

RIVERCOM 9-1-1 Wenatchee, Washington Programming and Planning Study



Prepared for:

**The Board of Directors
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SCHRADERGROUP

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TABLE OF CONTENTS

Section	Description	Page
1.00	EXECUTIVE SUMMARY	
	▪ Introduction	1.1
	▪ About RiverCom 9-1-1	1.2
	▪ Building Design Philosophy	1.4
	▪ Existing Conditions Summary.....	1.5
	▪ Programming Study Summary.....	1.5
	▪ Threat Assessment Summary.....	1.7
	▪ Proposed Systems Narrative Summary.....	1.7
	▪ Concept Design Summary.....	1.8
	▪ Budget Estimate Summary.....	1.10
2.00	EXISTING CONDITIONS	
	▪ Introduction	2.1
	▪ General Construction Narrative.....	2.1
	▪ HVAC Narrative	2.2
	▪ Electrical Narrative	2.3
	▪ Plumbing/Fire Protection Narrative	2.6
	▪ Costs To Remediate Existing Conditions	2.7
	▪ Existing Facilities Survey	2.8
3.00	PROGRAMMING STUDY	
	▪ Introduction	3.1
	▪ Space Standards	3.1
	▪ Program Summary.....	3.2
	▪ Programming Worksheet	3.4
4.00	THREAT ASSESSMENT	
	▪ Introduction	4.1
	▪ Threat and Vulnerability Assessment.....	4.2

5.00 PROPOSED SYSTEMS NARRATIVE

- Overview.....5.1
- General Design Guidelines5.1
- Best Practices.....5.3
- Architectural Considerations.....5.5
- Structural Considerations5.9
- HVAC Recommendations.....5.10
- Plumbing Recommendations5.14
- Electrical Recommendations.....5.16

6.00 CONCEPT OPTIONS

- Introduction6.1
- Scenario #16.1
- Scenario #26.2
- Diagram #1 – Aerial Site Plan of the Existing Facility.....6.4
- Diagram #2 – Existing Third Floor Plan6.5
- Diagram #3 – Scenario #1 – Proposed Third Floor Plan.....6.6
- Diagram #4 – Scenario #2 – Conceptual Site Plan6.7
- Diagram #5 – Scenario #2 – Conceptual Floor Plan.....6.8

7.00 CONCEPT BUDGET ESTIMATES

- Introduction7.1
- Budget Description7.1
- Summary Budget Estimates for Each Scenario7.2
- Project Budget Worksheet7.4

8.00 APPENDIX

- Appendix Introduction..... 8-1
- Meeting Minutes – 11/28 and 11/29/18 Kick off A-1

EXECUTIVE SUMMARY

1

EXECUTIVE SUMMARY

INTRODUCTION

SCHRADERGROUP architecture (SG) was engaged by the RiverCom 9-1-1 Team to conduct a programming and planning exercise focused on developing two facility scenarios for the future of the organization. The team was brought in to conduct a comprehensive analysis and evaluation of the objectives identified below. The summary of each of these objectives and related issues are considered the essence of the project scope of this Programming and Planning Study. The team developed this Study to support the following tasks:

- Conduct a thorough programming effort to determine future space needs using current industry best practices
- Conduct a threat assessment to evaluate the existing facility and the feasibility for expansion to a state-of-the-art facility
- Conduct a facility walk through to provide a complete evaluation of all building systems within the existing RiverCom 9-1-1 facility
- Develop a Proposed Systems Narrative to describe proposed building systems for a critical infrastructure facility
- Develop a Concept Floor Plan and Site Plan for the proposed facility using two separate scenarios as defined below
- Develop a set of conceptual budgets from the design concepts and all previously provided information

To support these needs, SCHRADERGROUP enlisted the help of architecture and engineering firms from the State of Washington to lend local knowledge to the effort. The team included the following:

<u>Firm</u>	<u>Location</u>	<u>Discipline</u>
TCA Architecture	Seattle, Washington	Architecture
Sider Byers Associates	Seattle, Washington	HVAC, Plumbing/Fire Protection Engineering
Case Engineering	Bothell, Washington	Electrical Engineering

SG met with the RiverCom 9-1-1 Team to understand the needs of the organization at the end of November 2018. This kick-off meeting developed the basis from which the balance of the programming process would occur. A programming workshop focused on understanding the proposed operations of the organization and how those operations might translate into renovation of and additions to the existing facility was part of this Workshop. Extensive conversation occurred throughout this process focusing on the feasibility of the existing facility for the continued use.

A site tour of the existing facility was conducted by the various engineering disciplines during the timeframe of the Workshop. Existing conditions were developed from this visit. A preliminary Threat and Vulnerability workshop was held with the design team and Owner and from this exercise, the Threat Assessment portion of this document is derived. With this information, proposed systems narratives were developed.

The diagrams in this study attempt to provide some form to the programming effort undertaken in November 2018 in order to; (1) test the program within the existing facility and also to (2) develop a potential new facility on a “Greenfield Site”. This information was shared with County representatives in February. The balance of this document supports the overall programming effort undertaken by the team throughout this process.

ABOUT RIVERCOM 9-1-1 (from the RiverCom 9-1-1 website)

RiverCom is a multi-jurisdictional Public Safety Answering Point (PSAP) that operates twenty-four hours a day, seven days a week processing emergency 911 and non-emergency calls for service and dispatching twenty-three (23) law, fire, and emergency medical public safety agencies within Chelan and Douglas counties. RiverCom was officially formed in 2002 and became operational as a dispatch center in July 2004. RiverCom provides the following services:

- Emergency dispatch services for customer law enforcement agencies, fire districts and departments, and public and/or private ambulance services
- Information services from the Washington State Patrol Law Enforcement Data Communications System to customer law enforcement agencies.
- Answer, monitor, and dispatch services to assist customer agencies in responding to public safety emergencies and other calls for assistance.

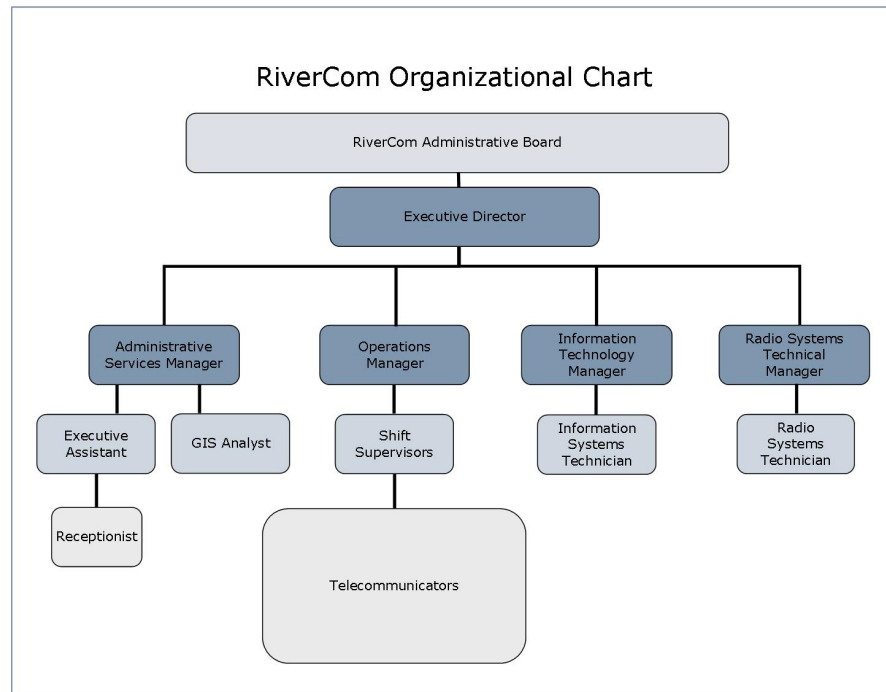
RiverCom is one of sixty-nine (69) Public Safety Answering Points (PSAP) operating in Washington State. RiverCom serves as the regional 911 point-of-contact and is the only 911 communications agency by which all public safety agencies in Chelan and Douglas counties respond. Located in Wenatchee, Washington,

RiverCom’s service area covers approximately 4,741 square miles—from Stevens Pass to Blewett Pass and from Grand Coulee Dam to Crescent Bar and serves a population of about 115,000 residents. In 2017, RiverCom processed about 50,000 9-1-1 calls (not including non-emergency calls for service).

