CAPITAL IMPROVEMENT PROGRAM
City of Missoula CIP Project Request Form FY 2017-2021

Program Category:	Project Title:		16 Project #	16 Project #	17 Project #
	Voip/Data/GIS/Storage Upgrades				CS-10

Description and justification of project and funding sources:

This project will upgrade our voice and data infrastructure to create a robust desktop experience for staff and enhance the security, reliability and efficiency of our datacenter. Bringing in modern equipment, services & functionality will improve staff efficiency, lower operation costs, and improve security and reliability. The result will be a highly effective and collaborative business environment that improves the way the City of Missoula interacts with its citizens, employees, partners and customers . This includes a total replacement of our outdated phone system with a new enhanced audio, video, voice, and instant messaging platform. The vision for the future is to respond quickly to changing department demands for technology by transforming our data center into a responsive and resilient asset using a unified computing platform with a simplified management system. With this project we will also do a city wide consolidation of our GIS and Asset management systems.

	Yes	No	NA
Is this equipment prioritized on an equipment replacement schedule?	x		
Is there ongoing Operating and/or Maintenance costs upon completon of project?	X		

Are there any site requirements:

N/A

How is this project going to be funded:

Funding Source	Accounting Code	FY17	FY18	FY19	FY20	FY21	Funded in Prior Years
General Fund equipment lease		141,475	31,500	3,700	(4,900)	-	168,710
		141,475	31,500	3,700	(4,900)	-	**168,710**

How is this project going to be spent:

Budgeted Funds	Accounting Code	FY17	FY18	FY19	FY20	FY21	Spent in Prior Years
A. Land Cost							
B. Construction Cost							
C. Contingencies (10% of B)							
D. Design & Engineering (15% of B)							
E. Percent for Art (1% of B)							
F. Equipment Costs		82,745	31,500	3,700	(4,900)		**147,670**
G. Other		58,730	-				**21,040**
		141,475	31,500	3,700	(4,900)	-	168,710

Does this project have any ongoing Operating and/or Maintenance cost to be included in the operating budget:

(account for operational savings and/or reduction in current budget of previous operating/maintenance charges)

Expense Object	Accounting Code	FY17	FY18	FY19	FY20	FY21	Spent in Prior Years
Personnel							
Supplies							
Purchased Services		22,300	23,160	25,260	25,260		**13,350**
Fixed Charges							
Capital Outlay							
Debt Service							
(Operational Savings)							**-**
		22,300	23,160	25,260	25,260	-	**13,350**

In 2006 the city moved to a voip phone system. ~~This system was paid for and now realizes a $100,000 savings on the voice platform and the requested enhancements will help preserve this asset.~~ The current system was paid for and continues to realize a $100,000 saving on the voice platform. The requested enhancements will help preserve this asset into the future. (These are long distance charges tht we no longer pay)

Responsible Person:	Responsible Department:	Date Submitted to Finance	Today's Date and Time	Preparer's Initials	Total Score
Carl Horton	**Information Technologies**	**3/27/2015**	2/26/2015 0:00	CH	56

CAPITAL IMPROVEMENT PROGRAM
Project Rating
(See C.I.P. Instructions For Explanation of Criteria)

Program Category:	Project Title:				10 Project #
0	**Voip/Data/GIS/Storage Upgrades**				**CS-10**

Qualitative Analysis	Yes	No	Comments
1. Is the project necessary to meet federal, state, or local legal requirements? This criterion includes projects mandated by Court Order to meet requirements of law or other requirements. Of special concern is that the project be accessible to the handicapped.		x	
2. Is the project necessary to fulfill a contractual requirement? This criterion includes Federal or State grants which require local participation. Indicate the Grant name and number in the comment column.		x	
3. Is this project urgently required? Will delay result in curtailment of an essential service? This statement should be checked "Yes" only if an emergency is clearly indicated; otherwise, answer "No". If "Yes", be sure to give full justification.		x	
4. Does the project provide for and/or improve public health and/or public safety? This criterion should be answered "No" unless public health and/or safety can be shown to be an urgent or critical factor.		x	

