



**City of Portland, Oregon
Bureau of Technology Services**

Technology Standards Directory

**Fall 2017
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Introduction

Standards

Standards provide a consistent set of tools for the development and efficient maintenance of the City of Portland's Information Technology infrastructure.

A well-defined set of standards can reduce support costs and provide economies of scale while at the same time allowing the needed level of flexibility. Support costs can be minimized by setting standards for hardware, software, networks and backup technologies. Training costs can be reduced substantially by standardizing on certain applications that will have widespread use. Security risks can be reduced by ensuring products remain supported by the manufacturer for security related patches and fixes.

Technology Standards are maintained by the BTS Infrastructure Board with input from content experts in other BTS divisions and City bureaus. These standards reflect industry best practices as applicable to the requirements of the City of Portland. Minimum configurations reflect the hardware requirements necessary to easily use the applications included in the standard productivity suite. Bureaus may exceed the minimum configuration as specific work requirements dictate upon BTS review.

Standards related to certain Information Security services and capabilities are not publicly listed as a precaution against malicious use of, or exploitations against, City systems and networks.

These standards shall be posted on the BTS PortlandOregon.gov web site, updated as necessary and reviewed in accordance with the cycles established herein.

The BTS Technology Standards web page can be found at <http://www.portlandonline.com/omf/index.cfm?c=46940>.

Exception to Standards

All technology requests that do not conform to the technology standards established in this document will require approval as an exception. BTS customers must work with their [BTS Technology Business Consultant](#) to submit an exception request. Business Consultant involvement is important to assist the customer in considering standard alternatives.

The exception review process consists of validation of compatibility with the existing City standard infrastructure. Exception requests are reviewed by the BTS Infrastructure Board. BTS will work to process 80% of the exception requests within 2 weeks of the exception being entered into the exception tracking system. Some exceptions will take longer depending on the complexity and compatibility.

Products allowed via the exception process are generally not supported by BTS. BTS may bill for installation and configuration work on a Time and Materials basis.

Standard Categories

This document lists Technology Standards in categories as follows.

| Category | Description |
|---------------------------|---|
| Standard | This category represents the current accepted technology for general installation within the City technology environment. Technologies in this category are supported in the Enterprise and should be adopted at the earliest opportunity. |
| Allowed | Not a standard, but allowed in the environment without an exception. |
| Legacy | This category represents technologies that are legacy standards, previous releases or versions. These are typically outdated technologies that are approaching or at end of life, but are still in active use within the City's technology environment. These technologies will be eliminated from the environment through attrition or specific projects. New installation using a technology in this category requires a clear business justification and may require an Exception. |
| Exception Required | Technology requests that do not conform to the Technology Standards established in the Standards Directory will require approval as an exception. |

Note: Definition as a standard does not guarantee that BTS is providing technical support (via rates, time and materials or best effort) for the technology unless specifically noted in the support level.

Support Levels

BTS has established five standardized support levels:

| Support Level | Description |
|--------------------------------|--|
| Full Support | BTS fully supports the product including ordering, provisioning, installation, information security, configuration, troubleshooting, patching, de-installation and disposal. |
| Vertical Apps Support | BTS Vertical Applications team supports the product including installation, configuration, troubleshooting, patching (as requested by the customer bureau), bug fixes for in-house developed software, and disposal. |
| Limited Support | BTS supports the product including ordering, provisioning, installation, information security, de-installation and disposal. All other work is billable. |
| Bureau / Vendor Support | BTS does not support the product. Support is the responsibility of the customer bureau and/or the vendor. All work by BTS is billable with the exception of disposal. |
| No Support | BTS will order and/or provision the product, and dispose of it only. Any other BTS activity will be billable. |

| Support Level Code | BTS Support Level | | | | |
|---|-------------------|-----------------------|-----------------|-------------------------|------------|
| | Full Support | Vertical Apps Support | Limited Support | Bureau / Vendor Support | No Support |
| | Full | V.Apps | Limited | Bureau | No Support |
| Support Services | | | | | |
| Order / provision product – Order the product. In the case of cellular equipment, perform the initial setup (provisioning) of the device. | BTS | No | BTS | Bureau | BTS |
| Install the product (hardware and software) – Install the product on a server or workstation. | BTS | BTS | BTS | Bureau | Billable |
| Security Standards – Evaluate, implement, and periodically review related security standards. | BTS | Bureau | BTS | Billable | Billable |
| Software Install Point – Create a network location to house the software installation package. | BTS | BTS | Negotiated | Negotiated | No |
| Configure features of the product – Perform standard product configuration steps that are required. | BTS | BTS | No | Bureau | Billable |
| De-install the product – De-install the product, ensuring that remaining interfaces, security, configuration, etc. are intact. | BTS | Bureau | BTS | Bureau | Billable |
| Dispose of the product – Dispose of the product according to approved disposal protocol. | BTS | BTS | BTS | BTS | BTS |
| Troubleshoot problems – Working with the customer and/or vendor as needed, resolve issues with the product working in the environment. | BTS | BTS | Bureau | Bureau | Billable |
| | | | Billable | | |
| Track updates and patches to the product –Periodically check for updates and patches, and alert customers about availability. | BTS | Bureau | Bureau | Bureau | Bureau |
| Facilitate testing of updates and patches –Manage the testing process of updates and patches. | BTS | BTS | Bureau | Bureau | Billable |
| Apply updates and patches – Periodically package, distribute and/or implement updates and patches. | BTS | BTS | Bureau | Bureau | Billable |
| | | | Billable | | |
| Lifecycle Management –Manage lifecycle upgrades to the product. | BTS | Bureau | Bureau | Bureau | Bureau |
| Fix bugs for in-house developed software – BTS will track and fix SW bugs. | N/A | BTS | N/A | Bureau | N/A |
| Develop software enhancements for in-house SW – BTS will develop and implement new functionality as authorized and funded by the customer. | N/A | BTS | N/A | Bureau | N/A |

Key to Support Level table entries:

- BTS** BTS is responsible for the support service. The service is not billable.
- Bureau** The Bureau is responsible for the support service. Supplemental BTS assistance is billable.
- Negotiated** The Bureau negotiates with BTS for the support service. The service is billable.
- Billable** BTS bills for the support service.
- No** BTS does not provide the service.
- N/A** Not applicable.

Energy Efficiency

Energy efficiency is a criteria considered when selecting standards. As standards are selected, energy efficient products that meet the business needs and integrate with other established standards are selected when available.

Energy Star®

“As available, the City shall procure products that meet or exceed Energy Star® criteria for energy efficiency.” (City Code 5.33.080)

Energy Star® applicable products that are included in these Technology Standards shall meet the most current version of the Energy Star® program requirements in effect at the time the product is added to these Technology Standards. Those Bureaus that pursue and are granted an exception to these standards shall continue to seek Energy Star® qualified products.

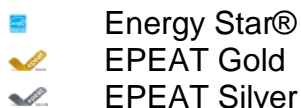
EPEAT

As available, for the following types of technology equipment, the City shall purchase EPEAT products registered at the “Silver” level or higher:

1. Desktop computers
2. Displays (Monitors) – under 60 inch diagonal
3. Laptop computers
4. Tablet computers
5. Printers

Any products from the above list that are included in these Technology Standards shall meet the most current version of the EPEAT standard in effect at the time the product is added to these Technology Standards. Those Bureaus that pursue and are granted an exception to these standards shall continue to seek EPEAT compliant products.

Energy Efficiency certification has been added where the information is available. Certified products are indicated by the following icons next to the product name.



BTS Standard Owner

Each defined standard has an assigned BTS Standard Owner. The owner is responsible for

- evaluating the products supporting a standard
- monitoring for patches, updates and end-of-life (EOL) model changes
- bringing patch and update projects forward to the IB and BTS management for action and scheduling