RiverCom is a municipal corporation and is organized as a separate legal entity as authorized by Washington State Constitution and the laws of the State of Washington under RCW 39.34.030 (3)b. RiverCom is an agency independent of the various agencies it serves and is exclusively governed by the RiverCom Administrative Board.

PERSONNEL

RiverCom maintains about forty (40) full-time employees covering Administrative, Information Technology, Radio Systems, GIS, and Telecommunicator positions. Telecommunicators provide the first line of contact with the public when calling for emergency and non-emergency public safety services.



9-1-1 RADIO COMMUNICATIONS SYSTEM

In addition to dispatch services, RiverCom is responsible for the mission-critical responsibility of maintaining a regional 911 communications systems that covers a wide range of geographical features and terrain.

RiverCom operates and maintains a two-county public safety radio system comprised of nineteen (19) radio sites throughout Chelan and Douglas counties. Compared to any other 911 agency operating in the state,

RiverCom's two-county radio system provides the largest expanse of coverage in the state of Washington

BUILDING DESIGN PHILOSOPHY

In accordance with current communication and emergency operations facility best practices, the proposed building renovations or new construction will be developed to house the functions of the RiverCom 9-1-1 Agency. All administrative, technology and common spaces required to support the functions are also included in this study.

Since the facility will house an emergency communications center center the building must provide for all disaster related operations (within the capabilities of the existing building structure). Disaster related operations are defined as periods of natural and civil disaster where normal building access and services may be temporarily disrupted.

Construction should:

- Consider the most economical solution to the proposed construction project
- Consider cost effectiveness of operations when evaluating capital expenditures
- Consider near and long-term environmental impact when evaluating capital expenditures
- Provide the space required to adequately deliver Public Safety Services to the Region
- Provide appropriate levels of sustainability and survivability to maintain the critical operations of the facility (within the capabilities of the existing facility's construction)
- Provide an ergonomically appropriate facility that considers the extended periods of use by personnel

The balance of this Section provides a brief summary of each of the Sections included in this overall document.

SUMMARIES & CONCLUSIONS

Existing Conditions

One of the first tasks required of the SCHRADERGROUP (SG) planning team was an assessment of existing conditions at RiverCom 9-1-1. The intent was to assess physical conditions of the existing space as well as the building systems (HVAC, Electrical and Plumbing/ Fire Protection). The team was specifically assembled for their experience assessing and designing redundant and survivable facilities. The assessment is geared to reflect those specific goals.

The findings of the team are noted in the narrative below, then are further expanded upon in the assessment worksheets where a preliminary order-of-magnitude cost is assessed to each of the components requiring upgrade. This information is further expounded on in Section 5 – Proposed Building System Narrative. That section attempts to proposed upgrades that might be considered for the proposed existing RiverCom 9-1-1 facility as well as systems that would typically be installed in a new hardened, redundant facility serving this function in this region.

In the interest of providing a report that builds upon itself, this section establishes a baseline to understand challenges proposed by the building systems in the facility. These concerns are described for systems only and do not consider dimensional or missing space issues that are further defined later in this document thought the programming and concept options section.

Program Summary

The SCHRADERGROUP (SG) planning team worked with a team comprised of representatives from RiverCom 9-1-1 in November of 2018 to develop preliminary space programs for a facility representing current standards in the industry. The goal was to determine anticipated future space needs for the proposed RIVERCOM 9-1-1 Facility. The programming effort was conducted with the intent of deciding if the current facility located above Police Headquarters would continue to suffice or whether the group should consider and alternative location.

The overall goal for the facility is to provide emergency services for the residents supported by RiverCom 9-1-1, to include; emergency communications and all support services for those functions. Of interest to RiverCom 9-1-1 was the comparison of the existing building areas supporting the agency functions vs those areas generally required to serve the same function. The planning team attempted to gather the existing building areas from a plan provided to them and included those area comparisons in the programming documents.

Once facility needs were derived and future programs were established, the design team developed the proposed overall building areas required for each of the functions. The results of the programming study are included in Section 3.

The programming information is used as the basis for locating these functions within the concept plans developed later in this document. What follows are all of the building elements anticipated for the proposed facility. The Concept Design Options identified in Section 6 of this document and the Concept Budgets described in Section 7 of this document reflect the building program outlined here.

Following the programming workshop, a program document was developed. Ultimately the program document (provided beginning on page 3-4) breaks the facility into 5 major components. Those components are also measured against the area currently assigned for those uses within the existing facility in the worksheets. The gross square footage program for a current communication facility serving a comparable function is as follows:

MAIN BUILDING

Administration	3,204 s.f.
Operations	2,297 s.f.
Training	769 s.f.
Technology	2,302 s.f.
Common Spaces	3,926 s.f.
<hr/>	
Subtotal	12,497 Net Square Feet
Net to Gross Conversion	1,250 s.f.
<hr/>	
TOTAL PROPOSED BUILDING AREA	13,747 Gross Square Feet

As previously noted, the planning team attempted to calculate the existing building area of the police station currently being used by RiverCom 9-1-1. The calculation was developed using direct building areas for the spaces on the floor that are identifiable, coupled with a percentage calculation of building system services (mechanical, electrical etc.) that are shared by the building as a whole. The direct building areas calculated are approximately 7,245 s.f. of area. It could be assumed that an additional 600 s.f. or so would be required for mechanical and electrical space bringing the subtotal to 7,845 s.f.. Utilizing the same methodology of building gross square footage increase as utilized for the proposed new facility programming, 10% would be added to the total. So, total building area utilized within the police building's footprint could reach 7,845 s.f. + 10% is 8,630 s.f.. So, the appropriate comparison of area currently used by RiverCom 9-1-1 vs. the programmed space would be 8,630 s.f. vs the 13,747 program s.f. or a current approximate shortage of 5,117 s.f.

Threat Assessment

This section includes a Threat Assessment developed for the existing site and building analyzed for this Study. The team decided that without a new “greenfield” site to analyze that the analysis would be performed for the existing facility located in the Police Department building. The Threat Assessment is performed in general conformance with FEMA 452 Risk Assessment criteria. Topics similar to those identified in the FEMA document are addressed however they are addressed in a format more specific to this site and this specific use.

This assessment was performed in two phases. The RiverCom 9-1-1 team was engaged in an analysis of the risks during the workshop activities in November. The design team then took those risks and concerns and developed the mitigation strategies specific to the existing building.