Quantitative Analysis	Raw Score Range	Comments	Weight	Total Score
5. Does the project result in maximum benefit to the community from the investment dollar?	(0-3) 3	There is a $100,000 direct asset preservation realized on the voip system.	5	15
6. Does the project require speedy implementation in order to assure its maximum effectiveness?	(0-3) 3	Current phone system and core hardware is out of warranty and end of life. We will have parts of the system in place for over 15 years by the time it is all replaced.	4	12
7. Does the project conserve energy, cultural or natural resources, or reduce pollution?	(0-3) 3	Using new collapsible core technology & new modern phones we will realize less hardware in the datacenter and on the user desktop. A unified computing platform will improve on power savings.	3	9
8. Does the project improve or expand upon essential City services where such services are recognized and accepted as being necessary and effective?	(0-2) 2	This will improve employee/user efficiency through the use of new collaboration tools including video conferencing, desktop and application sharing, presence and IM. This will increase user collaboration through video desktop sharing. Network and datacenter security will be greatly enhanced by upgrading to the latest standards and technology available. We will improve security of our entire backbone using the latest technologies. Further consolidation of our datacenter through the use of a unified computing platform will improve on power savings and provide greater computing density in our server room.	4	8
9. Does the project specifically relate to the City's strategic planning priorities or other plans?	(0-3) 3	This is achieved through recurring cost reduction, integrated voice/video and data services aiding communication between employees.	4	12
		Total Score		56

17 Project #	Project Title:
CS-10	**Voip/Data/GIS/Storage Upgrades**

Date	Author	Notes
3/26/2015	Carl Horton	All product notes, specifications and model numbers have been removed for security purposes.

Date	Author	Notes

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Voice + Data Infrastructure Upgrade

		2016	2017	2018	2019	2020
Capital Improvement Program:						
Phone System Replacement						
2	Audio Codes		$ 13,700			
450	Phones and Headsets		$ 25,100	$ 25,100	$ 25,100	$ 25,100
	Phone Professional Services		$ 27,170			
	Phone Rollout for users		$ 12,100			
	Project Management		$ 4,600			
	User Training		$ 7,300			
Network and Core upgrade						
2	Core switches	$ 63,440				
	Configuration	$ 2,520				
2	License	$ 2,720				
Blade Servers						
4	UCS Server Core (6 of 12 blades)		$ 54,045			
4	Add On Servers - optional			$ 36,400		
	UCS Rollout		$ 4,320			
	Reduction in annual server replacement		$ (30,000)	$ (40,000)	$ (40,000)	$ (40,000)
Routers						
1	Router		$ 9,900			
	Router Config		$ 1,620			
	Router Rollout		$ 1,620			
Switches						
	New Switch Compents for existing	$ 10,230				
Firewall						
2	Firewalls Hardware-City	$ 29,000				
2	Firewall Config/Stage/Install-City	$ 9,500				
	Firewall Smartnet-City	$ 6,300				
Geographic Information Systems						
1	Consolidate GIS/AMS	$ 45,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000
Wireless Access						
20	Access Points				$ 8,600	
	TOTAL EXPENDITURES:	**$ 168,710**	**$ 141,475**	**$ 31,500**	**$ 3,700**	**$ (4,900)**

		2016	2017	2018	2019	2020
Operating Budget Impact:						
	Smartnet = Hardware replacement insurance					
	Network and Core upgrade					
2	Smart net (annual cost 3k)		$ 3,000	$ 3,000	$ 3,000	$ 3,000
	Blade Servers					
	UCS smart net- 1 year		$ 5,700	$ 5,700	$ 5,700	$ 5,700
	Routers					
	Router smart net-(annual cost $860)			$ 860	$ 860	$ 860
	Switches					
	Smart net 1year		$ 250	$ 250	$ 250	$ 250
	Firewall					
2	Firewall Smartnet-City				$ 2,100	$ 2,100
	Network and Core upgrade					
	1 year support for phone only	$ 10,150	$ 10,150	$ 10,150	$ 10,150	$ 10,150
	Dell microsoft lync license	$ 3,200	$ 3,200	$ 3,200	$ 3,200	$ 3,200
		$ 13,350	**$ 22,300**	**$ 23,160**	**$ 25,260**	**$ 25,260**

Executive Summary

Provide for a Plan, Design, and Upgrade the Enterprise IP Telephony Project for the City of Missoula. The new IP Te
Our phone vendor will provide a complete turnkey solution implementation that is reliable, scalable, and flexible.