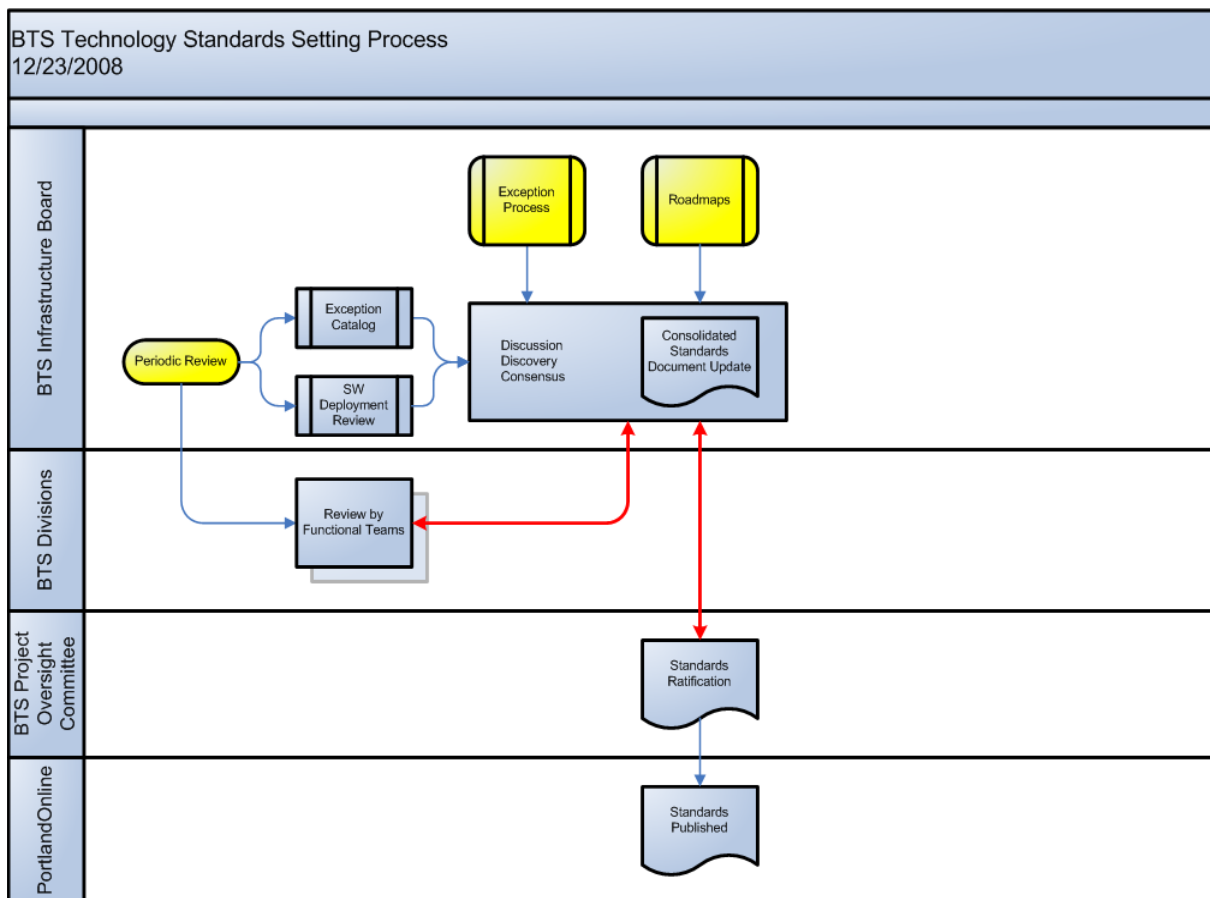
- alerting IB to EOL model changes in order to update this standards document
- working collaboratively within BTS to help establish important lifecycle dates and roadmap strategies.
- identifying when items need to be removed from the Legacy status.
- coordinating testing of products unless otherwise designated through a larger project.

The BTS Owner is not necessarily the group within BTS that provides technical support for the standard.

BTS Standards Setting Process

The following diagram illustrates the BTS standard setting and review process at a high level.

BTS will conduct a review of the standards 2 times per year in February and August. During the review, the Exception Catalog will be reviewed for any exceptions that should be included as standards; deployments of standard software will be reviewed; and standards that are prescribed from technology roadmaps will also be reviewed and incorporated as appropriate.



ADA Assistive Technologies







Several products have been included for use as ADA assistive technologies. These products have been identified in the document with the [ADA] tag. These products are also listed under the ADA index entry.

BTS worked with BHR to develop the list. The products were identified through discussion with external agencies such as Oregon Commission for the Blind, and review of products currently in use within the City infrastructure. While not an exhaustive list, it represents products thought to be most commonly used.

By including these products in the BTS Standards Directory, the need to submit an exception is eliminated, thereby streamlining the processes for acquisition.

Hardware Standards

1. Workstation Hardware









| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---------------------------------------|---|-------------------|---------------|---|
| 1.1. Desktop | Dell Optiplex 7050  | Standard | Full | Support Center / Hardware Standards Panel |
| | Dell Optiplex 755, 960, 780, 790, 7010, 7020, 7040 | Legacy | Full | |
| 1.2. Monitor | Dell - Flat Panel LCD P1917S 19" standard screen  , P2214H 22" widescreen  , U2415 24" widescreen  (Note that current inventory of U2412M will be consumed before purchasing U2415 monitors) U2717D 27" widescreen  , UP3017 30" widescreen  | Standard | Full | |
| | Dell P190S 19" standard screen P1913S 19" standard screen P1914S 19" standard screen P2210 22" widescreen P2212H 22" widescreen U2410 24" widescreen U2412M 24" widescreen U3014 30" widescreen | Legacy | Full | |
| 1.3. Keyboard | USB, 104-key | Standard | Full | |
| 1.4. Mouse | USB, optical wheel | Standard | Full | |
| 1.5. [ADA] Braille Display / Terminal | Freedom Scientific (Focus Blue) HumanWare (Brailiant) | Allowed | Limited | |

Workstation and Laptop Hardware Notes:


- The planned lifecycle replacement (LCR) for desktop workstations and laptop computers is 5 years effective July 2013 through 2019. The LCR cycle will reduce to 4 years beginning in 2020.

2. BTS does not recommend cascading workstations where a workstation that has been in use for its lifetime is moved to another desktop for continued use beyond the planned lifecycle. Any such request must be submitted as an exception request.
3. LCD panel monitors have a longer life cycle are typically run until failure.

2. Laptop Hardware

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---|--|-------------------|---------------|---|
| 2.1. Laptop | Dell Latitude 5490 (w/WebCam)  | Standard | Full | Support Center / Hardware Standards Panel |
| | Dell Latitude 5480, E5440, E5450, E5470, E64xx, E65xx, D6xx | Legacy | Full | |
| Police | Dell Latitude 7490  | Standard | Full | |
| | Dell Latitude 7480, E7440, E7450, E7470 | Legacy | Full | |
| 2.2. Laptop – “Lite | Dell Latitude 7390  | Standard | Full | |
| | Dell Latitude 7280, D4xx, E4200, E62xx, E7240, E7250, E7270 | Legacy | Full | |
| 2.3. Laptop – Rugged | GETAC B300  | Standard | Full | |
| | Dell Latitude E64xx XFR, 64xx ATG & XFR, D630 ATG, ATR & XFR | Legacy | Full | |
| Police, Fire, PBEM Note: Toughbooks have historically been used by BES and Water also. | Panasonic Toughbook 19  Panasonic Toughbook 31  Panasonic Toughbook 53  | Standard | Full | |
| | Panasonic Toughbook PDRC (dash mounted monitor and wired keyboard) | | | |
| | Motorola MW520 | Legacy | Full | |
| 2.4. Mobile Data Computer – Fire | Panasonic Toughbook GETAC B300  | Standard | Full | |
| | Data 911 M6, M6 II, PM2, PM1, ETX-PM1, 19 | Legacy | Full | |
| 2.5. Laptop – Convertible | Dell Latitude XT | Legacy | Full | |

3. Tablet Hardware

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-----------------------|--|-------------------|---------------|--|
| 3.1. iOS ¹ | Apple iPad Mini 3, Mini 4, iPad Pro, iPad, iPad with Verizon data plan | Standard | Limited | Communications / Telecom Engineering and Support |
| | Apple iPad 2, 3, 4, Mini, Mini 2, Air, Air 2 | Legacy | Limited | |
| 3.2. Windows 10 | Microsoft Surface Pro 4 (WiFi only) | Standard | Limited | Support Center / Hardware Standards panel |
| Police | Panasonic Toughpad FZ-G1  | Standard | Full | Police |

Tablet Hardware Notes:

- iPads may be purchased without a data plan, however BTS requires that both WiFi and Cellular radios be purchased in the device. This configuration does not require an exception. If a data plan is added at a future date, it must be through cellular services managed by BTS.
- The End User License Agreement (EULA) for the Dictation feature of the iPad states that all dictation content is sent to Apple for processing to text. This content may be stored as audio files. Additionally your first name and nickname, and similar information including relationship with you (e.g., “my dad”) from your address book contents are also sent to Apple. This information is retained and used by Apple as part of the service and may be retained by Apple even if Dictation is returned to an “Off” setting. This content is subject to Oregon Public Records law and City record retention requirements. See *State and City Rules Related to Public Recordkeeping Requirements* (<https://www.portlandoregon.gov/archives/70031>) on the Auditor’s PortlandOregon.gov website. **BTS STRONGLY ADVISES AGAINST USING THIS FEATURE. DICTATION MUST NOT BE USED AS A DATA ENTRY METHOD FOR CONFIDENTIAL OR SENSITIVE DATA.**
- iPads are provisioned from BTS with the Dictation feature turned Off.
- Tablets are not covered by life cycle replacement funding because of the expectation of a relatively short lifecycle.**
- Please see the document [Apple Device Support Dates](#) on [PortlandOregon.gov](#) for iPhone and iPad devices that are no longer able to receive iOS updates.**

¹ Smartphone and Operating System Limited Support: Ordering, initial device provisioning, setup of synchronization with Exchange, Verizon data and voice service.

