providing Excellent Services**
- **Be a Competitive First Class Resort for Residents, Businesses and Tourists**

Innovative and Sustainable Government

- **Data and Technology is used to Enhance Community Livability, Prosperity and Sustainability**

Thriving Neighborhoods

- **Revitalize Neighborhoods and Plan for the Future**
- We are an Inclusive Community That is Welcoming and Empowers All
- Our Community Has World Class Schools and Educational Programs

City Business Imperatives

- **Access to City Data**
- **Business Intelligence Capabilities**
- **Mobile Access to City Systems**
- **Online Business Capabilities**
- **Process Automation & Improved Efficiency**
- **Information Security & Privacy**
- **Business & Service Continuity**

Bold text indicates Goal, Priority, Imperative alignment

4.3.1 Ensure Technology Investments Align with Enterprise Strategy

Enterprise Architecture (EA) is a framework and discipline that ensures an organization's IT investment decisions are aligned to best support the approved strategic roadmap, aligned to City Council goals and priorities. EA governs the implementation of those investments to ensure the desired business outcomes are achieved. City services are more streamlined and efficient when an EA framework is in place to ensure applications and infrastructure are well-suited and adhere to best practices. IT will continue to advance the maturity of Enterprise Architecture within the City and will refine the structure, purpose and functional foundations of the Enterprise Architecture group to definitively establish the discipline within the organization.

An Enterprise Architecture framework guides the EA approach, including the deliverables and development methods, repositories and responsibilities for the discipline. There are several publicly available frameworks and we will identify one or more of these frameworks and adapt it for use within the City. Additionally, we will develop and publish a catalog of IT services to be offered as well as the processes followed in providing these services. This will ensure the capabilities of the EA group are utilized to their fullest potential and that value from the discipline is realized as quickly as possible.

The Enterprise Architecture discipline collects, generates and uses a significant amount of data. EA tools are designed specifically to collect, manage and display this data in formats that are meaningful to all business units and will enhance investment decision-making for the organization. IT is currently evaluating EA solutions and will procure and deploy the tool that aligns with our City-wide needs.

Applications are significant investments for the City and maximizing the business value of technology assets that support mission-critical business processes is a core capability of Enterprise Architecture. IT has made notable gains in maturing our applications management approach. We've established an Application Portfolio Management (APM) role, an application rationalization process, a centralized repository of application data and a perpetual lifecycle plan to maintain the applications' technical and business health. We must now further develop our capabilities for building, sourcing, implementing and supporting business applications. IT remains committed to achieve a level of maturity that focuses on strategy, unified processes, clear communications and new forms of agile application development.

IT has made many improvements in how applications are assessed, acquired and supported. It is time to develop a comprehensive approach that guides how applications are managed in the City today and into the future. This application strategy will provide the guidance so that all decisions and actions follow a prescribed set processes and principles to ensure our business stakeholders have a clear understanding of the strategic direction of software investments for the organizations.

IT is currently migrating to a bimodal approach to work execution to become more agile and responsive to business needs. Bimodal is the practice of managing two separate but coherent

styles of work: one focused on predictability, the other on exploration. Mode 1 is a linear approach, emphasizing predictability, accuracy, reliability and stability. Mode 2 is a nonlinear approach that involves failing fast and learning through iteration. It emphasizes agility and speed as well as the ability to manage uncertainty.

A successful bimodal journey will be dependent on our culture transformation initiative in that both City businesses and IT must adopt a faster and more iterative work style. City government typically follows Mode 1 work style, valuing linear and predictable work patterns.

We have traditionally implemented new solutions with the assumption that they will deliver value and improve work efficiency. Investments in new applications and services are often justified by the estimated benefits they will provide – whether reduced resource requirements, cost savings or avoidance, or faster processing time. But that premise has never been tested – benefits are assumed but never objectively measured to ensure they have been delivered. In collaboration with the City business community, a business valuation model will be established that will be used to assess deployed solutions to determine the level of benefit realization.

The valuation model will include both quantitative and qualitative assessments. The model will be most effective when anticipated benefits have been researched and documented prior to solution selection and implementation. Those anticipated benefits can be compared to actual operational factors (cost, labor utilization, cycle times, transaction speed, customer satisfaction, etc.) to determine whether the solution delivered as expected and to identify where adjustments may lead to improved performance. Business valuation is expected to provide evidence as to which type of investments are best helping the City achieve strategic goals.