Planning and Design
o   This is critical to overall success of the project
o   The Vendor will work closely with City of Missoula during this process to create an implementation plan that is
o   During the design and discovery phase new requirements could be uncovered that were not envisioned in the

Programming, Advance configuration and testing in the Vendor facility
o   The Vendor will pre provision the routers and switches.
o   The vendor will do basic testing and database verification prior to delivery to City of Missoula.

Project Management
o   City of Missoula will have a dedicated project manager to coordinate weekly meetings, track action items, serv

Installation of Routers and Switches
o   The Vendor will install and test new routers and switches per the installation plan
o   Equipment will run in parallel with existing where possible. City of Missoula will migrate their data to the new ba

Installation of LYNC and Voicemail
o   The Vendor will install the Audio Codes and redirect current phone platform onto new phone systems
o   The Vendor will program the new system
o   Customer will be responsible for testing existing features.

All programming, advance configuration, and testing in the vendor facility
o   The vendor will pre provision the routers and switches
o   The Vendor will do basic testing and database verification prior to delivery to City of Missoula

Train the Trainer
o   The vendor will provide train the trainer pricing to reduce costs.
o   The vendor will train selected City of Missoula person on how to do basic admin.

Place and testing of Phones
o   The vendor will install and test the phones per established test plans
Cutover
o   The vendor will work with City of Missoula during the cutover to ensure integration is working properly.
o   City of Missoula and the vendor will supply onsite support to staff Help desk for the first user day after cutover
o   The vendor to supply 4 hours of move add and change work as part of the installation.

Equipment Staging (Performed at vendor headquarters)

o   Receive and inventory product
o   Assemble devices per the network implementation plan
o   Test products per the network implementation plan

Installation of components including:

o   User and device registration
o   Coordinate change control requests
o   Routing and Switching infrastructure
o   The Vendor will program all software with patches
o   The Vendor will program new IP Phones
o   The Vendor will patch, place and test phones

o   The vendor will program Digital and/or Analog gateways
o   Firmware and IOS upgrades on all applicable devices
o   User and device registration
o   Lines, extensions, and IP Phone configuration
o   Creation of partitions, Calling Search Spaces, and user classes (If required)
o   Route patterns including Emergency 911 (E911)
o   User directory, auto attendant, dial by name capabilities
o   Interface and dial-peers configuration on Cisco IOS devices
o   Build Voicemail Boxes

Post-Implementation Testing

o   Testing of user classes
o   Internal calls
o   Local Area Code dialing
o   1+ and International dialing
o   Voice mail notification
o   Call quality including latency, jitter, and echo
o   Call forwarding, call park, busy rollover, etc
o   Speed dialing, ad-hoc and meet-me conferencing
o   Document post-implementation testing results

Administrator Training

o   Adds, moves, changes
o   Configuring route patterns
o   Troubleshooting and call tracing
o   Train the trainer on use of Unified Messaging and IP Phones

Project Documentation

o   Build documentation of the IP Telephony implementation
o   Network design diagrams to
o   Configuration captures
o   List of registered users and devices
o   Extensions list
o   Troubleshooting resources
o   Route Plan Report

Vendor tasks involve:
o   Installation and testing of all switches and routers (The vendor will pre-configure prior to delivery)
o   Installing and testing all IP Phones
§   Recommend these phones be set out no more that 1-2 weeks prior to the in service date. Typically an install (
o   Train end users on
§   It is critical for the end users to have some form of hands on training prior to cutover. Preferably less than a w

Planning

o   Review call load/capacity
o   Interview key personnel to gather requirements regarding:
o   Client numbering plan, call patterns, and call routing requirements
o   Determining existing extensions, DID's, and analog circuits
o   Telephony supplemental services requirements (i.e. call forward, call transfer, conferencing, auto attendant, et
o   Define acceptable implementation schedule, minimizing impact on internal staff and business operations
o   Define availability and redundancy requirements

Design

The vendor team will leverage the information gained in the Assessment and Planning phase to define the detailed r
o   Define availability and redundancy requirements
o   Define the detailed logical and physical LAN and WAN Infrastructure
o   Define the specific requirements of the physical network including circuits, hardware and software.
o   IP Telephony integration with existing and/or new network environment
o   Quality of Service (QoS)
o   Develop hardware/software configuration templates for switches, gateways, dial plans, and call processing
o   Server and gateway location
o   Develop IP Address Architecture plan for voice VLAN capabilities
o   DHCP and TFTP configuration
o   Redundancy and fault tolerance, and Backup procedures
o   Numbering plan and route patterns
o   Telephony supplemental services
o   Analog circuits
o   911 and other Public Safety networks will remain online during the entire process.