4. Server Hardware

| Item | Standard Description | Category | Support Level | BTS Owner |
|--------------------|--|----------|---------------|--------------------------------------|
| 4.1. Windows based | Dell, PowerEdge R630, R730 | Standard | Full | Production Services / Server Support |
| | Dell PowerEdge R900, R610, R620, R710, R720, R910, 2950 III, 1950 III, 1950, 2950. | Legacy | Full | |
| 4.2. Red Hat based | Dell PowerEdge R630, R730 | Standard | Full | |
| | Dell PowerEdge R900, R610, R620, R710, R720, R910, 2950 III, 1950 III, 1950, 2950 | Legacy | Full | |
| 4.3. AIX based | IBM p-Series/Power 8 | Standard | Full | |
| | IBM p-Series/Power 6, p-Series/Power 7 | Legacy | Full | |
| 4.4. Blade Server | IBM Note: Blade servers will be fully retired as part of the 2017 migration of the data center. | Legacy | Full | |

Server Hardware Notes:

1. The planned lifecycle for server hardware is 5 years.

5. Network Protocols

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-------------------------------------|---------------------------------------|-------------------|---------------|--|
| 5.1. Transport | TCP / IP (IPv4, IPv6) | Standard | Full | Communications / Network Engineering and Support |
| 5.2. Routing | OSPF, BGP4, EIGRP | Standard | Full | |
| 5.3. eMail | SMTP, TLS | Standard | Full | |
| 5.4. Monitoring | SNMP V2c, SNMPv3, WMI | Standard | Full | |
| 5.5. WiFi Radio | 802.11ac 802.11n (2.4 GHz / 5 GHz) | Standard | Full | |
| | 802.11b/g | Legacy | Full | |
| 5.6. Line Negotiation – Workstation | Auto / Auto | Standard | Full | |
| 5.7. Line Negotiation – Server | Auto / Auto | Standard | Full | |

6. Network Connectivity

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--|--|-------------------|---------------|--|
| <p>6.1. Cabling</p> | <p>Horizontal: UTP Cat 6, Cat 6a, Cat 7 Vertical: Fiber – Single or Multimode OM3 Patch: UTP Cat 6, Cat 6a, Cat 7, Fiber Copper patch cables should be hoodless.</p> <p>Office or Cubicle See additional notes in the Specifications section on page 48.</p> <p>New construction: 2 - Cat 6A. May be used for either voice or data as needed.</p> <p>Remodel: Will be evaluated case by case due to other constraints.</p> | Standard | Full | Communications / Network Engineering and Support |
| | <p>Horizontal: UTP Cat 5e Patch: UTP Cat 5e</p> | Legacy | Full | |
| <p>6.2. WAN</p> | <p>T1, IRNE, INET, Freewire wireless, point-to-point fiber (gigabit), Metro Ethernet, DWDM.</p> | Standard | Full | |
| <p>6.3. SONET</p> | <p>Cisco 15454, 15310</p> | Standard | Full | |
| <p>6.4. 10 Gigabit Ethernet</p> | <p>ONS 15454 GE-XP/XPE CROSSPONDER, M6</p> | Standard | Full | |

7. Network Routers

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-----------------|--|-------------------|---------------|--|
| 7.1. Router | Cisco ME-3400e, ME-3600X, 3850, 4321, 4331, Nexus 7000, ASR. Arista 7280 | Standard | Full | Communications / Network Engineering and Support |
| | Cisco 1841, 1921, 1941, 3750, 3750-X, 7206 | Legacy | Full | |
| 7.2. Components | Cisco T1 DSU/CSU WICS | Standard | Full | |
| | 4-port Ethernet card | Legacy | Full | |

8. Network Switches

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-----------------|---|-------------------|---------------|--|
| 8.1. Switch | Cisco 2960C, 2960S, 3560C, ME-3400e, ME-3600X, 3850, 4500-x, Nexus 2000, 5000, 6001. Arista 7050. | Standard | Full | Communications / Network Engineering and Support |
| | Cisco 2950 (DC), 2960, 3750, 3750-X, 6500 | Legacy | Full | |
| 8.2. Components | Cisco SFP connectors | Standard | Full | |

9. Plotters

Plotter Notes:

BTS has not established standard plotter models due to the diverse needs of the individual uses in each bureau. All plotter orders must go through the exception process. Please contact the Technology Business Consultant for the requesting bureau.

10. Printers (Network)

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|------------------------------------|--|-------------------|---------------|---|
| 10.1. Laser | Monochrome: HP M402dne HP M506dn HP M607dn HP M608dn HP M608x Color: HP M452dn HP M553dn/x HP M653dn | Standard | Full | Support Center / Hardware Standards Panel |
| | HP 700, 1320, 3505, 4350, 9050, CP3525, CP4525, CP6015, M401, M451, M551, M601, M602, M604, M605, M651, P2055, P3015, P4015 | Legacy | Full | |
| 10.2. Large Format Laser – 11 x 17 | Monochrome: HP M712dn Color: HP M750dn HP M855xh HP CP5225dn | Standard | Full | |
| | CP6015, 9050 | Legacy | Full | |
| 10.3. Small Multi-function Laser | Monochrome: HP M227dfn HP M426dn HP M725dn Color: HP M47dnf | Standard | Full | |
| | HP M225, M425, M475, M476, CM1312, M1522, M1536, CM2320, M2727 | Legacy | Full | |

11. Scanners

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|------------------------------------|--------------------------------------|-------------------|---------------|---|
| 11.1. Workstation – flatbed, color | HP ScanJet 7500 | Standard | Full | Support Center / Hardware Standards Panel |
| | HP 8390, HP 8350, HP N8420, HP N8460 | Legacy | Full | |
| | Canon DR-225C Canon DR-M160ii | Standard | Full | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---|---|-------------------|---------------|-----------|
| 11.2. Workstation – sheet-fed, color | Canon DR-125C, DR-160, DR-2050C, DR-3080CII, DR-2010C, DR-4010C, DR-6010C | Legacy | Full | |
| 11.3. Workgroup – flatbed, color, network attached | HP ScanJet Pro 4500 | Standard | Full | |
| | HP N6350, 7650n | Legacy | Full | |
| 11.4. Large Format – 11 x 17 | Canon DR-6030C | Standard | Full | |
| | HP N9120 Canon DR-7090C | Legacy | Full | |

12. Search Appliance

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-------------------------------|----------------------|-------------------|---------------|--------------------------------------|
| 12.1. Search Appliance | SwiftType | Standard | Full | Business Solutions / Web Development |

13. Storage Area Network

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--------------------------------------|---|-------------------|---------------|--|
| 13.1. Storage Array | Hitachi Gx00 | Standard | Full | Production Services / Storage Administration |
| | Hitachi HUS | Legacy | Full | |
| 13.2. SAN Fabric Network | Fiber Channel Switch: <ul style="list-style-type: none"> • Brocade DCX8510 • Brocade 6520 | Standard | Full | |
| | Wide Area Mux: Cisco CWDM | Legacy | Full | |
| 13.3. NAS Gateway | Hitachi HNAS | Standard | Full | |
| 13.4. NAS file System Support | CIFS, NFSv3 | Standard | Full | |
| 13.5. SAN Replication | FCIP | Standard | Full | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-------------------------------------|--|-------------------|---------------|-----------|
| 13.6. SAN Routing Protocol | FSPF | Standard | Full | |
| 13.7. SAN Transport Protocol | Fiber Channel | Standard | Full | |
| 13.8. File Sharing | HCP Anywhere – for two specific use cases <ul style="list-style-type: none"> Files larger than 15 GB Elevated security protocols | Standard | Full | |

14. Telecommunications

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--------------------------------------|--|--------------------|---------------|---|
| 14.1. Satellite Phones | Iridium 9555 Associated address book SW will likely be installed on 1 or 2 workstations in a bureau to manage bureau’s sat phone fleet. | Standard | Full | Communications / Telecom Engineering and Support |
| 14.2. Broadband Wireless | Dell 5600 Gobi Mobile Broadband mini-card Verizon JetPack MiFi 7730L | Standard | Full | Communications / Telecom Engineering and Support (except for Police Specific) |
| | Verizon USB 760 Verizon Aircard (EVDO) Verizon MiFi 4620LE Verizon MiFi MHS291L VeriZon MiFi 620L | Legacy | Full | |
| Broadband Wireless Police | Panasonic Sierra Wireless MC 7750 Panasonic Sierra Wireless EM 7355 | Standard | Full | |
| 14.3. Pagers: Emergency | 1-WayUSA/Mobility, Cook | Standard | Full | |
| 14.4. Pagers: Non-Emergency | 1-Way: USA/Mobility, Cook 2-Way: USA/Mobility | Standard | Full | |
| 14.5. Smartphone ² | Motorola Droid 4 Samsung Galaxy S5 Samsung Galaxy S6, S7 (Police) | Exception Required | Limited | |

² Smartphone and Operating System Limited Support: Ordering, initial device provisioning, setup of synchronization with Exchange, Verizon data and voice service.