What follows is an assessment for the proposed site. The design team has taken the Threat Assessments plus the requirements that we believe are applicable to a mission critical facility in this region and have modified the assessment to reflect those issues. The document assigns a probability of a risk (as determined by the design team members and members of RiverCom 9-1-1 staff) for this site, and then provides an assessment of the importance of that occurrence to the operations of the facility. Following that, mitigation strategies are provided for the design of the facility. The results create the basis for architecture and engineering considerations provided in Section 5.

To some extent, the majority of threats to the proposed site for this project are natural forces or weather-related incidents. There is always some concern for continuity of operations issues generated by manmade threats, however weather threats dominate the concern. This threat assessment recognizes those concerns and attempts to provide mitigating strategies to counteract them.

Actual remediation efforts for any of the perceived threats are included on the following pages and in Section 5 to follow.

Proposed Systems Narrative

This Programming and Planning Study has been prepared to assess the current and future needs of the RiverCom facility and make recommendations whether to modify the existing facility or relocate to a different facility. The facility is located on the top floor of the Wenatchee Police Department building and houses administrative offices for the organization, and contains the communications center, and all support functions. These facilities typically utilize hardened, redundant and survivable construction and systems.

The facility is required to satisfy the International Building Code (IBC) and the Revised code of Washington State (RCW) based on the time of its construction in addition to meeting all associated ancillary Codes. Beyond those requirements, there are a separate

set of criteria and recommendations which are considered when evaluating existing building systems. The first criteria indicated under the IBC, is that the facility will be required to satisfy Essential Facility requirements of the code which increases the seismic criteria and wind loading. Second, however, are a series of additional recommendations and best practices that come into play to help develop the ultimate systems which should optimally be utilized in these types of facilities.

The balance of this section identifies specific criteria that should be utilized when considering the facility's ability to support the community and staff to serve as a regional communications and operations center during an event.

Concept Design Summary

The focus of this study was to develop a state-of-the-art program specifically for RiverCom 9-1-1's Communications facility and then to test it in two scenarios. The first scenario is to test the program within the confines of the existing facility plus whatever space it takes to accommodate most of the proposed program. This encompasses the existing space plus the gym space currently utilized by the police department on the third floor of the Wenatchee Police Department/ RiverCom 9-1-1 facility. The second scenario includes test fitting the program on a "green-field" site. The term "greenfield site" is proposed for any property acquired by RiverCom 9-1-1 where a new facility and appropriate site work might be constructed. This option is fairly generic because no property was proposed to consider for development.

Given the capabilities and building area of the existing space occupied by RiverCom 9-1-1, the goal for Scenario #1 was to further decide what additional space might be required within the existing bounds of the building footprint to accommodate the given program. The planning team was tasked with developing a concept diagram reflecting the programming effort outlined in Section 3 of this document and then to test the concept diagram.

With the building area requirements established, the next step was to determine if both the existing building and a "greenfield site" might also be reconfigured to accommodate the modified needs of the RiverCom 9-1-1 program. The team located typical site amenities as well as site hardening components to determine if all could be accommodated in the new scenarios.

Scenario #1 – Renovation and Expansion of the Existing Facility within the Third Floor Footprint

The existing RiverCom 9-1-1 facility is located on the third floor of the Wenatchee Police Department building located at 140 South Mission St., Wenatchee, Washington. The site is bound by an alley directly to the west and then South Chelan Avenue, by South Mission Street to the East, by Yakima Street to the south and by its own parking lot and then Orlando Avenue to the north. Given its third-floor location the facility is land (and building) – locked and so expansion beyond the footprint is impossible.

Within the third floor footprint, RiverCom 9-1-1 utilizes approximately 50% of the third-floor space. The balance of the floor space is occupied by the gym and the locker rooms for the Wenatchee Police Department. For the sake of this study, no specific

space was offered up to investigate expansion within however the planning team elected to pick space that had the greatest opportunity for expansion while disturbing as little of the police function as possible.

Given the intent of reducing cost impact and disturbing as little functional space as possible, the planning team elected to propose expansion of the program into the existing gymnasium while providing for a corridor around that space to allow police officer access to the locker rooms. Obviously, reduction of police function will not be looked upon favorably however it is the least disruptive expansion possible within the footprint of this facility.

Again, in the interest of minimizing expansion, many areas of the proposed concept compromise building area projected for the functional use of the organization as shown in the program developed in Section 3 of this document. The drawings included below show the composite program expanding within the gym footprint mostly to allow for the accommodation of IT support personnel spaces. Other program areas are modified subtly to reflect a relative improvement to the facility for the RiverCom 9-1-1 personnel.

The building area used on the third floor of the current Wenatchee Police Department for this concept plus the conference room on the lower floor allows for approximately 8,785 s.f. of Gross Program Area. It could be assumed that 600 s.f. of building support space (MEP Area) is dedicated to the RiverCom 9-1-1 function. That total suggests $8,785 \text{ s.f.} + 600 \text{ s.f.} = 9,385 \text{ s.f.}$. Then, utilizing the 10% building GSF it brings the total proposed building area of 10,323 total square feet. The Program identified in Section 3 shows a Gross Programmed Building Square Footage of approximately 13,747 s.f. The difference between that which can be housed within the existing third floor footprint (and other areas) and the state-of-the-art program is approximately 3,423 s.f. Areas that are missing or short of square footage are identified on the drawing provided in this section.

The missing square footage for the program is already a compromise from the proposed Building Program identified in Section 3. Further, the building systems identified in Section 2 that require upgrades or improvements have a cost to begin to meet the code requirements and recommendations for a state-of-the-art Communication Facility. As the agency evolves there may be space challenges as well as building system challenges if the agency renovates the existing facility.

Concept drawings for the proposed renovations and expansion follow in this section.

Scenario #2 – Greenfield Site Concept

The original intent of the “greenfield site” concept was that several sites might be identified around the City of Wenatchee to test-fit the building program and site program on. Given the timing of the study it does not appear that sites appropriate to this need have been identified. Therefore, in the interest of providing some level of conceptualization and budgeting for the location of the facility on a new site, the team has conceptualized a facility on a flat parcel of approximately 5 acres somewhere in the Wenatchee area.

Budget Estimate Summary

Section 3 of this document provides an architectural program developed through the Programming Workshop. As previously noted, the intent of this study is to evaluate two scenarios for the future of RiverCom 9-1-1. Scenario #1 is to continue operations of the agency within the confines of the third floor but with some expansion into the Wenatchee police fitness area to allow for part of the expansion required by the programming effort. Scenario #2 is the construction of a new facility somewhere in the Wenatchee area.

The two scenarios are estimated separately in this document. Several caveats; as noted in other areas of this document:

- Scenario #1 does not provide for the full program developed and provided in Section 3 of this document. So, there is inequality between the two Scenarios.
- Technology costs are not provided in these estimates. Technology can have a significant impact on budgeting for projects such as these, specifically because of the need to maintain operations in the existing facility as well as the new facility throughout the cutover.

For the costs identified in this Section, SCHRADERGROUP utilized line item cost estimating techniques based on the CSI format to complete an estimate that correlates to the concept diagram and site diagram provided in Section 6. Local construction costs, escalation, general site information and knowledge of current construction pricing of communication facilities are included (as much as can be anticipated) in the estimates shown on the pages of this section. The costs included are for budgeting purposes only as no final design has been derived at this time, but the team obviously had the benefit of the concept diagram to work from. Escalation is included to a hypothetical midpoint of construction at a total of 5.00% annually in the estimates.

When the design process has begun, more accurate cost estimate information will be generated.