4.3.2 Derive Greater Value from Vendors

IT will continue to mature the vendor management program through the definition of a plan based upon consistent policies and processes. IT is heavily reliant on vendor products and services and this strong reliance requires that we remain good stewards of the City's operating and capital budgets. Improving vendor management will allow us to identify opportunities to negotiate lower costs, develop strategic relationships with high quality vendors, eliminate poorly performing vendors and ensure the City is obtaining value in exchange for financial outlay.

In collaboration with City Finance/Purchasing, IT will develop governance models for vendor management that establishes defined processes, guidelines and standards for how vendors are engaged, evaluated and managed in the organization. Clear and distinct roles and accountability for vendor management will also be identified and shared across the organization. A vendor management tool will be configured and maintained to report metrics for spending levels, response times, service level agreement compliance and performance issues.

Performance dashboards will be developed to visually communicate the metrics tracked for vendors. The dashboards will provide vendor scorecards that include actual and projected

spending levels, as well as performance history and other metrics as required by the organization.

4.3.3 Grow Project and Program Management

Programs and projects are the means by which the City implements its strategy through the delivery of new and expanded business solutions. Program and Project Management (PPM) is an essential function that guides and controls the execution of successful business and technology initiatives. Our department has identified opportunities to strengthen the program and project management discipline and has set an ambitious goal to exponentially mature these capabilities. IT is currently establishing a deliberate and actively managed process to transform this core capability. In partnership with City leadership and business units, we will focus on scalable and agile processes, enterprise-wide thinking, true portfolio management and strategic execution.

A PPM Center of Excellence (CoE) will be established with the mission of transforming the PPM organization. The CoE members will be responsible for identifying the most valuable and feasible means to strengthen leadership, standards, processes and training. The CoE members will review Gartner recommendations and attributes of highly effective organizations when forming the plan and identifying work to be completed.

4.3.4 Ensure Continuity of Operations Following a Disaster

The Office of Emergency Management (OEM) is responsible for maintaining a comprehensive Business Continuity Management program to mitigate the impacts from manmade, natural or technological disasters by utilizing mitigation, preparedness, response and recovery strategies. Our City has made great strides in establishing this program and IT is essential to the program's success.

IT has taken deliberate steps to improve our City's resiliency posture. We have improved data backup and recovery capabilities, upgraded data centers and instituting automated fail-over for some of its more critical systems. To continue the progress in this area, the City must ensure the ability to meet the Recovery Time Objectives (RTO) and Recovery Point Objectives (RPO) for systems and applications.

In collaboration with City businesses, we are conducting an as-is assessment of IT recovery readiness and performing a gap analysis to identify the skills, tools and technology that will be required to fill gaps and provide the capabilities needed to meet Continuity of Operations Plan (COOP) requirements. IT is developing a comprehensive Disaster Recovery Plan that will be tested on a defined schedule to ensure our capabilities fulfill our disaster-recovery responsibilities.

An Enterprise Data Center Strategy will be created to ensure success in ensuring continuity of operations following a disaster or an unplanned event. IT has determined our traditional, on-

premises data center model must transform to align with modern enterprise information management capabilities.

Traditional centralized/on-premise models are internally complex, manual, inefficient, costly and slow to adapt. It is imperative that we remove any dependency on the physical location of a datacenter facility. We must untether ourselves from the traditional data center model to increase our readiness to respond to any and all events. The City of Virginia Beach will pursue a hybrid infrastructure model that will simplify, standardize and rationalize based on key performance and security requirements. The hybrid IT model will be intelligent, software-defined and automated practically eliminating the need for manual or hands-on data center support. In contrast to the legacy tier-level design, our model will promote always available and will be service-defined. The model will be agile and flexible. It will be efficient and cost-effective making it easier to support our organization.

4.3.5 Enhance Security of Data Assets

We are committed to ensuring the City's security posture continues to meet the current and future needs of the City and its citizens. The City continues to look for ways to strengthen its information security architecture, posture and processes.

In order to advance the City's security posture, information security must become an integrated part of the City's business processes. To achieve an integrated approach the City will develop information security policies and procedures to ensure best practice frameworks are being implemented for networks, applications and other services. We will establish a policy and procedure review board that encompasses business stakeholders to ensure awareness, compliance and appropriate risk acceptance. Information security will also form collaborative relationships with its in-house development and data teams to ensure that information security is always at the forefront of the design and implementation process.