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---|--|---------------------------------|---------------|--|
| | iPhone 5s, 6, 6 Plus, 6s, 6s Plus, SE, 8, 8 Plus | Standard | | |
| | Motorola Droid 3 Motorola Droid X2 Motorola Droid RAZR M iPhone 4s, 5, 5c, 7, 7 Plus Note: Please see the document Apple Device Support Dates on PortlandOregon.gov for iPhone and iPad devices that are no longer able to receive iOS updates. | Legacy | Limited | |
| 14.6. Smartphone Operating System | Android 4.0, 5.0 (Galaxy S5 only) Android 6.0, 7.0 (Police) iOS 12.0.1 | Exception Required | Limited | |
| | Android 2.3 iOS 4, 5, 6, 7, 8, 9, 10, 11 Windows Mobile 5, 6.0, 6.1, 6.5 Blackberry | Legacy | Limited | |
| MDC/Cellular Phone (Police Traffic Division) | Trimble Nomad (WIN mobile 6.5 PRO) | Legacy | Full | |
| 14.7. Basic Cellular Phone | LG VN150s Samsung Convoy 3 (Ruggedized) Samsung Intensity III (basic w/slide out keyboard) | Standard | Full | Communications / Telecom Engineering and Support |
| 14.8. USB Wireless Cellular Data Modem | Verizon 730L Pantech 290, 295, 620L | Standard Legacy | Full Full | |
| 14.9. Tablet | | See Tablet Hardware on page 13. | | |
| 14.10. [ADA] Compliant Handset | CapTel 840i | Standard | Full | Communications / Telecom Engineering and Support |
| 14.11. Cellular Micro Cell | Verizon Network Extender Appliance | Standard | Full | |

15. Tape

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--------------------|----------------------|-------------------|---------------|--------------------------------------|
| 15.1. Tape Format | LTO4 | Legacy | Full | Production Services / Server Support |
| 15.2. Tape Library | IBM 3494 Library | Legacy | Full | |

16. Video

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---|--|-------------------|---------------|---|
| 16.1. Desktop USB Camera | Logitech c925-e Microsoft LifeCam Studio 1080p HD | Standard | Full | Support Center / Hardware Standards Panel |
| | Logitech QuickCam Pro9000, c910, c920 | Legacy | Full | |
| 16.2. Projector, Portable | InFocus IN116xa, IN2128HDx | Standard | Full | |
| | Dell M209X, M210X, 1510X, 2400mp InFocus IN116, IN116a, IN116x, IN3118HD, HD3138HD, IN3138HDa | Legacy | Full | |
| 16.3. Projector, Ceiling mount | No standard specified Specific characteristics of the room must be taken into account. Ambient light, screen size, and projector brightness (lumens) must be matched to provide acceptable image quality. See video specifications on page 49. | N/A | | Communications / Radio and Video Shop |
| 16.4. Digital Video Recorder (DVR) | PELCO DSSRV-030-US Note: This is a digital recorder. Additional encoders may be required depending upon the type of cameras used. | Standard | Full | |
| | PELCO DX8100s, DSSRV-005-US Custom built "white" box supported by BTS Radio and Video Shop. | Legacy | Full | |
| Digital Video Recorder (DVR) Police | HIKVision DVR | Standard | Full | |
| 16.5. Digital Video Recorder Control Software | PELCO ControlPoint | Standard | Full | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--|-----------------------------|--------------------------|----------------------|------------------|
| Digital Video Recorder Control Software Police | Interview Tracker | Standard | Full | |

Software and Application Development Standards

17. Application Development Tools

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|----------------------------|--|-------------------|---------------|--|
| 17.1. Editing/Compiling | PLEdit 5.7 PL/SQL Developer 7.1 Oracle SQL Developer SQL Server Management Studio | Standard | Full | Business Solutions / Vertical Applications |
| | Editing / Compiling Police SQL Server Management Studio 2014 | Standard | Full | |
| 17.2. HTTP Posting Tool | Fiddler 2 | Standard | Full | |
| 17.3. Query Tool | Golden 5.7 Toad 12 | Standard | Full | |
| | Toad 9.1 | Legacy | Full | |
| 17.4. SQL Server Utilities | Baretail Pro Redgate SQL Compare Utilities 9.0 SQL Server Management Studio 2016 | Standard | Full | |
| | SQL Server Management Studio 2008, 2012, 2014 | Legacy | Full | |
| 17.5. XML Editor | Notepad++ 7.x, XML Notepad 2007 | Standard | Full | |

18. Application Development Tools – Windows-based

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-----------------------|---|-------------------|---------------|--------------------|
| 18.1. Multi-platform | Visual Studio 2017 ColdFusion Oracle J Developer Eclipse | Standard | Full | Business Solutions |
| | Visual Studio .NET 2003, 2005 Visual Studio 2008/2010/2012 | Legacy | Full | |
| 18.2. Client / Server | Visual Studio 2017 | Standard | Full | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--------------------------------|---|-----------------------|---------------|-------------------------------|
| | Access XP Developer PowerBuilder Visual Studio 6.0 VS.NET 2003, 2005, 2008, 2010, 2012 | Legacy | Full | |
| 18.3. Workstation Based | Access 2016 | Standard | Full | |
| Workstation Based Police | Access 97, 2000, XP, 2013 | Legacy | Full | |
| | Access 2013 | Standard | Full | |
| | Cognos Impromptu Actuate Crystal Reports 2013 Business Objects Enterprise 4.3 SQL Server Reporting Services 2008, 2008 R2, 2012, 2014, 2016 | Standard | Full | |
| | Crystal Reports 8, 9, 10, 11, 2008, 2011 | Legacy | Full | |
| 18.4. Reporting Tools | Tableau Creator which includes Tableau Desktop and Tableau Prep Tableau Explorer Tableau Viewer Tableau Reader – note that Reader cannot access information on Tableau Server, Online or Public. Tableau Online | Allowed | Limited | Enterprise Business Solutions |
| | Tableau Public | Exception Required | No Support | |
| 18.5. OLAP | SQL Server OLAP Service SAP BW 7.40 Cognos | Standard | Full | |
| 18.6. Installer | InstallAware InstallShield Windows Installer | Standard | Full | Business Solutions |

19. Application Server

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---------------------------------|--|-------------------|---------------|--|
| 19.1. Application Server (Java) | Tomcat 8.x Oracle WebLogic 12c WebSphere | Standard | Full | Production Services/Business Solutions |
| | Oracle WebLogic 11g Oracle 10g AS | Legacy | Full | |

20. Backup / Recovery Software

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|------------------------|---|-------------------|---------------|--------------------------------------|
| 20.1. Backup Software | Tivoli – AIX (SAP only) CommVault – Windows / Red Hat Linux / AIXHat/AIX | Standard | Full | Production Services / Server Support |
| | Quest Litespeed – SQL | Legacy | Full | Business Solutions |
| Backup Software Police | Symantec Backup Exec 2015 | Standard | Full | |

21. Collaboration Tools

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-------------------------------------|--|-------------------|---------------|---|
| 21.1. Online Conferencing | Skype for Business with British Telecom Audio connectivity to the public telephone system | Standard | Full | Support Center / Software Standards Panel |
| | WebEx Go-To-Meeting (as a participant only) | Allowed | No Support | |
| 21.2. Conference Recording Playback | WebEx Player (ARF format) WebEx Player (WRF format) | Allowed | No Support | |

22. Database Standards

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-----------------------------------|--|-------------------|---------------|---|
| 22.1. Enterprise Database | Informix 12 Oracle 12c SQL Server 2012 SQL Server 2014 SQL Server 2016 PostGreSQL | Standard | Full | Oracle Production Services SQL: Production Services/Business Solutions |
| | SQL Server 2008 SQL Server 2008 R2 SQL Server 2005 SQL Server 2000 Oracle 11g | Legacy | Full | |
| 22.2. Enterprise Database Client | Oracle 12c Client | Standard | Full | Business Solutions |
| | Oracle 11g client | Legacy | Full | |
| 22.3. Workstation Based | Access 2013 | Standard | Full | |
| | Access 97, 2000, XP | Legacy | Full | |
| Workstation Based Police | Access 2010 | Standard | Full | |
| 22.4. Database Connector Protocol | ODBC OLE DB XML JDBC ADO | Standard | Full | |

The BTS Infrastructure Board recommends that primary and shadow copies of databases in production operate on the same version of the database engine. All copies in the production environment should be updated as part of a planned migration when non-production development and testing validate that the application works correctly in the new database version.

23. Directory Services

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--------------------------|----------------------------|-------------------|---------------|--------------------------------------|
| 23.1. Directory Services | Microsoft Active Directory | Standard | Full | Production Services / Server Support |

24. eMail

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---|--|-------------------|---------------|--------------------------------------|
| 24.1. Server Software | Microsoft Office 365 Exchange Online Exchange Server 2013 (Police) | Standard | Full | Production Services / Server Support |
| | Exchange 2007, | Legacy | Full | |
| 24.2. Web Client | Microsoft Office 365 Outlook Web App | Standard | Full | |
| 24.3. eMail Synchronization | Microsoft Office 365 Exchange Online built-in | Standard | Full | Support Center / System Engineering |
| 24.4. Mail Client Mail Client Police | Outlook 2016 | Standard | Full | |
| | Outlook 2013 | Standard | Full | |
| 24.5. Address Book | Global Address Book – Required field: last name, first name, alias, internal and external SMTP address, phone, company, department, office, display name, name (last, first), fax # | Standard | Full | |
| 24.6. Bulk Email Service | MailChimp | Allowed | No Support | |
| 24.7. eMail Filing Tool | SimplyFile | Allowed | No Support | |

25. Geographical Application Tools

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-----------------------------------|---|-------------------|---------------|--------------------|
| 25.1. GIS Desktop Applications | ArcGIS 10.3.1 MapWorks 10.3.1 | Standard | Full | Business Solutions |
| | ArcView 3.3/3.4 Microstation (MGE) MapInfo GeoOutlook | Legacy | Full | |
| 25.2. GIS Internet Map Server | ArcGIS Server 10.2.2 | Standard | Full | |
| | GIS/SQL | Legacy | Full | |
| 25.3. GIS Application Development | Visual Studio 2010, 2015, 2017 ArcObjects 10.1, 10.2, 10.3 ArcEngine 10.1, 10.2, 10.3 | Standard | Full | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-------------------------------|---|-------------------|---------------|----------------|
| | Eclipse XCode | | | |
| | Visual Studio .NET 2003, 2005, 2008 MapObjects AML Visual Basic 6 Visual Basic for Applications | Legacy | Full | |
| 25.4. Mapping Software | Google Earth \ Google Earth Pro (free version) | Standard | Limited | Support Center |