Training of end users
o   The vendor will conduct all end user training
o   Standardized implementations
o   Tier 3 technical design review
o   Installation Planning
o   Lan/Wan review
o   Engineer's assist with all phases of the installation
o   Engineers assist vendor local resources with installation and support issues.
o   The team performs all installation activities per agreed scope of work.
o   Engineers work closely with local resources for ongoing service and support.

City of Missoula Task List:
The vendor is responsible for:
Network Infrastructure: Complete infrastructure upgrade that will be transparent to the end user through coordinated

Call Manager Cluster: Install, configure, and test Software. Cluster configuration, integrate with Exchange Voicemai

Voice Infrastructure: The vendor will stage, test, and implement Servers and the new Messaging System at their h

City of Missoula Remote Site(s):

City of Missoula Responsible for: Building access, cutover assistance and training as needed
The vendor Responsible for:
Routers: Configure/test
Switches: Configure/test
Firewalls: Configure/test
Server Core: Configure/test

Network design diagrams: will be provided to illustrate the logical layout of the infrastructure, including some high-lev

Completion Criteria

This engagement will be deemed completed when the following items have been accomplished:
All deliverables specified in this SOW have been submitted.

Change Order Process

City of Missoula, and the vendor need to agree, that this SOW may be amended by a Change Order Form, prepared

·   The invalidation of any of the Assumptions.
·   Failure of City of Missoula to meet their Client Responsibilities.
·   Delays caused by factors outside of the vendors control.
·   The occurrence of any other event or the discovery of any other information that affects the vendors ability to p
·   Any other mutually agreeable reason.

The remedy to any of the above may include changes to: the composition of the engagement team, duration, deliver
Whenever there is a conflict between the terms of a fully executed Change Order Form and those in this SOW, or a

The assumptions below were used by the vendor to scope this engagement based on information provided to it by C
Working hours for this engagement will be normal business hours (Monday to Friday, 8AM to 5PM excluding holiday
test or be responsible for interoperability between or to systems not identified in this SOW. All items listed in the Clie

o   Network Management of the IP Telephony and LAN Infrastructure components
o   Ongoing Support and Maintenance of the IP Telephony and LAN Infrastructure components after implementat
o   Troubleshooting of service provider and product manufacturer issues beyond the vendor control.

City of Missoula agrees to provide timely access to all personnel, resources (including all necessary hardware, softw

Vendor Coordination

·   City of Missoula is responsible for coordinating other vendors who need to work with the vendor on
the implementation
        us when we integrate the Call Manager into the Norte, and existing voicemail into Call Manager

City of Missoula specifically agrees to:

·   Assign a SPOC to represent City of Missoula. The SPOC will have decision-making authority for most matters
·   Ensure that their SPOC be available to meet with the vendor a minimum of once a week for the Status meetin
·   Provide proper documentation for existing network.
·   Ensure that City of Missoula or third-party provided materials would be available on or before the date required
·   The City of Missoula SPOC will be responsible to facilitate the scheduling of interviews and information gather
·   Provide appropriate personnel to assist in identifying users of systems and contact information.
·   Provide timely access to staff and personnel to answer questions regarding business or network information.
·   Make City of Missoula personnel (network, application and users) available for testing at appropriate points in
·   The City of Missoula SPOC will be responsible to identify and coordinate with the appropriate individuals
within City of Missoula to review draft deliverables. These reviews must be within the agreed upon timeframe in
·   Inform the vendor of any developments in other projects that might impact this engagement.
·   Provide the vendor with all relevant documentation and information as it pertains to the business requirements
·   Provide all necessary network access (logins, passwords, etc.) to vendor at the start of the engagement.
·   Provide the vendor resources with the necessary physical and/or system access required to complete the deli
·   Provide all information and materials identified throughout this SOW on time. To the best of City of Missoula'
·   Provide all integration checklists and acceptance criteria as per the engagement schedule.