The City must also continue to adapt to the changing threat landscape by not only looking at integrating processes, but also integrating tool sets. Best of breed integrated tools such as continuous monitoring, threat hunting, incident management systems and vulnerability management systems allow the City to form a complete picture of the City's security posture at any given time. This allows metric and data driven decisions to be made while simultaneously decreasing time to detection and response to incidents.

As the City transitions to a hybrid operating model consisting of multiple data centers and a presence in multiple clouds ensuring the security of the data contained in those locations, especially cloud, becomes increasingly important. In order to maintain the City's security posture, we will explore and implement new polices as well as technology that can manage, monitor, audit, and automate detection and responses to potential threats along with integrating the City's existing security architecture and information security framework. This ensures that all City data locations are included in our security framework and that there is accountability for ourselves and our stakeholders.

In order to address the increasing demand for an agile and mobile workforce the City will be reviewing its policies and technologies that allow for remote access and remote work. We will explore how to best integrate endpoint protection, mobile device protection and remote access methods to the City's evolving security architecture. In doing so, the City minimizes the potential risks associated with devices being used outside of City networks along with the potential for theft of devices or data. We will also evaluate supporting policies in order to provide clear guidance with regards to security and use.

4.4 Infrastructure and Operations

IT continues the transformational progress to strengthen and modernize infrastructure systems and operations. We will continue to leverage revitalized technology assets to further transform, modernize and protect digital business capabilities in the City of Virginia Beach. Technology is rapidly evolving and it is essential that we remain vigilant in monitoring technology trends, refreshing hardware and patching systems.

Infrastructure & Operations Initiatives Alignment

City Council Strategy Alignment

21st Century Infrastructure

- **Improve the Transportation System**
- **City Assets and Infrastructure are Well Maintained and Meet Community Expectations**

Safe & Healthy Community

- **Be the Safest City in Virginia**

Growing Economic Opportunity

- **Grow the Local Economy**
- **Create a Financially Sustainable CIty, Providing Excellent Services**
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Bold text indicates Goal, Priority, Imperative alignment

4.4.1 Upgrade Infrastructure to Sustain our Assets & Mobile Workforce

Organizations are faced with infrastructure modernization challenges that involve server and network infrastructure, data storage, virtualization and facilities. Our infrastructure modernization efforts will encompass all of these with a focus on data center facilities, compute, storage and network infrastructure.

Network and infrastructure modernization will continue to support City Council strategic goals by providing the infrastructure that enables reliable and accessible City services. This initiative supports smart cities, resort area wireless capabilities, oceanfront public safety cameras, libraries technology, preparation for sea level rise and continued economic growth. Infrastructure components are the foundational element that enables our organization to provide a diverse and robust set of services to the City and its citizens. A resilient infrastructure supported by an effective operational model is the underpinning element that allows applications to run, enables the network to operate, facilitates communications and supports our services to residents, visitors and businesses.

Digital Equity will be a foundational component of our infrastructure modernization strategy and implementation plan. As we upgrade and expand our infrastructure investment, we will continuously evaluate the needs of our citizens and our workforce as we define, recommend and implement each initiative. We will continue to collaborate with our stakeholders including citizens, businesses and education institutions to evaluate the impacts of technology in our community to increase secured access and ensure the effective use of technology we deploy.

IT will continue to modernize network infrastructure to support increasing bandwidth requirements for business endpoint devices. With the emergence of the City's cable landing stations as a result of the transoceanic cable partnerships, it is critical that we develop a support and sustainment plan that will benefit the City and the region. Strategic alignment with business and industry to ensure that all infrastructure is modern and compatible with current and emerging broadband needs is critical to our success.

We will deploy resilient, secure and scalable public safety communications infrastructure that will include provisions to implement technologies capable of supporting virtual and back-up Emergency Operations Centers (EOC's). Expanding public safety radio communications channels will be enabled by migrating existing analog communication resources to our digital radio infrastructure, as well as mobile, portable and console devices. Public safety infrastructure is mission-critical and it will be maintained and continually modernized to provide persistent support and sustainment.