26. Graphic Design Software

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---------------------------------|--|-------------------|---------------|---|
| 26.1. Visual Diagramming | Microsoft Visio 2013, Visio 2016 Click-to-Run Perpetual License | Standard | Full | Support Center / Software Standards Panel |
| | Microsoft Visio 2007, 2010 Notes: <ul style="list-style-type: none"> as of 6/11/2013 BTS adopted a policy to allow owners of 2007 or 2010 versions to install and use those versions through their lifecycle. | Legacy | Full | |
| 26.2. PDF Creation | Adobe Acrobat Standard or Professional DC Adobe LiveCycle Designer Office 2013 built-in | Standard | Full | |
| | Adobe Acrobat Standard or Professional 9, 10, XI PDFCreator | Legacy | Full | |
| 26.3. Graphic Design | Adobe Creative Suite 6 (InDesign, Photoshop, Illustrator, Flash, DreamWeaver, Fireworks, Premier Pro) Adobe Photoshop Elements Adobe Premier, Premier Elements Microsoft Publisher 2013 XnView | Allowed | Limited | |
| | Adobe Creative Suite 1, 2, 3, 4, 5, 5.5, Publisher 2003, 2007, 2010 | Legacy | Limited | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|------------------------------------|--|-------------------|---------------|-----------|
| Graphic Design police | Microsoft Publisher 2013 Sony Vegas 15 Pro (Police) | ? | | |
| 26.4. Screen Capture | Camtasia Greenshot Snagit | Allowed | Limited | |
| 26.5. Computer Aided Design | Sketchup Pro Sketchup Make | Allowed | Not Supported | |

27. Internet Domain Naming

BTS recommends bureaus use the form *www.portlandoregon.gov/function* when creating internet domain names for specific functions to be exposed to the public. This form maintains city branding (portlandoregon.gov) and does not incur any additional domain registrar costs provided a security certificate is not required.

Bureaus may also use the form *function.org* or *function.com* as business reasons dictate. If this option is chosen, these new domain names must be created, registered, and maintained by BTS. Bureaus must always consult with and acquire domain names through BTS to ensure the domain name is known and cataloged centrally. This reduces the chance that a domain name will expire without the City’s knowledge.

28. Miscellaneous Tools

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--|--|-------------------|---------------|---|
| 28.1. Enterprise Fax | AccuRoute FAX | Standard | Full | Production Services / Server Support |
| 28.2. Enterprise Paging | OmniTrend PageMaster | Standard | Full | |
| 28.3. FTP Client | FileZilla (http://filezilla-project.org) Internet Explorer Note: See Storage Services and Devices on page 37. | Standard | Full | Support Center / Software Standards Panel |
| 28.4. Kiosk | | | | |
| 28.5. Online Training Content Editing | Adobe Captivate | Standard | Full | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--|---|-------------------|---------------|---|
| 28.6. Outlook Calendar Publishing | WinCalendar Standard | Allowed | Limited | |
| 28.7. [ADA] Speech to Text | Dragon Naturally Speaking | Standard | Limited | Business Solutions |
| 28.8. Survey Application | Survey Monkey (web application) | Allowed | Limited | Support Center / Software Standards Panel |
| 28.9. Terminal Emulation (3270) | Micro Focus Reflection Desktop 2016 OpenText Exceed OpenText HostExplorer | Allowed | Limited | Production Services / Data Center |
| | Reflection 2011 Attachmate Extra Extreme | Legacy | No Support | |
| 28.10. Wiki | ScrewTurn Wiki TikiWiki | Standard | Full | Business Solutions Production Services |
| 28.11. SMS Text Message Capture | Macroplant iExplorer SMARSH Note: iMessage must be disabled on iPhones to force text messaging via SMS through the Verizon carrier. Text messaging in iPads via iMessage is not to be used. | Allowed | Limited | Enterprise Architecture |
| 28.12. [ADA] Text to Speech | Screen Readers JAWS NVDA Text Only TextHelp | Allowed | Limited | Enterprise Architecture |
| 28.13. [ADA] Screen Magnifier | ZoomText MAGic | Allowed | Limited | Enterprise Architecture |
| 28.14. [ADA] Video Remote (Language) Interpreting | LanguageLine | Allowed | No Support | Enterprise Architecture |
| 28.15. [ADA] Video Relay Service | Convo ZVRS | Allowed | Limited | Enterprise Architecture |

29. Operational Support Tools

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---|---|-------------------|---------------|--|
| 29.1. Work Order Ticketing | Cherwell | Standard | Full | Support Center / SET |
| 29.2. Software Distribution | Altiris Client Management Suite | Standard | Full | |
| 29.3. Workstation Remote Control | ABomgar | Standard | Full | |
| 29.4. Automated Inventory | Altiris Client Management Suite (desktop) SNOW License Manager 7 (server) | Standard | Full | |
| 29.5. Asset Inventory | Altiris Asset Management | Standard | Full | |
| 29.6. Server Remote Control | Microsoft Remote Desktop Services (RDS) | Standard | Full | Production Services / Server Support |
| 29.7. Monitoring | Toad for Oracle DBA V11 | Standard | Full | Production Services / Database Administration |
| | Microsoft SCOM Oracle OEM/Grid Control OpManager Server Studio SQL Server Management Studio 2008, 2008 R2, 2012, 2014, 2016 VMware vROPs | Standard | Full | Production Services / Server Support & Database Administration |
| | Brocade Network Advisor Hitachi Tuning Manager HVSR | Standard | Full | Production Services / Storage Administration |
| | Cacti NetDisco OpenNMS PAESSLER PRTG Network Monitoring (Police) 17.1 Sitescope SolarWinds GrayLog (syslog) WMI | Standard | Full | Communications / Network Engineering and Support |

30. Project Management Tools

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---|--|-------------------|---------------|---------------------------|
| 30.1. Project Management Software | Microsoft Project 2016 Project 2016 Click-to-Run Perpetual License Notes: <ul style="list-style-type: none"> With Office 365 2016, Microsoft blocks installation of Office 365 2016 simultaneous with the shrink-wrap version of Project 2016. If Project 2016 is to be used, the subscription version must be installed. Project 2013 or 2010 may be installed simultaneously. | Standard | Full | Project Management Office |
| | Microsoft Project 2010, 2013 Notes: <ul style="list-style-type: none"> as of 6/11/2013 BTS adopted a policy to allow owners of 2010 or 2013 versions to install and use those versions through their lifecycle. | Legacy | Full | |
| 30.2. Project Portfolio Management (PPM) Software | Innotas PPM | Standard | Full | |

31. Server Base Software

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|------------------------|---|-------------------|---------------|--------------------------------------|
| 31.1. Operating System | Windows Server 2012 R2 64-bit Windows Server 2016 64-bit | Standard | Full | Production Services / Server Support |
| | Windows Server 2008, 2008R2, 2012 | Legacy | Full | |
| | Red Hat Enterprise 7.x | Standard | Full | |
| | Red Hat Enterprise 6.x; | Legacy | Full | |
| | AIX 8.x AIX 7.x | Standard | Full | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--|--|-------------------|---------------|-----------|
| | AIX 6.x | Legacy | Full | |
| 31.2. Base Software (Windows) | MS IE 11 Windows Remote Desktop McAfee Snow | Standard | Full | |
| | MS IE 8, 9, 10 | Legacy | | |
| 31.3. Virtualization Hypervisor | VMWare VSphere 6 IBM VIO | Standard | Full | |

32. Source Code Control System

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-----------------------------|---|-------------------|---------------|--------------------|
| 32.1. Source Control | Subversion/VisualSVN 2.1.10 TortoiseSVN 1.6.16 AnkhSVN 2.1 Visual SourceSafe 2005 git | Standard | Full | Business Solutions |
| | Visual SourceSafe 6.0 | Legacy | No Support | |

33. Web Tools

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--|---|-------------------|---------------|--------------------|
| 33.1. Content Management and Page Development Tools | DreamWeaver City Site / Content Management Tool (Portland Online) Eclipse | Standard | Full | Business Solutions |
| | Cold Fusion Studio | Legacy | Full | |
| 33.2. Site Management Tools | DreamWeaver | Standard | Full | |
| 33.3. Runtime Environment Tools | ColdFusion Server MX Java SQL Server Reporting Services 2008, 2008 R2, 2012, 2014, 2016 | Standard | Full | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|--|---|-------------------|---------------|----------------|
| 33.4. Web Application Development | Visual Studio 2017 Cold Fusion Studio Oracle J Developer Eclipse | Standard | Full | |
| 33.5. HTML Version | HTML 4.0 | Standard | Full | |
| 33.6. Scripting Languages | PERLVBScript.NetJavaScriptColdFusion Python 2.5, 3.x | Standard | Full | |
| 33.7. Video Encoding | Real Producer | Legacy | Full | |
| 33.8. Web Server | Microsoft IIS 7.0Apache 2.2 | Standard | Full | |
| | Microsoft IIS 5.0, 6.0Apache 1.x | Legacy | Full | |
| 33.9. Web Browser | Microsoft Internet Explorer | Standard | Full | Support Center |
| | Chrome (with current update) | Allowed | Limited | |