If City of Missoula fails to perform any of the responsibilities set forth herein, the parties agree to resolve the situatio

Communications Plan

Kickoff Meeting
·   This SOW will be reviewed and any questions or issues will either be resolved at the meeting or will be docum
·   All key stakeholders within City of Missoula will be identified and their email and phone numbers provided for f

Status Meetings

·   The initial expectation is that they will be held weekly although the timing may be adjusted based on the needs
·   At a minimum the City of Missoula and the vendors SPOCs will be in attendance. Additional parties will be
invited based on the needs of the engagement.
·   The vendor will provide an update as to the overall status of the engagement and plans for the coming week th

- ·   Discussion and resolution of any non-critical issues that are occurring.
- ·   Review of any issues that have been escalated.
- ·   Notification to the other party of any planned absences of key personnel.
- ·   Review of the Project Plan.

Project Notebook

A Project Notebook will be maintained throughout this engagement and will be available for review by named individu

Ad Hoc Communications

The City of Missoula and the vendor SPOCs will define the situations where the vendor personnel will be able to con

Initiation of Work

In order for the vendor to begin work, we will require receipt of the signed SOW and any other documents (e.g., purc

Expected Duration

Based on the information provided to the vendor by City of Missoula and on our professional experience, we estimat

elephony infrastructure will support approximately 500 Phone in 15 Locations

least impacting to City of Missoula end users.
current Scope of Work, and may require a Change Order Process.

re as single point of contact (SPOC) for customer, the primary vendor, and 3rd party vendors.

ackbone prior to any IP phones.

of this size requires a team of 5-6 people over a few days to place and test.

eek ahead of the in service date.

tc.)

network design. The tasks that will be performed in this project phase will include the design of the following. A lot of

efforts from the City of Missoula, and the vendor Enterprise Solutions. Routers/Gateways, Switches (Core/Distribu

l system.

headquarters before delivering onsite. Voice system will integrate into MS Exchange and Microsoft Active Directory.

el physical components. Install and configure IP Telephony features and applications as required by City of Missou

l by the vendor, for one or more of the following reasons:

perform the engagement as specified within this document.

y schedule, pricing, and scope of the engagement and/or deliverables.
previous fully executed Change Order Form, the terms of the most recent fully executed Change Order Form shall

ity of Missoula. If any of these assumptions prove to be invalid, the parties agree to resolve the situation via the Ch
s), with the exception of any work that would interfere with City of Missoula' business or operations such as upgrade
ent Responsibility section of the SOW are met, delivered, or provided (as appropriate) in a timely manner. Qwest is

tion

are, network access, adequate and secure workspace, and telephone access) and requested information that is de

s that may arise.
g.

d as per the project plan.
ing sessions within the City of Missoula organization unless other arrangements are agreed upon by both SPOCs.

this engagement.

s and current network infrastructure at the Kickoff meeting.

verables.
ability, all information will be complete and accurate.

n via the Change Order Process. Notwithstanding the foregoing, neither party is bound to use the Change Order Pr

ented and the results communicated in writing as soon as practical.
uture reference. Ideally, most, if not all of these stakeholders will be in attendance for the kickoff meeting.

s of the engagement.