IT will continue to define, recommend and implement a digital business approach that will leverage new opportunities in an increasingly digital world. This initiative will provide new digital experiences that will continue to untether workers from desktop computing devices and will deliver relevant content to mobile users for better decision making and data entry in real time. This is enabled by the tools available through enterprise mobility management and virtual

desktop infrastructure that will provide our mobile workforce the opportunity to use any device, anytime and anywhere. Through this digital mobility initiative, IT will enable the instantaneous delivery of highly personalized content (such as application portals) to meet the dynamic and growing needs of our customers.

IT continues to build mobility into the City's infrastructure plan as it enables City Council goals and priorities by delivering City services in a cost-effective manner, providing ease of access and increasing citizen involvement and engagement. A robust mobile infrastructure is the foundational element that allows applications to run, enables remote network access, facilitates communications and supports City's services to residents, visitors and businesses.

The most significant test of our investments and resiliency was demonstrated during our City's COVID-19 pandemic response. The proactive investments of IT in network and infrastructure modernization initiatives supported the rapid migration of a large portion of the City's workforce to mobile and remote work service models. IT's proactive investments provided the foundation for the City's response to the pandemic and was able to scale and provide flexibility to meet the diverse requirements of our City's businesses.

Deployment of mobile infrastructure that enables end user computing outside the boundaries of traditional office workspaces will continue as we enable organizational initiatives and projects. City members will have access to enterprise resources hosted in the data center and the cloud and will have flexibility to use a diverse selection of mobile computing platforms that will generate business value, improve operational efficiencies and reduce overall costs to the organization.

A comprehensive approach will ensure computing, storage and network solutions are capable of scaling, supporting automation while increasing agility to ensure the needs of our digital mobile workforce are met. The modernization of mobile infrastructure will align to business needs, encompass new high-performance mobile computing capabilities and provide agile and adaptable service delivery.

We will implement mobile endpoint security to establish security best practices that will continue to protect the digital mobile workforce. Mobile workforce members outside of the City offices are exposed to threats that we cannot control internally. Solutions must be implemented to mitigate risks that did not exist prior to workforce mobility and an overarching security approach must be in place to address the elevated and unconventional threats that arise. Endpoint security focuses on protecting data and identities and will include managing, scaling and protecting mobile devices.

Automation, orchestration and self-service provisioning initiatives will allow our customers to be increasingly agile in the delivery of services and solutions while providing opportunities to leverage data analytics that will drive business value. This will limit the need for human intervention, reduce human error and increase self-service capabilities. The process

automation approach will further enable a digital workplace and will increase output capabilities and end user satisfaction.

4.4.2 Enable Regional Expansion through NGN Growth and Resiliency

The Next Generation Network (NGN) initiative focused on designing and building a carrier-grade optical fiber network. This first phase encompassed connecting a set of strategic locations, implementing network redundancy between six primary sites and connecting 60 remote sites to create the NGN network.

NGN Phase II construction activities will focus on expanding the existing fiber infrastructure by adding additional capacity, redundancy and resiliency. Our City will incorporate a middle-mile dark fiber strategy to leverage future regional, economic and educational opportunities and partnerships. A ‘middle mile’ strategy is developed when a municipality leases unused fiber to third parties. Additionally, this initiative will focus on growing our footprint in the areas targeted for private data center expansion, biomedical parks and transoceanic cable activities.

Expanding NGN infrastructure will support City Council goals for economic growth, higher education, public/private partnerships, business development and regional expansion. NGN makes our City a very attractive location for companies who will want to bring cables here via the transoceanic cable landing site. IT will expand the capabilities of NGN by increasing capacity and adding a level of redundancy and resiliency to leverage regional opportunities and foster economic growth for the City.

The expansion of the NGN footprint will continue into the future and will leverage opportunities available through emerging technologies such as biomedical parks, autonomous vehicles, smart City initiatives, higher education and regional wireless initiatives. Through this expansion, our City will be able to support subsea cable-landing activities, data center growth and promote the middle mile strategies for public and/or private partnerships.

Our City engaged with U.S. and international companies to build undersea cable landing sites in Virginia Beach. The subsea cables paired with the City’s modernized network infrastructure present new opportunities for regional growth. The new capabilities afforded by the cable landings are potentially transformational for our City and will establish Virginia Beach as the mid-Atlantic hub for transoceanic fiber communications. The City of Virginia Beach is not only a port City, but it is now a ‘Digital Port City’.