Budget estimating includes items discussed in the Workshop Session and in the Systems Narrative described in other sections of this document. Note that all costs described in this document and all associated systems are considered to be part of this conceptual budget (with those exceptions described in “Exceptions and Clarifications” below).

The estimates included herein are line item conceptual budget estimates and are broken down to depict several of the types of project costs. The types of cost areas are described below:

Overall Budget Description

The overall budget includes the following:

- **CONSTRUCTION BUDGET** – Includes anticipated construction costs broken down to support the program area. HVAC and Electrical systems will be one of the greatest variables depending upon what type of HVAC system is selected. The total extent of renovations will also be a major variable.
- **DESIGN COSTS** – Includes anticipated project design costs including the testing services normally anticipated for a project of this type.
- **PERMIT COSTS** – Permit costs were excluded from this set of budget worksheets as the design team was directed to exclude those at this time.
- **TECHNOLOGY SYSTEMS & OTHER COSTS** – RiverCom 9-1-1 provided the estimates for the technology budgets. The required technology and costs will vary widely as some costs are in annualized budgets for the renovation scenario but for new construction, almost all new technology would be required in order to phase the move into a hot cutover. General building furniture is included in this breakout as well. As the project evolves there may be further development that modifies the technology needs.
- **CONTINGENCY** – Readers will note a 10% project contingency which is common at this stage of the project.

Obviously, no programming phase budget can anticipate all of the project costs that may arise during a design and construction process however the SCHRADERGROUP team's knowledge of this project type provides significant insight into the various project costs typically experienced. The hope is that these budgets provide a good foundation from which the Owner can begin their decision-making process.

The Summary TOTAL CONCEPT PROJECT BUDGETS are shown on the pages to follow for the two Project Concept Scenarios. They are then expanded upon in the individual budget worksheets to further describe the potential costs for each phase of the work following those pages.

SCENARIO #1 BUDGET ESTIMATE – Renovation within Current Facility

Cost Per Breakout	
Construction	\$ 1,070,586
Professional Costs	\$ 133,117
Technology and Equipment	\$ 1,956,400
Contingency	<u>\$ 316,010</u>
Total Conceptual Project Budget	\$ 3,476,113

SCENARIO #2 BUDGET ESTIMATE – New Facility on a “Greenfield” Site

Cost Per Breakout	
Construction	\$ 6,916,047
Professional Costs	\$ 805,345
Technology and Equipment	\$ 2,006,800
Contingency	<u>\$ 972,819</u>
Total Conceptual Project Budget	\$10,701,011

Overall Summary

The Planning Team has been privileged to work with the RiverCom 9-1-1 Team on this Study. The concern for enhancing the level of services for the Citizens of the Region was evident throughout the process. We look forward to an opportunity to further support the agency with respect to this Study and its outcomes in any way that we can.

EXISTING CONDITIONS

INTRODUCTION

One of the first tasks required of the SCHRADERGROUP (SG) planning team was an assessment of existing conditions at RiverCom 9-1-1. The intent was to assess physical conditions of the existing space as well as the building systems (HVAC, Electrical and Plumbing/ Fire Protection). The team was specifically assembled for their experience assessing and designing redundant and survivable facilities. The assessment is geared to reflect those specific goals.

The findings of the team are noted in the narrative below, then are further expanded upon in the assessment worksheets where a preliminary order-of-magnitude cost is assessed to each of the components requiring upgrade. This information is further expounded on in Section 5 – Proposed Building System Narrative. That section attempts to proposed upgrades that might be considered for the proposed existing RiverCom 9-1-1 facility as well as systems that would typically be installed in a new hardened, redundant facility serving this function in this region.

In the interest of providing a report that builds upon itself, this section establishes a baseline to understand challenges proposed by the building systems in the facility. These concerns are described for systems only and do not consider dimensional or missing space issues that are further defined later in this document thought the programming and concept options section.

EXISTING CONDITIONS

The existing conditions narrative information provided below is repeated in Section 5 – Proposed Building Systems Narrative. It is scattered though that section of the document only to support the improvements suggested for the existing conditions. It is further supplemented in that section through analysis of typical systems proposed for facilities of this type. That section provides a better understanding of what a new standalone facility would consist of. This section focuses on the issues related to the current facility only.

GENERAL CONSTRUCTION NARRATIVE

When assessing the condition of the RiverCom facility it should have the ability to accommodate any planned or reasonably anticipated future expansion of either the building itself or the number of stations in the communication center and associated equipment in the Server Room. While aesthetically the current facility is in good condition, the existing available space is stressed beyond capacity without any consideration of future growth needs. While there may be the ability to expand the facility's footprint,

this would be at the expense of other programmatic needs currently occupied by the Police Department which would be challenging. The current equipment room floor allows for expansion of equipment and migration of systems within racks.

From a finish perspective the facility is well designed. Materials typical to this function are utilized throughout however they are aging as the facility has been in place for some time. The replacement cost noted in the document attached, reflect typical life span replacements of finishes associated with public buildings.

There is a general issue with the site parking as it does not allow for full shift change parking for the RiverCom 9-1-1 staff when coupled with the entire Wenatchee Police force shift change. The site is difficult to hardened as it is in an urban environment and thus surrounded by streets and alleys. The threat assessment provide in Section 4 amplifies this issue.

From a secure entry standpoint, there is no true secure vestibule to the facility. RiverCom- 9-1-1 has a secondary door that allows access into the elevators. The stairwell does provide access control doors however none are considered hardened. Further, the partitions surrounding the RiverCom 9-1-1 spaces are not floor to ceiling. The partitions terminate at the ceiling system. Those partitions are also typical drywall construction and thus do not secure the inhabitants from penetration from the outside. Any occupant or visitor to the facility who made it past one of the access-controlled doors could easily find their way into the facility through one of the wall systems.

There is a further issue with respect to the windows surrounding the 9-1-1 Center itself. Communication Centers today emphasize daylight and views however the windows surrounding the center do not provide hardening against firearms, nor do they reduce the opportunity to eliminate visual access of data from surrounding facilities.

HVAC NARRATIVE

RiverCom is housed on the third floor of the Wenatchee Police Station building built in 2003. This facility was not purpose built to contain a 911 center but adapted to accommodate. The most significant mechanical issue this causes is that RiverCom does not have direct control over the building systems serving their space and it limits the scope of corrections that can be made.

The building is served by a central VAV (variable air volume) air handling system with split DX cooling and hot water heating. VAV zones are fan-less terminal boxes with hot water reheat. Hot water is supplied by central natural gas boilers. This system is of institutional quality with adequate zoning.

While this is an excellent building system, because RiverCom doesn't have control over its operation, there are temperature control issues with limited adjustment, slow temperature response, and some spaces not reaching the desired setpoint. Additionally, a building pressurization control issue causes the exterior security door not to latch on some occasions due to excess interior pressure relieving through the door.

Dispatch

The area is served by a zone of the building VAV system. Two split-system fan coils are intended to provide redundant conditioning. The control and function of the redundant fan coils was not known. We recommend providing maintenance, repair and training for the redundant fan coils.

Offices

Each office is served by an individual zone of the building VAV system. While this is excellent zoning, capacity or control issues often result in uncomfortable temperatures. We recommend adjustments to the building HVAC control programming.

Equipment Room

The space is served by a dedicated Liebert unit with local control and has generator backup power. Redundant cooling is provided by the building VAV system, although switchover is not automatic, and the building system is not on generator power. Capacity is adequate for current and future needs. We recommend providing true redundant HVAC system with automatic switchover and generator backup power.