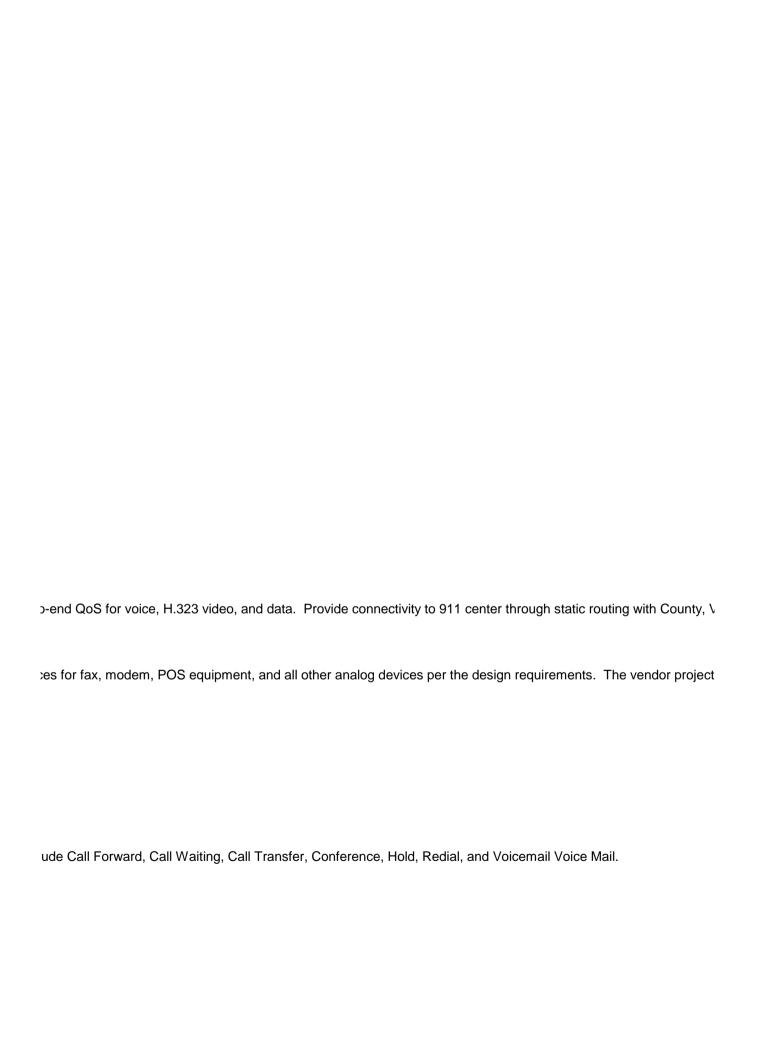at will involve City of Missoula's personnel or resources.

uals of City of Missoula. The Project Notebook will contain: a signed copy of this SOW and all Change Orders; the

tact City of Missoula personnel without the need to document these conversations. For example, conversations rel

hase order or master contract) required by City of Missoula policy at least 4 weeks prior to the initiation of work. Th

e that the vendr work will be completed in approximately 3-5 years after equipment arrives onsite. City of Missoula

of this work has already been completed.

tion/Access Layer) will be pre-staged in Helena before delivery to City of Missoula. The vendor will configure end-to

. IP Addressing for voice services use DHCP. Music on hold will be provided as part of basic install. Install interfac

ula, including Voice Mail integration on Call Manager Servers. IP Phone features to be installed and configured incl

prevail.

ange Order Process. Notwithstanding the foregoing, neither party is bound to use the Change Order Process in the
es to live equipment. The vendor assumes that there will not be any special conditions or restrictions that would aff
not anticipating the need to provide "on the job training" to City of Missoula employees throughout this project. Qw

emed necessary by the vendor to ensure that the vendor can fulfill its commitments stated within the SOW. When