34. Workstation Software

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-------------------------------|---|-------------------|---------------|---|
| 34.1. Operating System | Windows 7 SP1 Windows 10 Version 1803 | Standard | Full | Support Center / Software Standards Panel |
| 34.2. Base Software | Adobe Reader DC Windows Media Player 11 McAfee VirusScan 8 (with current update) Adobe Flash Player 12 (with current update) Microsoft DirectX 11 Internet Explorer 11 .Net framework 1.1, 2.0 SP2, 3.0 SP2, 3.5 SP1, 4.0 Java 8 (with current update) SAP GUI 7.4 Silverlight | Standard | Full | |
| | Adobe Reader X, XI Cyberlink Power DVD (OEM) Internet Explorer 9 Java 6, 7 Nero Express (OEM) | Legacy | Full | |
| 34.3. MS Office Suite | MS Office 365 ProPlus 2016 / 32-bit via Office 365 subscription (Word, Excel, | Standard | Full | |

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|------------------------------------|---|-------------------|---------------|---|
| | PowerPoint, Access, OneNote, Publisher, Skype for Business [ADA], OneDrive for Business) | | | |
| | MS Office 365 ProPlus 2016 / 64-bit via Office 365 subscription (Note that the 32-bit Office suite is the default standard) | Allowed | Full | |
| | MS Office 2007, 2013 | Legacy | Full | |
| Police | MS Office 2013 / 64-bit | Standard | Full | |
| 34.4. eMail Client | MS Outlook 2016 | Standard | Full | |
| | MS Outlook 2007, 2013 | Legacy | Full | |
| Police | MS Outlook 2013 | Standard | Full | |
| 34.5. Media Player | Windows Media Player 11 VLC Client | Allowed | Full | |
| 34.6. CD/DVD Creation | Windows built-in | Standard | Full | |
| | Roxio Creator (OEM) | Legacy | Full | |
| 34.7. Workstation Database | See Database Standards, page 26. | | | |
| 34.8. Firewall | Windows Firewall | Standard | Full | Information Security |
| 34.9. Password Safe | KeePass | Allowed | No Support | Information Security |
| 34.10. ZIP File Compression | Windows 7 built-in Zip utility 7-Zip | Allowed | No Support | Support Center / Software Standards Panel |

Security Technology Standards

35. Authentication

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-------------------------------|--|-------------------|---------------|--|
| 35.1. Windows | Kerberos | Standard | Full | Information Security |
| 35.2. Two-Factor | RSA Secure ID | Standard | Full | |
| 35.3. Single Sign On (Police) | Imprivata OneSign | Standard | Full | |
| 35.4. WiFi | Authentication Protocols EAP-TLS , PEAP Certificate provisioning: Autoenrollment via AD | Standard | Full | |
| 35.5. RADIUS | Cisco ISE | Standard | Full | Communications / Network Engineering and Support |

36. Encryption

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---------------------------------|--|-------------------|---------------|----------------------|
| 36.1. Data Storage | AES | Standard | Full | Information Security |
| | 3DES | Legacy | Full | |
| 36.2. Web Traffic | TLS 1.2 | Standard | Full | |
| | External facing certificates: Verisign Secure Site, Secure Site Pro | Standard | Full | |
| | Internal facing certificates only: Internal Certificate Authority, Verisign | Standard | Full | |
| | Secure Sockets Layer (SSL v3), TLS 1.0 | Legacy | Full | |
| 36.3. Secure FTP | SFTP (FTP over SSH) | Standard | Full | |
| 36.4. WiFi Networks (transport) | WPA2 802.11i | Standard | Full | |

37. Patch Management

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-------------------|---|-------------------|---------------|--------------------------------------|
| 37.1. Workstation | Altiris Patch Management Windows Update for Business | Standard | Full | Support Center / SET |
| 37.2. Server | Shavlik Protect | Standard | Full | Production Services / Server Support |
| | Windows Software Update Service (WSUS, Police) | Standard | Full | Police IT |

38. Remote Network Access

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|-----------------------------------|--|-------------------|---------------|----------------------|
| 38.1. VPN Appliance | Pulse SA (PSA) RadiolP (Fire, Comm) | Standard | Full | Information Security |
| | NetMotion (Police) | Standard | Full | Police IT |
| 38.2. Client VPN Software (IPSec) | NetMotion Client (Police) | Standard | Full | Police IT |

39. Storage Services and Devices

Storage Services Note:

City restricted and confidential information is strictly forbidden from unsecured storage sites. All City confidential information must be encrypted during collection, transfer, distribution, storage and disposal.

40. Virus Protection

| Item | Standard Description | Standard Category | Support Level | BTS Owner |
|---------------------|---|-------------------|---------------|---------------------|
| 40.1. Workstation | McAfee VirusScan Enterprise 8 (with current update) | Standard | Full | Support Center |
| 40.2. Server | McAfee | Standard | Full | Production Services |
| 40.3. External Mail | | | | |
| 40.4. Internal Mail | McAfee | Standard | Full | |
| 40.5. Console | McAfee ePO | Standard | Full | |

Commodity Hardware and Software

This section describes hardware and software that may be purchased directly by City staff from the City's recommended suppliers without intervention from BTS.

Some items have conditions attached in order for them to function more effectively within the City's infrastructure. While BTS is not strictly enforcing the conditions, it is highly recommended that the conditions be adhered to.

General USB Device Guidance

- Minimum USB 2.0.
- USB cables may not be provided by the vendor and need to be purchased separately.

General Bluetooth Device Guidance

- Bluetooth devices should use native Windows device drivers.

Computer Speakers

Digital Cameras

- Minimal technical support is provided by BTS.
- USB interface required. See General USB Device Guidance above.
- Support from BTS is not part of the SLA and will be billable.
- Any bundled software must be Windows 7 and 10 compatible. There is no support from BTS for bundled software.
- Be careful about what bundled software is loaded by default. Load only what is needed.

Fax Machines

Flash / Compact Media cards

Headphones

Keyboards

- USB Interface required. See General USB Device Guidance above.

Laser Printer Toner Cartridges

Locally connected USB Printers

- **BTS encourages the use of standard network attached printers rather than locally attached InkJet or Laser printers.**
- BTS has evaluated two different USB connected HP OfficeJet printers for different business needs. The OfficeJet 7000 series offers color, large format

(11x17) capability. The OfficeJet Pro 8100 series offers color, standard format capability (letter, legal), is expandable for scanning, copying and faxing, and is supported by the City's standard Universal Print Driver from HP.

- USB interface required. See General USB Device Guidance above.
- Support from BTS is not part of the SLA and will be billable. **Note: Installations on Windows 7 or 10 requiring BTS assistance and will be billable.**
- For locally attached use to a single computer only. BTS will not network these devices.

Mouses / Track-balls

- This includes Optical, multi-button with scroll wheels, track balls.
- USB interface required. See General USB Device Guidance above.

Removable Media (USB Storage devices, CDs, DVDs)

- USB Storage Devices should be used for temporary storage or file transfer and not for long term offline file storage.
- Removable media are not appropriate for storing record copies of City records.
- Bureaus are responsible to follow established Administrative Rules regarding the use of removable media.
 - [ADM-8.12 - Management, Preservation and Storage of Electronic Records and Electronic Mail Correspondence \(E-Mail\)](#).
- This category is for devices used with non-sensitive data. Encryption strategies for sensitive data requirements must be discussed with BTS Information Security and adhere to Administrative Rule [BTS-2.15 - Encryption](#).
- Devices chosen should operate with standard built-in operating system (Windows) drivers and not require customized drivers.
- USB interface required. See General USB Device Guidance above.
- Be aware of potential compatibility problems between CD and DVD media formats.

Technology Specifications

This section documents the minimum specification used to select the approved standards. Not all standards have associated specifications. This is because some listed standards are documentation of best practice.

Workstation Standard Criteria

The base component criteria for standard desktop and laptop workstations is as follows.

Preferred Desktop

- Intel® processor, 64-bit (i5).
- 8 GB RAM memory (Dual DIMM).
- Small to moderately sized hard drive used primarily for Operating System and application programs and associated configuration files. (500 GB)
- DVD +/- RW Optical single layer drive.
- On-board video card, dual monitor capable.
- 104 key keyboard.
- Optical wheel mouse.
- Minimum 100 Mb/s network interface card.
- Mid tower case.
- Energy Star 6.0 and EPEAT Gold compliant.
- Intel Standard Management with Active Management Technology (AMT)
- 3 year warranty.

Laptop criteria match desktop workstation criteria as close as possible with the following additions.

- Preferred
 - 256MB Solid State Drive (SSD)
 - On-board Intel HD Graphics 4400 video.
 - 14" LED HD display.
 - WiFi 802.11 ac/a/b/g/n 2x2 Wireless LAN + Bluetooth 4.0, supporting EAP-TLS and WAP2.
 - Docking bay.
 - Built-in camera and microphone.
 - Fingerprint reader.
 - Backlit Keyboard
- Ruggedized
 - weather proof, shock resistant.
- Ultra-lite
 - Intel® processor, 64-bit
 - 8 GB RAM
 - 256 GB Solid State hard drive.
 - WiFi 802.11 b/g/n supporting EAP-TLS and WAP2.