Fire protection is provided by the same pre-action system as Dispatch. We recommend an independent chemical agent suppression system in lieu of sprinklers.

Break Room / Kitchen

The room is an independent zone served by the building VAV system. No exhaust is present which sometimes results in odors. Only a small sink is present and no dishwasher. We recommend providing local exhaust and a dishwasher.

Utilities

The facility design will need to consider the loss of utility delivered fuels that are used as the source of building heating system and/or emergency generator. Natural gas will likely remain as the primary fuel source with propane as a possible option for a back-up source if needed. This should be further discussed when actual design for this facility ensues.

ELECTRICAL NARRATIVE

The existing call center shares the electrical service with the police station. The electrical service consists of a 1200A, 480Y/277 volt, 3-phase, 4-wire service switchboard. The maximum demand for the previous 30 days was 103.7 kW, or around 140 amps at 0.9 power factor. The service size for this building is adequate for the use and would accommodate load modifications to the existing facility, assuming no building additions of considerable size are made.

Primary power is fed to a pad-mounted transformer via an adjacent vault, which is fed underground from a pole at the SE corner of Yakima and Chelan. The primary service is fed overhead from Chelan County PUD to this pole. The secondary service from

the transformer to the building is via a concrete encased secondary ductbank and the CT compartment is located within the building on the garage level. The PUD transformer should be replaced with one rated for below-ground use, mounted in a below-grade vault to avoid the possibility of damage and flooding of transformer compartments.

Dual power supply from the utility may be desired by the Owner to provide increased electrical service reliability. Further coordination is required to determine this. A dual utility power supply for the existing building is not feasible due to space restraints for a second service switchboard with utility metering and a tie breaker between it and the existing switchboard.

The main service switchboard in the existing facility contains (5) circuit breakers (main service disconnects), with one 600A/3P circuit breaker feeding the standby section via an automatic transfer switch. The standby section contains a surge protective device and several circuit breakers that do not contain an adjustable trip unit. A fault on any of these feeders without an adjustable trip breaker could trip the 600A/3P circuit breaker feeding the standby switchgear section and possibly the generator output breaker.

The main service switchboard supplies power to the normal loads and the standby loads via an optional standby (NEC 702) automatic transfer switch. The entire 911 call center and supporting areas are fed from the optional standby generator. Instead of an emergency (NEC 700) transfer switch, the emergency loads (emergency egress lighting and fire alarm control panel) contain integral battery backup for the required 90 minutes.

The panelboards feeding the 911 call center functions are all located in the 3rd floor equipment/server room. The panelboards do not have door-in-door covers, which are not a safety concern, just an increase in time required for troubleshooting evaluations. Based on the record documents, the panelboards were specified with copper bus bars, equipment ground busses and bolt-on molded case circuit breakers. The current-carrying conductors appear to be copper, which comply with the record drawings.

The feeders and branch circuits in the existing facility comply with requirements of a redundant, hardened facility except for the following:

- Final connections to vibrating equipment such as motors and transformers utilize flexible metal conduit (not liquid tight).
- EMT fittings are set-screw type.
- Conductors installed underneath the raised floor areas are installed in flexible metal conduit (not liquid tight).

The standby system for the existing facility consists of a 300 kW/375 kVA, 480Y/277 volt, 3-phase, 4-wire diesel generator with a 520 gallon sub-base fuel tank. The generator's fuel consumption is approximately 23.1 gallons/hour at full load, so the tank would supply the generator for a total of 22.5 hours. The generator is located in the SW corner of the first floor with access through the secured parking garage. The generator calculated demand load of 294.0 kVA. (The maximum demand as measured by Chelan County PUD for the previous 30 days was 103.7 kW, or around 140 amps at 0.9 power factor for the entire facility.) There is not a separate automatic transfer switch for the emergency system (NEC 700). Instead, the emergency loads (emergency egress lighting and fire alarm control panel) have integral battery backup. The remaining 911 call center loads are

connected to the optional standby (NEC 702) automatic transfer switch and will be connected to the generator upon loss of normal utility power.

The generator room was originally sized to accommodate a second, 100 kW/125 kVA diesel generator. This generator was going to serve as a redundant backup to the main 300 kW generator via a manual transfer switch. This second generator was not installed but the space in the generator room remains vacant. The redundant generator could potentially be installed where originally designed and a feeder could be routed to the existing manual transfer switch. Since the generator connection would not be through an automatic transfer switch, the generator size could be sized for the actual demand load (using 30-day demand metering) vs. the calculated load per the NEC.

A larger fuel tank should be considered to achieve 72 hours of runtime at full load.

The UPS and maintenance bypass switch are located in the 3rd floor equipment/server room and, according to the record drawings, is rated 24 kW/30 kVA. The UPS battery bank is located on the first floor with access via the secure parking garage, which is practically the furthest point in the facility from the UPS and bypass switch. The batteries are also located directly adjacent to the ammunition storage room. To decrease the potential disruption of service to the UPS, consideration should be made to relocate the battery racks to a location closer to the UPS and further away from the ammunition storage. According to the record drawings, the calculated demand load on the UPS is 36.0 kVA, or 100 amps at 208Y/120 volts, 3-phase. This exceeds the rating of the UPS and the 70A/3P main circuit breaker on the PSAP – Building UPS Distribution Panel. The UPS load should be monitored for a minimum of 30 days to verify that the system is not overloaded or approaching an overload condition.

Grounding to server racks and dispatch workstations should be modified to meet R56 standards.

Article 708 was added to the National Electrical Code in the 2008 edition, after this facility was built. Major electrical modifications would be required in order to bring this building up to NEC 708 compliance, including the following:

- Existing feeder and HVAC wiring for the PSAP area would be required to be changed to a listed electrical circuit protective system with a minimum 2-hour fire rating, consisting of a listed assembly or concrete encasement. Similar requirements for the fire alarm wiring.
- The rating of the spaces enclosing the normal and emergency power distribution equipment would be increased to 2-hour fire resistance rating and shall be located above 100-year floodplain. This may not be feasible.
- Surge protective devices would be required at all facility distribution voltage levels.
- Means to connect a portable or vehicle-mounted generator would be required, including an additional manual transfer switch.
- Additional generator fuel storage would be required for a run time of 72 hours minimum.

Due to the existing conditions, providing the changes required for NEC 708 compliance would not be feasible in this building.

A short circuit calculation was performed prior to construction and the rating of the electrical equipment complies. The arc flash study requirements were not included in the NEC at the time of construction, so a study should be completed, and permanent

labels affixed to the equipment for safety of the maintenance personnel. Selective coordination was not required for this facility, so not all overcurrent devices are adjustable. A coordination study should be performed for the adjustable breakers to achieve the highest level of coordination possible with the existing equipment.

The lighting systems in the existing 911 call center portion of the building consist of fixtures utilizing primarily fluorescent and compact fluorescent lamps. The automatic-off requirement of the energy code was not required for all occupancies during the time of construction, so only the restrooms have this feature. To achieve possible energy savings and desired controllability, all fixtures should be replaced with fixtures utilizing LED lamp technology and localized, low-voltage controls should be added. Indirect fixtures and increased user controls should be added to the dispatch area for increased comfort and ergonomics. Egress and exit lighting shall contain integral battery backup since an emergency automatic transfer switch is not present.