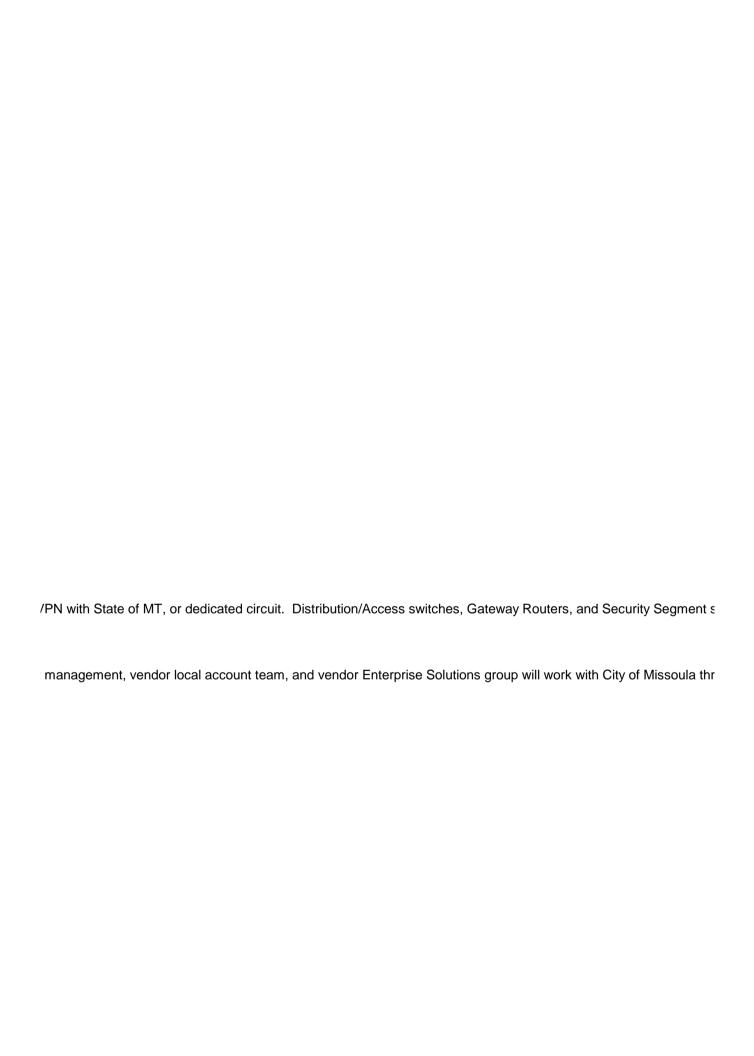ocess in the event of a material breach by the other party.

Project Plan, all Status Reports; research; deliverables; and engagement documentation. The Project Notebook wi

ated to an individual circuit will be necessary to perform this engagement but formally documenting each conversati

ie Kickoff meeting will mark the official start of this engagement.

resources and timelines will be established by the project team after contract award. During the course of this enga

-end QoS for voice, H.323 video, and data. Provide connectivity to 911 center through static routing with County, \

es for fax, modem, POS equipment, and all other analog devices per the design requirements. The vendor project

ude Call Forward, Call Waiting, Call Transfer, Conference, Hold, Redial, and Voicemail Voice Mail.

e event of a material breach by the other party.
ect a productive workday. All work will be performed contiguously unless otherwise agreed upon in the project plan
est will provide knowledge transfer as the final phase of this project. Sufficient network infrastructure exists, or will l

possible, the vendor will make reasonable efforts to provide lead-time to City of Missoula. Typically, this notificatior

ll be reviewed periodically at Status Meetings and delivered to the City of Missoula /City of Missoula SPOC at the co

on will not add value and will significantly slow progress. However, this does not negate the need to submit the app

gement additional information will be learned about the engagement that may cause the time required to complete t

/PN with State of MT, or dedicated circuit. Distribution/Access switches, Gateway Routers, and Security Segment s

management, vendor local account team, and vendor Enterprise Solutions group will work with City of Missoula thr

. All environmental conditions (e.g. power, UPS Systems, air conditioning, rack and floor space) are either currently
be provided to support the deliverables of this engagement. This includes, but is not limited to: bandwidth; connecti

will occur at the weekly status meetings. However, it may be necessary from time to time to have a faster respons

onclusion of this engagement.

ropriate documentation (work orders, etc.) for each circuit.

the engagement to differ. Changes to the Expected Duration will be addressed via the Change Order Process.

shall have redundant paths to core network segment eliminating as many single points of failure as possible (see dr

roughout from beginning to end of project.

available or will be provided City of Missoula within the agreed upon schedule for this engagement. All cables are
vity; management tools and utilities; and security. All network infrastructures such as voice and data circuits and ac

se level. In these cases City of Missoula agrees to respond within 1 day. Everyone will do his or her best to ensure

awing below).

in-place, labeled correctly, documented in a cable-management system, tested and fully comply with applicable EIA
ccess to the PSTN will be installed and configured by City of Missoula during the implementation of the IP Telephon

timely communication.

\/TIA wiring standards, the National Electrical Code, and local codes related but not limited to the use of plenum cak
y infrastructure equipment. Qwest will be responsible for the Plan, Design, and Implementation phases of the IP Te

ble, riser cable, and fire stop materials. City of Missoula's personnel will be cooperative and for
elephony components and its associated network components only. The initial dur