- WiMax support (optional).
- Bluetooth support (optional).
- Docking bay.

Mobile Data Computers (MDC)

The MDC is a PC that has been physically adapted to a mobile, public safety environment. The recommended minimum hardware specifications are:

| | |
|-----------------------------|---|
| Representative Mfg. / Model | Any Intel Pentium-based Windows workstation such as: Panasonic, Data911, L3, etc. |
| Display | Minimum resolution: 800x600 with 1024x768 preferred |
| Processor Type / Speed | Intel Pentium / 1 .6 GHz Intel Pentium 2.6 GHz |
| Main Memory | 1 GB recommended 8 GB recommended |
| Disk Storage | 80 GB. Mapping may require more disk space, depending upon the layers. |
| Operating System Software | Windows 7 Enterprise SP1. |

The Versadex MDC application is adapted for touchscreen use, so a touch-sensitive display was suggested, but not required.

It is commonly seen in two primary forms

- A ruggedized notebook
- A component-based, permanently mounted PC.

Network connectivity is achieved through carrier supplied 3G/4G cellular data networks.

Network Printer Standard Criteria

| Attribute | Small / Medium Workgroup | Larger Workgroup | Large Format |
|-------------------------------------|---|--|--|
| Pages per minute | 25 – 30 | 25 – 50 | 25 - 50 |
| Minimum duty cycle per Month | 3,000 | 15,000 | 10,000 |
| Network Interface | Internal, 10/100 Mb/s, IPv4 | | |
| Page Size | Letter 8.5 x 11 Legal 8.5 x 14 No 10 Envelope | Letter 8.5 x 11 Legal 8.5 x 14 No. 10 Envelope | Letter 8.5 x 11 Legal 8.5 x 14 Tabloid 11x 17 No. 10 Envelope |
| Page definition language | PCL 5 Postscript | | |
| Memory | 32 MB | 96 MB | 128 MB |
| Display | LCD Panel for on-site configuration | | |
| Driver | Microsoft certified for installation on Windows 2008 Server by listing at http://www.windowsservercatalog.com/ready.aspx . Supported device for HP Universal Print Driver. | | |
| Duplexing | Yes | | |
| Trays | 1 trays plus multipurpose tray. | 2 trays plus multipurpose tray. | 2 trays plus multipurpose tray. |
| Envelope Feeder | Optional | Optional | |
| Compatible with 100% Recycled paper | Yes | | |
| Color | Option for Black and White or Color models | | |
| Energy Star | Yes | | |

Network Printer Specifications (B/W)

| Feature | M402dne | M506dn | M604 | M605 | M712dn High Volume Large Format |
|---|-------------|-------------|--------------|--------------|---------------------------------------|
| Print Speed-Black (ppm: pages / minute) | 40 | 45 | 52 | 58 | 40 |
| Print Resolution (dpi: dots per inch) | 1200 x 1200 | 1200 x 1200 | 1200 x 1200 | 1200 x 1200 | 1,200 x 1,200 |
| Monthly duty cycle (pages) | 80,000 | 150,000 | 175,000 | 225,000 | 200,000 |
| Recommended monthly duty cycle | 750-4,000 | 2,000-7,500 | 5,000-13,000 | 5,000-16,000 | 15,000-50,000 |
| Memory: Standard | 256 MB | 512 MB | 512 MB | 512 MB | 128 MB |
| Memory: Max | 256 MB | 1.5 GB | 1.5 GB | 1.5 GB | 512 MB |
| Paper Trays: Std | 2 | 2 | 2 | 2 | 3 |
| Paper Trays: Max | 2 | 5 | 6 | 6 | 4 |
| Duplex Printing | Auto/Std | Auto/Std | Auto/Std | Auto/Std | Auto/Opt |
| 11 x 17 (Large Format) | No | No | No | No | Yes |
| Energy Star | Yes | Yes | Yes | Yes | Yes |
| HP ePrint | Yes | Yes | Yes | Yes | |

Network Printer Specifications (B/W Multi-Function)

| Feature | M225dn | M426fdn | M725dn Large Format |
|---|--------------------------------|--------------------------------|----------------------------|
| Print Speed-Black (ppm: pages / minute) | 26 | 40 | 40 |
| Print Resolution (dpi: dots per inch) | 1200 x 1200 | 600 x 600 | 1200 x 1200 |
| Monthly duty cycle (pages) | 15,000 | 80,000 | 200,000 |
| Recommended monthly duty cycle | 500 -2,000 | 750-4,000 | 5,000-20,000 |
| Memory: Standard | 256 MB | 256 MB | 1 GB |
| Memory: Max | 256 MB | 256 MB | 1 GB |
| Paper Trays: Std | 2 | 2 | 3 |
| Paper Trays: Max | 2 | 3 | 4 |
| Duplex Printing | Auto/Std | Auto/Std | Auto/Std |
| 11 x 17 (Large Format) | No | No | Yes |
| Energy Star/EPEAT | Yes/Silver | Yes/Silver | Yes |
| HP ePrint | Yes | Yes | Yes |
| Scanner Type | Flatbed with Auto Doc Feed | Flatbed with Auto Doc Feed | Flatbed with Auto Doc Feed |
| Max Scan Resolution (dpi) | 1,200 | 1,200 | 600 |
| Scan Speed (ppm) | 6 color 15 B/W | 21 color 26 B/W | 30 color 43 B/W |
| Scan size | 8.5x11 flat 8.5x14 doc feed | 8.5x11 flat 8.5x14 doc feed | 11 x 17 |
| Copy Resolution | 600 x 600 | 600 x 600 | 600 x 600 |
| Copy reduce/enlarge | 25-400% | 25-400% | 25-400% |
| Fax Resolution | 300 x 300 | 300 x 300 | 600 x 600 |

Network Printer Specifications (Color)

| Feature | M452 | CP5225 Large Format | M553 | M651 | M750 Large Format | M855 Large Format |
|--|-----------|------------------------|------------------|--------------|----------------------|----------------------|
| Print Speed-Black / color (ppm:pages / minute, normal quality) | 28 / 27 | 20 / 20 | 40 / 40 | 42 / 42 | 30 / 30 | 45 / 45 |
| Resolution (dots per inch) | 600 x 600 | 1200 x 1200 | HP ImageREt 3600 | 1200 x 1200 | 600 x 600 | 1200 x 1200 |
| Monthly duty cycle (pages) | 50,000 | 75,000 | 80,000 | 120,000 | 120,000 | 175,000 |
| Recommended monthly duty cycle | 750-4,000 | 1,500-5,000 | 6,000 | 2,000-17,000 | 2,500-10,000 | 4,000-17,000 |
| Memory: Standard | 128 MB | 192 MB | 1 GB | 1.5 GB | 1 GB | 1 GB |
| Memory: Max | 128 MB | 448 MB | 2 GB | 1.5GB | 1 GB | 1 GB |
| Paper Trays: Std | 2 | 2 | 2 | 2 | 3 | 5 |
| Paper Trays: Max | 3 | 3 | 5 | 5 | 6 | 5 |
| Duplex Printing | Auto/Std | Auto/Std | Auto/Std | Auto/Std | Auto/Std | Auto/Std |
| 11 x 17 (Large Format) | No | Yes | No | No | Yes | Yes |
| Energy Star / EPEAT | Yes | Yes | Yes/Silver | Yes | Yes | Yes |

Network Printer Specifications (Color, Multi-Function)

| Feature | M477fdn |
|--|---|
| Print Speed-Black / color (ppm:pages / minute, normal quality) | 28 / 28 |
| Resolution (dots per inch) | 600 x 600 |
| Monthly duty cycle (pages) | 50,000 |
| Recommended monthly duty cycle | 750-4,000 |
| Memory: Standard | 256 MB |
| Memory: Max | 256 MB |
| Paper Trays: Std | 2 |
| Paper Trays: Max | 3 |
| Duplex Printing | Auto/Std |
| 11 x 17 (Large Format) | No |
| Energy Star / EPEAT | Yes |
| Scanner Type | Flatbed with Auto Doc Feed (ADF) |
| Max Scan Resolution (dpi) | 1200 x 1200 |
| Scan Speed (ppm) | B/W: 26 ppm / 47 ipm Color: 21 pm / 30 ipm |
| Scan size | Flatbed: 8.5x11 ADF: 8.5x14 |
| Copy Resolution | 600 x 600 |
| Copy reduce/enlarge | 25-400% |
| Fax Resolution | 300 x 300 |

Scanner Standard Criteria

Scanner criteria are based on the needs of image scanning as specified by the SAP implementation project.

| Type | Native Resolution | Speed (BW) | Max scan size | Connectivity | Type | Doc Feed |
|---------------|-------------------|--------------------|---------------|--------------|----------------------|---------------|
| Low Volume | 300 x 300 dpi | 10 ppm | 8 ½ x 14 | USB 2.0 | Flatbed or Sheet fed | Std 50 sheet. |
| Medium Volume | 300 x 300 dpi | 20 ppm, 40 ipm dup | 8 ½ x 14 | USB 2.0 | Flatbed or Sheet fed | Std 50 sheet. |