It is estimated that the lighting levels around the building and in the parking areas is under 4 footcandles, which does not meet the best practices recommendations for mitigating risk. Additional lighting fixtures or an alteration of the existing fixtures would be required to meet these lighting levels. A study would be required to determine if these lighting levels are possible under the current Washington State Energy Code.

The receptacles noted during the site survey comply with the typical requirements of a hardened, redundant facility, except the vending machine receptacles which are not GFCI-protected (not required at the time of construction). The vending machine receptacles can be changed to GFCI type with minimal expense.

A full lightning and grounding system consisting of the components required for a facility of this type is present on building and connected to the ground bus at the main switchboard.

All voice/data, audio visual, video surveillance, door access and communication systems are existing in the building. The telecommunication services enter the building on the 1st floor in Telecomm Room 123. The card access system is shared with the police station and should be replaced with dedicated system for call center.

Seismic restraints should be added to the switchboard and generator. Seismic support should be added to the lighting in the dispatch area. Server racks should be replaced with seismic-rated type.

PLUMBING/ FIRE PROTECTION NARRATIVE

Plumbing water and waste services are provided by municipal utility. Domestic hot water is generated by building central natural gas water heater. No corrections are recommended.

The building is equipped throughout with a sprinkler system. The RiverCom operation area has a pre-action system with an abort button. Notification of pre-action release is not apparent in the space, only at the control panel. A separate "agent release" device is present next to the abort button, but its function is unknown. We recommend that pre-action notification, particularly at

the abort button be provided with instructional signage. The function of the "agent release" device should be determined, and instruction provided.

COSTS TO REMEDIATE EXISTING CONDITIONS

Utilizing the worksheets provide in this section, the team was able to assign basic system upgrade costs or square foot costs to provide a hardened, redundant facility consistent with the requirements of the typical communication center in this region. The costs associated with those upgrades are as follows:

Construction Upgrades	\$ 891,853
Soft Costs @ 30%	\$ 267,556
<hr/>	
TOTAL CONCEPTUAL UPGRADE COSTS	\$ 1,159,409

The information provided in this section is intended to establish a baseline of understanding for the costs to remediate deficiencies in the current facility typically required for hardened, redundant communication facilities in this region. It also establishes a baseline renovation cost for the renovation and expansion option provided in Section 6 – Concept Options and further, the Concept Budgets provided in Section 7 – Concept Budget.

EXISTING FACILITIES SURVEY

Owner:	RiverCom 911
Address:	140 S Mission St, Wenatchee, WA 98801
Building Erection Date:	2006
Survey Date:	11.29.2018

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
General Comments - Building, Site and Infrastructure								
Site	Parking Lot	fair	appears to have inadequate parking	validate future programmatic need	-	acres	-	\$ -
		poor	parking is unsecure	validate future programmatic need	-	acres	-	\$ -
		fair	future parking lot work may need to address surface water management	validate future programmatic need	-	acres	-	\$ -
	Entrance Point	fair	unclear point of entry and point of arrival	validate future programmatic need	1	l.s.	60,000.00	\$ 60,000
Structure	Exterior	good	building exterior is well maintained	None	-	l.s.	-	\$ -
		fair	exterior does not appear to be hardened	review programmatic goals and threat	-	l.s.	-	\$ -
Building Classifications	Code Data	good	Construction Type: II-N, Police Station - Occupancy Group B, Parking Garage - Group S-3	N/A	-		-	\$ -
		poor	several areas such as the back-up battery room, munitions storage, and parking garage may need rated separations	review separations of individual spaces and then the building as a whole when the facility is reprogrammed.	1		l.s.	\$ 20,000
HVAC	Central System	good	The building is served by a central VAV air handling system with split DX cooling and hot water heating. VAV zones are fan-less terminal boxes with hot water reheat. Hot water is supplied by central natural gas boilers. This system is of institutional quality with adequate zoning.	RiverCom as a building tenant does not have direct control over the operation of the building HVAC system. This results in temperature control issues with limited adjustment, slow temperature response and some spaces not reaching desired setpoint. RiverCom should have direct control of the HVAC systems serving their space. Building pressurization control issue causes exterior security door not to latch on some occasions. It is likely not feasible for RiverCom to be given control of the building HVAC. RiverCom can not directly address the pressurization issues but it should be rectified by the building Owner.	-	s.f.	-	\$ -
Plumbing	Water Service	good	Domestic water is provided by municipal water utility. Domestic hot water is provided by building central natural gas water heater. Waste connects to municipal sanitary sewer.	None	-	s.f.	-	\$ -

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
Lighting	Interior - Support Areas	good	Support area utilizes T8 fluorescents and compact fluorescent downlights. Adequate lighting levels.	Could replace with LED's for energy savings	2,050	s.f.	7.50	\$ 15,375
	Interior - Dispatch	fair	Dispatch lighting includes combination of fluorescent pendant uplights (turned off at time of survey) and cylinder downlights with paper taped to sides for light shield.	Replace with LED indirect fixtures with dimming.	700	s.f.	9.50	\$ 6,650
	Exterior	good	Adequate - Governed by Energy Code	None	-	l.s.	-	\$ -
Electrical	Electrical Service	poor	1200A, 480Y/277 volt, 3-phase, 4-wire service from Chelan Co. PUD, shared with police department. Max demand for previous 30 days = 103.7 kW, or around 140 amps at 0.9 pf. 480V service breakers are adjustable to provide selective coordination, except new breaker installed for 3rd floor panel. Primary power is fed to transformer via adjacent vault. Vault is fed underground from pole at SE corner of Yakima and Chelan.	PUD transformer is pad-mounted and is located at the SW corner of the building across the alley. Owner stated that the utility power is lost during flash floods. The PUD transformer should be replaced with one rated for below-ground use to avoid issue, mounted in a below-grade vault	1	l.s.	60,000.00	\$ 60,000
	Generator Standby	poor	Call center shares backup power with Police Department. Generator is rated 300 kW/375 kVA at 480Y/277 volt, 3-phase, 4-wire. Generator serves both emergency (NEC 700) and optional standby (NEC 702) loads, with a single 600A automatic transfer switch. ATS feeds a 600A emergency switchboard 'ESB'. Circuit breakers in ESB are not adjustable and do not allow for a selectively coordinated system. 520 gallon tank.	A separate generator should be added to service the PSAP equipment only with an automatic transfer switch installed to switch between power sources. The fuel tank should be sized for a 72-hour runtime. Non-adjustable breaker should be replaced to achieve selective coordination.	1	l.s.	115,000.00	\$ 115,000
	UPS System	fair	Call center served by 24 kW/30 kVA 208Y/120 volt UPS system. There are two 20A/3P circuits in UPS distribution panel feeding panels on floors 1 and 2. Batteries are located in room off garage, furthest part of building from UPS.	Relocate UPS batteries for security	1	l.s.	30,000.00	\$ 30,000
	Branch Panels	good	All circuits in dispatch and support areas are on generator backup. Additional branch are required in call center	Add transformer and panel in 3rd floor equipment room	1	l.s.	7,500.00	\$ 7,500