While we do not own the cables, their existence does enable new possibilities to move vast amounts of data at high speeds. Goals of the transoceanic strategy can include creating opportunities for internal, external, private and public partnerships. The synergies between the subsea cables and our City’s Next Generation Network (NGN) infrastructure will grow a fiber-ready region that will attract new businesses and high-paying jobs through new corporate headquarters, data centers and a large Biomedical Park. Other opportunities include development of a ‘Regional Connectivity Ring’, which will connect Hampton Roads cities to the

transoceanic cables, accelerate the growth of digitally empowered communities and serve as the foundation for smart regional development. This modern infrastructure can foster an ecosystem of low-cost internet service providers to meet the demand for affordable internet to address the digital divide. Our task is to work collaboratively to maximize NGN and subsea cable utilization to benefit our citizens, our City and our region.

Our stakeholders have recognized that such an initiative presents a great deal of opportunity to our region. Our region is well integrated and has always collaborated on economic development initiatives that benefit all. Given that our stakeholder partners have their own fiber networks and assets, it was decided that we would continue the tradition of collaboration and embarked on a journey to build out a robust, connected regional infrastructure.

Regional development requires a broader infrastructure that will be implemented in a phased approach starting with the five Southside cities of Portsmouth, Norfolk, Suffolk, Chesapeake and Virginia Beach. The second phase will expand in scope to include the broader region adding strategic partners and sites.

Constructing a fiber ring that connects Hampton Roads' government facilities and economic development target areas to a high-capacity network will create a range of benefits for government operations, public safety, higher education institutions and local economies.

The creation of a regional fiber optic ring will benefit the collective communities by supporting public safety grade communications and cybersecurity operations. It will enable long-term cost savings that protect against rising costs of connectivity while enabling shared services across the region. The regional fiber ring will create opportunities to establish local data centers and affordable connectivity to backup sites that provide for continuity of operations and business resiliency. The ring will serve as a platform for economic development including the expansion of new business incubators. The region will be well positioned to establish and grow technology parks and start-up clusters. Additionally, it will enable workforce training programs and workforce development activities that directly support the region's higher education institutions.

Our longer-term vision includes a regional fiber collaboration that will establish partnerships with other jurisdictions throughout the Commonwealth.

4.4.3 Modernize Security Infrastructure to Protect Data and Assets

The City will improve the ability to proactively address unforeseen security risks. Our focus will be to implement technologies and solutions that manage multiple security capabilities and are able to predict and react effectively to changes in technology, business needs and threat environments.

Strategic initiatives will be explored to evaluate and implement solutions that provide advanced threat detection, response and prevention capabilities. Concepts under consideration include a centralized security operations center or network operations center that will enhance security monitoring, threat and vulnerability detection and incident response management.

IT will develop a program to expand the integrity and security of corporate data by implementing a security program comprised of 24x7 monitoring, alerting, advanced threat detection and remediation.

A proactive security posture is paramount to ensure the integrity of our data and the availability of services delivered to our citizens. Infrastructure is the engine that enables an IT organization to provide a diverse and robust set of security services to our City and its citizens.

We will implement multifactor authentication as part of a security framework that will require two or means of identification in order to access the City network. By implementing this, we will be able to provide robust security that allows authorized users access to City data and assets but prevents attempts by unauthorized persons to gain access to City systems.

We will continue to modernize through the deployment of a next generation firewall to leverage emerging technologies that are capable of enhanced content filtering, detecting and blocking sophisticated attacks and enforcing security policies at the application, port and protocol level. The next generation firewall is an evolution in network security protections and is critical for defense against emerging threats to the City's data and assets.

In order to maintain continuity of operations, IT will introduce a program to expand the integrity and security of corporate data and assets to include a 24x7 security operations center, a network operations center, alerting, monitoring, advanced threat detection and remediation. This will allow for continual support of cyber security and monitoring that is critical to the organization and its infrastructure.

5 Conclusion

IT is leading the City's digital transformation to modernize infrastructure and business capabilities not only in our City but in our region and around the world. Throughout the development of the ETP, our focus has been on the people we serve – empowering our citizens and City employees with greater access, convenience and security through strategic investment planning and execution.

In close partnership with all City departments, IT created the ETP that represents the City's vision for our Information and Technology future. Our plan is aligned with City Council goals and their five strategies including 21st Century Infrastructure, Safe & Healthy Community, Growing Economic Opportunity, Thriving Neighborhoods and Innovative and Sustainable Government. We will leverage the power of data, information and technology to enable our organization to align and deliver collective results that support these priorities.