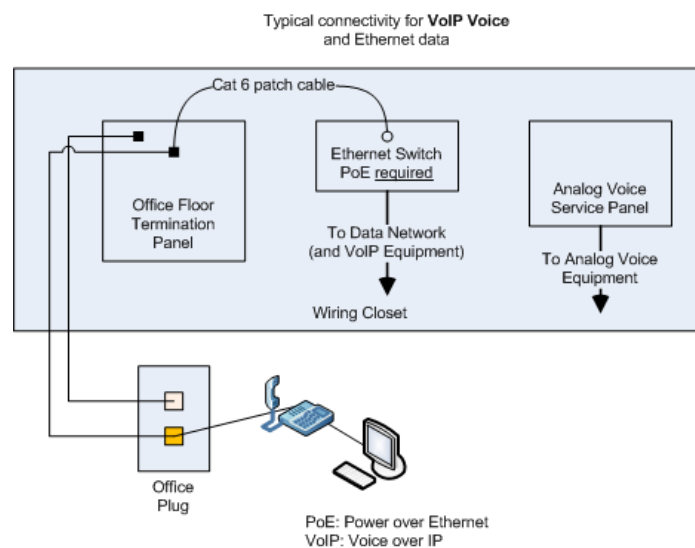
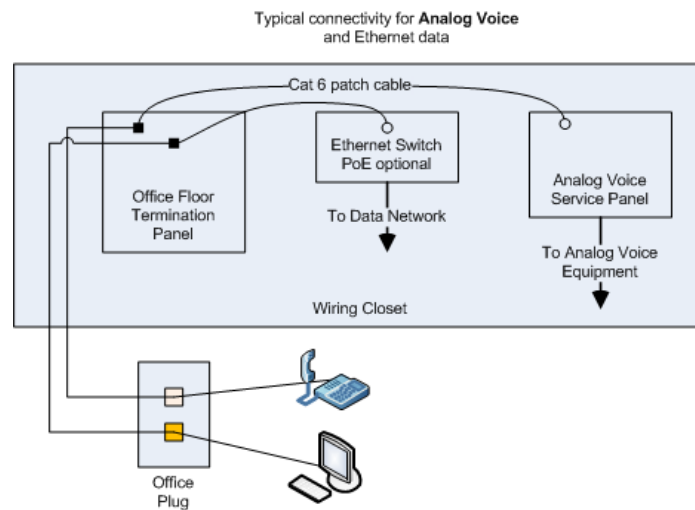
Cabling Specification

New Construction

In new construction scenarios, BTS has determined that installing two (2) Category 6 cables are generally sufficient to connect typical computer and telephone equipment found in an office or cubicle. Wiring closet configuration will generally conform to the following block diagram.

Remodel

In remodel scenarios, BTS will evaluate the existing cabling and wiring closets in order to determine and recommend the most cost effective method of cabling the remodeled space that meets the customer business need while preserving maintainability of the underlying infrastructure in the wiring closet. This may not always result in a reduced cable count to the office or cubicle.



Video Projector Criteria

| Attribute | Ultra Portable | Portable | Ceiling Mounted |
|----------------|----------------------------------|--------------------------|---|
| Resolution | 1024 x 768 (XGA/HDMI) | 1024 x 768 (XGA/HDMI) | 1024 x 768 (XGA/HDMI) |
| Brightness | Minimum 2500 Lumens | Minimum 2500 Lumens | Minimum 100 Lumens / sq ft of Screen |
| Remote Control | Optional | Optional | Yes |
| Zoom Lens | Yes | Yes | Yes |
| Focus | Manual | Manual | Powered via Remote Control |
| Video Input | VGA | VGA | VGA |
| Color | 16.7 million | 16.7 million | 16.7 million |
| Weight | ≤ 4 lbs ("light as possible") | | |

Considerations for Ceiling Mounted Projectors

When mounting a projector to the ceiling, the projector, screen size and ambient room light must be considered together. The Brightness for a Ceiling Mounted projector is expressed as a minimum lumens per square foot of screen area, where lumens is the rated lumen output of the projector. The higher the value, the easier the image will be to see. On a reflective screen, 100 lumens / sq ft will yield an image that is visible in standard windowless conference room lighting. Uncovered windows or projecting on other surfaces such as a wall may require a higher value of lumens per square foot. A value of 125 lumens / sq ft should be considered.

Care must also be taken with the placement of the screen in relationship to ceiling lights and windows. A ceiling light directly over the screen will wash out the image regardless of its brightness. Electrical modifications may be necessary in order to turn "problematic" lights off when projecting. Similarly, window light can also wash out the screen image and blinds may be necessary to achieve acceptable viewing.

Update Log

Changes to the document since adoption.

| Date | Item | Standard Description | Category / Support Level |
|----------|--|---|--|
| 9/12/17 | 15.8 USB Wireless Cellular Data Modem | 730L 620L | Standard / Full Legacy / Full |
| 10/10/17 | 14.6 Smartphone Operating System | 11.0.3 10.x, 11.0.2 | Standard / Limited Legacy / Limited |
| | 26.5 Computer Aided Design | Sketchup Pro Sketchup Make | Allowed / Not Supported |
| 10/24/17 | 14.5 Smartphone | iPhone 8, 8 Plus iPhone 5, 5c | Standard / Limited Legacy / Limited |
| 11/1/17 | 40.3 External Mail Virus Protection | Kaspersky | Removed |
| | 28.4 Kiosk Miscellaneous Tools | Microsoft Steady State | Removed |
| | 14.5 Smartphone | iPhone 7, 7 Plus | Legacy / Limited |
| 11/21/17 | 10.1 Laser Printers | M607dn, M608dn, M653dn M604dn, M605dn, M651dn | Standard / Full Legacy / Full |
| | 14.6 Smartphone Operating System | 11.1.2 11.0 | Standard / Limited Legacy / Limited |
| | 26.3 Graphic Design | Microsoft Movie Maker | Removed |
| 2/6/18 | 33.6 Scripting Languages | Python 3.x | Standard / Full |
| | 14.6 Smartphone Operating System | 11.2.2 11.1 | Standard / Limited Legacy / Limited |
| | 26.2 PDF Creation | PDFCreator 3.1 | Allowed / Limited |
| | 34.1 Workstation Software Operating System | Windows 10 Version 1703 Windows 10 Versions 1511, 1603, 1607 | Standard / Full Removed |
| 3/6/18 | 16.2 Projector, Portable | Infocus 116xa Infocus 116x | Standard / Full Legacy / Full |
| 4/3/18 | 26.2 PDF Creation | PDFCreator | Legacy / Limited |
| | 10.1 Laser Printer | HP 608x HP 605x | Standard / Full Legacy / Full |
| | 28.9 Terminal Emulation (3270) | Micro Focus Reflection Desktop 2016 | Allowed / Limited |

| Date | Item | Standard Description | Category / Support Level |
|---------|---|---|--|
| | | Attachmate Extra Xtreme | Legacy / Not Supported |
| | 13.8 File Sharing | HCP Anywhere | Standard / Full |
| 5/15/18 | 14.6 Smartphone Operating System | 11.3.1 11.2 | Standard / Limited Legacy / Limited |
| | 3.1 Tablet Hardware | iPad 6 | Standard / Limited |
| 5/29/18 | 26.1 Visual Diagramming | Visio 2016 Click-to-Run Perpetual License | Standard / Full |
| | 30.1 Project Management Software | Project 2016 Click-to-Run Perpetual License | Standard / Full |
| | 31.1 Server Operating System | Windows Server 2016 64-bit | Standard / Full |
| | 14.11 Cellular Micro Cell | Verizon Network Extender Appliance | Standard / Full |
| 6/14/18 | 18.4 Reporting Tool – All Tableau product purchases on hold pending product review. | | |
| 6/26/18 | 14.6 Smartphone Operating System | 11.4 11.3 | Standard / Limited Legacy / Limited |
| 7/19/18 | 18.4 Reporting Tools | Hold lifted. | |
| | | Tableau Creator Tableau Explorer Tableau Viewer Tableau Prep | Allowed / Limited |
| | | Tableau Public | Exception Required |
| 8/7/18 | 28.12 Text to Speech | JAWS NVDA TextHelp | Allowed / Limited |
| | 28.13 Screen Magnifier | ZoomText MAGic | Allowed / Limited |
| | 28.14 Video Remote Interpreting | LanguageLine | Allowed / No Support |
| | 28.15 Video Relay Chat | Convo ZVRS | Allowed / Limited |
| | 1.5 Braille Display / Terminal | Freedom Scientific (Focus Blue) HumanWare (Brailiant) | Allowed / Limited |
| 9/4/18 | 34.1 Workstation Operating System | Windows 10 version 1803 | Standard / Full |
| | | Windows 10 version 1703 | Removed |

| Date | Item | Standard Description | Category / Support Level |
|-------------|----------------------------------|--|--|
| | 1.2 Monitor | Dell U2415 Dell U2412M | Standard / Full Legacy / Full |
| | 34.3 MS Office Suite | MS Office 365 ProPlus 2016 64-bit | Allowed / Full |
| 10/2/18 | 2.1 Laptop | Dell 5490 Dell 5480 Dell 7490 Dell 7480 | Standard / Full Legacy / Full Standard / Full Legacy / Full |
| | 2.2 Laptop – “Lite” | Dell 7390 Dell 7280 | Standard / Full Legacy / Full |
| 10/16/2018 | 14.6 Smartphone Operating System | 12.0.1 11 (all versions) | Standard / Limited Legacy / Limited |

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