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
Fire Alarm	Head End Panel/ Devices	good	Gentex system with FACP located in Telecom Room 123, 1st floor. Fire alarm annunciator located in dispatch room along with pre-action system manual emergency release and abort station. Pre-action control panel located in Room 332 per drawings. System shared with Police Department.	None	-	s.f.	-	\$ -
Telecommunications	PA System	good	Separate phone system with speakers throughout space.	None	-	l.s.	-	\$ -
	Master Clock	good	Dedicated clock system for Call Center.	None	-	l.s.	-	\$ -
	CATV	good	Cameras throughout suite. Exterior fuses tripping	None	-	s.f.	-	\$ -
	Structured Cabling	good	Dmark on 1st floor. Trunk lines to 3rd floor via 2nd floor telecom room and sleeves.	None	-	s.f.	-	\$ -
	Data Network	good	Cat 5e	None	-	l.s.	-	\$ -
	Wireless Network	good	Throughout suite except dispatch.	None	-	EA	-	\$ -
	Voice System	good	Separate phone system.	None	-	EA	-	\$ -
	AV				-	s.f.	-	\$ -
	Sound Systems	good	Separate phone system with speakers throughout space and parking lot.	None	-	l.s.	-	\$ -
Fire Protection	Sprinkler System	good	The building is equipped throughout with a sprinkler system. The RiverCom operation area has a pre-action system with an abort button. Notification of pre-action release is not apparent in space, only at control panel. A separate "agent release" devise is present next to abort button but function is unknown.	Provide pre-action notification, particularly at the abort button, with instructional signage. Determine function of "agent release" devise and provide instruction.	1	l.s.	5,000.00	\$ 5,000
Environmental Remediation	-	good		None	-	s.f.	-	\$ -
Architectural Area	6940 SF				-	s.f.	-	\$ -
Exterior								
	circulation	fair	access to facility is not easily identifiable and does not have a security lobby	impacted by parking configuration and entry sequence	-	l.s.	-	\$ -
	sidewalk/paving	good	concrete	none	-	l.s.	-	\$ -
	roof	good	assumed membrane	none	-	s.f.	-	\$ -
	walls	good	metal panel, CMU, concrete	none	-	s.f.	-	\$ -
	windows/curtainwall	good	aluminum	none	-	s.f.	-	\$ -
	doors/storefronts	good	aluminum	none	-	pr.	-	\$ -
	Plumbing				-	EA	-	\$ -
	ADA	fair	site access to PD entry, limited at 911 center	study parking and if additional work is done to provide better access	-	ea.	-	\$ -

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
Interior Spaces								
Lobby/ Reception								
	floors	fair	carpet	track wear and replace as needed	500	s.f.	5.00	\$ 2,500
	walls	poor	GWB	extend GWB full height adjacent to lobby for security reasons	1	l.s.	5,000.00	\$ 5,000
	ceilings	good	2'x4' act	None	-	s.f.	-	\$ -
	casework	good	manufactured plam casework & work stations	None	-	l.f.	-	\$ -
	HVAC	good	Area is served by a zone of the building VAV system.	None	-	s.f.	-	\$ -
	Lighting	good	Recessed compact fluorescent downlights. Emergency battery backup ballasts in egress fixtures.	Replace with LED fixtures for energy efficiency and maintenance	105	s.f.	7.50	\$ 788
	Electrical	good	Receptacles located appropriately	None	-	s.f.	-	\$ -
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing		n/a		-	l.s.	-	\$ -
	ADA	good		None	-	ea.	-	\$ -
	Other	fair	security related issues relative to sightlines into space- did not see a means to observe who is at the door- verify	provide means to observe lobby	-		-	
		poor	wall adjacent to lobby is not floor to underside of roof deck- allows for security breach through ceiling	extend framing and GWB full height	1	l.s.	15,000.00	
		poor	no ballistic glazing from lobby to reception	upgrade glazing or install ballistic rated panels	1	l.s.	10,000.00	

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
<i>Dispatch</i>								
	floors		raised floor with carpet tile	None	-	s.f.	-	\$ -
	walls		GWB	None	-	s.f.	-	\$ -
	ceilings		2'x4' act	None	-	s.f.	-	\$ -
	casework		N/A		-	l.f.	-	\$ -
	AV	fair	Wall mounted screens/monitors are too small- not enough wall space available, sightlines	xxxx	-	s.f.	-	\$ -
	HVAC	good	Area is served by a zone of the building VAV system. Two split-system fan coils provide redundant conditioning. The control and function of the redundant fan coils was not known.	Provide maintenance, repair and training for the fan coils.	2	ea.	4,000.00	\$ 8,000
		xxxx	no underfloor HVAC for individual console controls.	xxxx				
		poor	large swings in temperatures- some dispatchers seen wearing hats and gloves	evaluate HVAC system for potential solutions	-	s.f.	-	\$ -
		fair	noise and odor control issues from open work area	close off area, evaluate HVAC	-	s.f.	-	\$ -
	Lighting	poor	Fluorescent linear pendant fluorescent fixtures with dimming ballasts and incandescent pendant cylinder fixtures at perimeter. Exterior window configuration causes lighting control issues- mesh roller shades don't work well at controlling light. Cylinder fixtures cause glare to occupants and makeshift (paper) light shields have been attached.	Replace with LED indirect fixtures with dimming.	700	s.f.	9.50	\$ 6,650
		poor	lighting and lighting control is not appropriate for the space	Replace controls with automatic/manual dimming per Washington State Energy Code and for functionality.	700	s.f.	2.50	\$ 1,750
	Electrical	xxxx	dedicated power is max'd out- no additional circuits available for additional consoles	Install new transformer and branch circuit panel in Equipment Room 333 for additional capacity and circuit breaker space. (Panel and transformer have been furnished, waiting for installation.)	1	l.s.	7,500.00	\$ 7,500
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing		n/a		-	l.f.	-	\$ -
	ADA		Not assessible around dispatch floor and for daylight control	reconfigure work stations, but limited by number of stations and available square	-	ea.	-	\$ -
	Acoustics		Noise from open adjacent spaces and open circulation plan	dispatch area is primary circulation path, limited options to redefine current circulation based on space constraints	-	ea.	-	\$ -

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
Offices								
	floors	good	carpet	None	-	s.f.	-	\$ -
	walls	good	GWB	None	-	s.f.	-	\$ -
	ceilings	good	2'x4' act	None	-	s.f.	-	\$ -
	HVAC	good	Each office is served by an individual zone of the building VAV system. Capacity or control issue often results in uncomfortable	Building control programming and adjustments.	1	l.s.	10,000.00	\$ 10,000
	Lighting	good	2'x4' 18-cell parabolic fluorescent fixtures with inboard/outboard switching	Replace with LED fixtures for energy efficiency and dimming capability	405	s.f.	7.50	\$ 3,038
	Electrical	good	Receptacles located appropriately	None	-	s.f.	-	\$ -
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing		N/A		-	s.f.	-	\$ -
	ADA	good	clearances are appropriate unless where blocked by storage	move storage and furniture to accommodate accessibility clearances	-	l.s.	-	\$ -
Training/ Conference								
	floors	good	carpet	None, training and conference room are conflicting uses	-	s.f.	-	\$ -
	walls	good	GWB	None	-	s.f.	-	\$ -
	ceilings	good	2'x4' act	None	-	s.f.	-	\$ -
	marker and tack surfaces	good	marker board approx. 4'x8'	None	-	l.f.	-	\$ -
	HVAC	good	The room is an independent zone served by the building VAV system.	None	-	s.f.	-	\$ -
	Lighting	good	Recessed fluorescent fixtures with compact fluorescent downlights at perimeter	Replace with LED fixtures for energy efficiency and dimming capability	180	s.f.	7.50	\$ 1,350
	Electrical	good	Receptacles located appropriately	None	-	s.f.	-	\$ -
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing		N/A		-	s.f.	-	\$ -
	ADA	good	the room is accessible	None	-	ea.	-	\$ -