The successful execution of our technology strategy is dependent upon ongoing, City-wide collaboration, transparency and accountability to ensure the successful implementation of the 19 initiatives that have been documented in this plan.

IT is the differentiating factor that continues to enable the goals, objectives and priorities of our City Council, City Leadership and City Departments and as such, it will be the responsibility of the organization to commit to the successful implementation and funding of this plan.

We are well positioned to continue our transformational journey. In partnership with our City businesses, IT is prepared to embrace the challenges and opportunities while guiding our entire organization into our future.

The City of Virginia Beach is a Community for a Lifetime.

Strategic Plan Overview

City of Virginia Beach
Enterprise Technology Plan

The City of Virginia Beach's Vision for information and technology represented here identifies the foundational elements required to meet the established priorities of the organization.

Mission

The mission of Information Technology (IT) is to connect people to relevant technology solutions efficiently, quickly and consistently across the City of Virginia Beach.

Vision

IT is committed to proactively delivering dynamic services and innovative technologies on which the City depends.

We set and achieve high standards in Business and IT Alignment, Information Accessibility, Openness and Transparency, Civic Participation, Operational Efficiency, Quality Workforce, IT Security.

Strategies/Priorities

- 21st Century Infrastructure
- Safe and Healthy Community
- Growing Economic Opportunity
- Thriving Neighborhoods
- Innovative and Sustainable Government

Service Delivery

The goal of Service Delivery is to lead our city in the journey towards digital transformation. We will promote a citizen-centric approach as we identify, align and prioritize strategic investments whereby business processes will be transformed and resources allocated appropriately to achieve maximum taxpayer value and citizen satisfaction.

Business Solutions

The goal of Business Solutions is to leverage the power of mobility, data and automation to address big issues impacting our communities and preparing our city to embrace emerging opportunities of the future. We will continue to evolve as a smart city, empowering our community with information and technology that will enhance the end-to-end citizen and city employee experiences.

Governance

The goal of Governance is to ensure that our technology strategy remains aligned with City Council goals and priorities so to ensure that we deliver relevant results that empower citizens and city employees with greater access, convenience and enhanced security. A comprehensive governce model includes an enhanced continuity of operations plan that ensures resiliancy in our operating model while providing for the security of our data assets.

Infrastructure and Operations

The goal of Infrastructure and Operations is to upgrade the Ctiy's network to sustain mission-critical assets as well as our mobile workforce. Expansion of our regional footprint is essential to foster growth and resiliency throughout our City and the region. Modernizing security infrastructure that will continue to protect data assets is essential to success as we embrace emerging oportunities of the future.

"The ubiquitous power of data and technology will help us address some of the biggest issues impacting communities and position us for emerging opportunities. Our approach is local, regional and global. Our transformation is ongoing. Our resolve to think more deeply about the value we provide is evident. This plan tells the story of where we are, where we are going and how we will get there. Challenges will arise along the journey, but we believe IT is a worthwhile investment."

Peter Wallace
Chief Information Officer

Strategic Initiatives Reference

Service Delivery

- Promote a Citizen-Centric Approach — Page 14
- Transform Organization Culture — Page 15
- Enhance Resource Management — Page 16
- Improve Business Processes — Page 16

Business Solutions

- Implement a Customer Relationship Management System — Page 19
- Expand Access to Data — Page 19
- Leverage Mobile-Friendly Applications — Page 20
- Automate Services and Processes — Page 21
- Use Cloud Solutions to Improve Application Delivery — Page 21
- Invest in the Enterprise GIS Platform — Page 22
- Evolve as a Smart City Striving for Digital Equity — Page 22

Governance

- Ensure Technology Investments Align with Enterprise Strategy — Page 25
- Derive Greater Value from Vendors — Page 26
- Grow Program and Project Management — Page 27
- Ensure Continuity of Operations Following a Disaster — Page 27
- Enhance Security of Data Assets — Page 28

Infrastructure and Operations

- Upgrade Infrastructure to Sustain our Assets & Mobile Workforce — Page 31
- Enable Regional Expansion through NGN Growth & Resiliency — Page 33
- Modernize Security Infrastructure to Protect Data and Assets — Page 34

City of Virginia Beach

Information Technology