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
<i>Break Room/ Kitchen</i>								
	floors	fair	vinyl tile	flooring is curling a bit, track wear for future maintenance. Too many activities in space, includes a quite area which should be	300	s.f.	4.00	\$ 1,200
	walls	good	GWB	None	-	s.f.	-	\$ -
	ceilings	good	2'x4' act	None	-	s.f.	-	\$ -
	casework	good	manufactured with plam faces, 3 tiered metal food storage lockers added	None	-	l.f.	-	\$ -
	kitchen equipment	fair	refrig/freezer, microwave	want additional refrig and a cooktop	-	l.f.	-	\$ -
	HVAC	good	The room is an independent zone served by the building VAV system. No exhaust is present which sometimes results in odors.	Provide local exhaust.	1	l.s.	4,000.00	\$ 4,000
	Lighting	good	Recessed compact fluorescent downlights.	Replace with LED fixtures for energy efficiency and maintenance	140	s.f.	7.50	\$ 1,050
	Electrical	good	Minimal receptacle locations	Install additional receptacles for convenience	140	s.f.	6.00	\$ 840
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing	fair	Sink is small for washing dishes. No dishwasher is present.	Provide dishwasher.	1	l.s.	3,000.00	\$ 3,000
	ADA	poor	counter, appliance, and sink areas are not accessible	rework counter, sink, and appliance areas for accessibility or provide reasonable accommodations	1	l.s.	5,000.00	\$ 5,000

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
<i>Work Room</i>								
	<i>floors</i>	<i>good</i>	carpet	None	-	s.f.	-	\$ -
	<i>walls</i>	<i>good</i>	GWB	None	-	s.f.	-	\$ -
	<i>ceilings</i>	<i>good</i>	2'x4' act	None	-	s.f.	-	\$ -
	<i>casework</i>	<i>good</i>	manufactured with plam faces	None	-	l.f.	-	\$ -
		<i>poor</i>	lockers brought in to address lack of storage, island under utilized and not needed	temporary solution but impacts usable space	-	l.f.	-	\$ -
		<i>poor</i>	GIS workstation put in space impacts work area and employees using space	temporary solution but impacts usable space	-	l.f.	-	\$ -
	<i>HVAC</i>	<i>xxxx</i>	The area is an independent zone served by the building VAV system. <i>impacted by smells of adjacent restrooms</i>	<i>evaluate HVAC system for potential solutions</i>	-	s.f.	-	\$ -
	<i>Lighting</i>	<i>good</i>	Linear fluorescent pendant fixtures	Replace with LED fixtures for energy efficiency and maintenance	265	s.f.	7.50	\$ 1,988
	<i>Electrical</i>	<i>good</i>	Receptacles located above counters	None	-	s.f.	-	\$ -
	<i>Fire Alarm</i>	<i>good</i>	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	<i>Plumbing</i>		N/A		-	s.f.	-	\$ -
	<i>ADA</i>		countertops not accessible	provide reasonable accommodation based on	-	s.f.	-	\$ -
	<i>Other</i>		area is open to dispatch room causing odor and noise issues	wall off spaces potentially with glazing	-	l.s.	-	\$ -

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
Corridors								
	floors	fair	carpet	some carpet wear in some areas. use carpet tile for future installations	500	s.f.	5.00	\$ 2,500
	walls	good	GWB	None	-	s.f.	-	\$ -
	ceilings	good	2'x4' act	None	-	s.f.	-	\$ -
	HVAC		N/A		-	s.f.	-	\$ -
	Lighting	good	Recessed compact fluorescent downlights. Emergency battery backup ballasts in egress fixtures.	Replace with LED fixtures for energy efficiency and maintenance	235	s.f.	7.50	\$ 1,763
	Electrical	good	Receptacles located appropriately	None	-	s.f.	-	\$ -
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing		N/A		-	s.f.	-	\$ -
	ADA	fair	generally accessible but areas where space needs have been impacted due to rollies (mobile storage for staggered shifts)	move mobile totes from around door ways to allow for forward approach clearances	-	ea.	-	\$ -
	Security	fair	hallways adjacent to EOC do not have full height walls and cause a security concern in to the facility	extend GWB to underside of roof deck	1	ea.	5,000.00	\$ 5,000
Restrooms								
	floors	good	tile	None	-	s.f.	-	\$ -
	walls	good	tile & GWB	None	-	s.f.	-	\$ -
	ceilings	good	GWB	None	-	s.f.	-	\$ -
	HVAC	poor	Exhaust is not working.	Repair or replace exhaust fan.	1	l.s.	2,500.00	\$ 2,500
	Lighting	good	Recessed fluorescent fixtures with motion sensor switches	Replace with LED fixtures for energy efficiency and maintenance	-	s.f.	-	\$ -
	Electrical	good	Receptacles located appropriately	None	-	s.f.	-	\$ -
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing	good	Separate Men's and Women's restrooms with ADA fixtures.	None	-	fixtures	-	\$ -
	ADA	good	the room is accessible	None	-	l.s.	-	\$ -
	doors/hardware	good	wood with closer	weather seal door, add door bottom- confirm make-up air location	1	l.s.	1,000.00	\$ 1,000
	Stalls	good	metal, overhead braced	None	-	l.s.	-	\$ -

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
Equipment Room								
	floors	good	raised & lightweight concrete	confirm static control	-	s.f.	-	\$ -
	walls	good	GWB	None	-	s.f.	-	\$ -
	ceilings	good	exposed	None	-	s.f.	-	\$ -
	rack, UPS, CRAC				-	l.s.	-	\$ -
	HVAC	good	Space is served by a dedicated Liebert unit with local control and has generator backup power. Redundant cooling is provide by building VAV system, although switchover is not automatic and building system is not on generator power. Capacity is adequate for current and future needs. no ac	Provide true redundant HVAC system with automatic switchover and generator backup power. This may simply not be feasible	1	l.s.	200,000.00	\$ 200,000
	Lighting	good	pendant mounted industrial fluorescent fixtures	None	-	s.f.	-	\$ -
	Electrical	poor	no standalone generator	A separate generator should be added to service the PSAP equipment only with an automatic transfer switch installed to switch between power sources. The fuel tank should be sized for a 72-hour runtime. (Cost is shown under General Comments)	1	l.s.		\$ -
		poor	Generator and switchboard not seismically supported	Provide seismic support	1	l.s.	1,200.00	\$ 1,200
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing		N/A		-	l.f.	-	\$ -
	Fire Protection	n/a	Protected by pre-action sprinkler system.	Provide chemical agent suppression system in lieu of sprinklers.	1	l.s.	60,000.00	\$ 60,000
	ADA	fair	space is generally accessible but work stations are not		-	l.s.	-	\$ -
Mechanical								
	floors	good	concrete	None	-	s.f.	-	\$ -
	walls	good	combination of GWB, CMU	None	-	s.f.	-	\$ -
	ceilings	good	gyp fire taped	None	-	s.f.	-	\$ -
	HVAC		N/A		-	s.f.	-	\$ -
	Lighting	good	pendant mounted industrial fluorescent fixtures	Replace with LED fixtures for energy efficiency and maintenance	530	s.f.	6.00	\$ 3,180
	Electrical	good	Receptacles located appropriately	None	-	s.f.	-	\$ -
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing		N/A		-	s.f.	-	\$ -
	controls				-	s.f.	-	\$ -
	water/gas				-	s.f.	-	\$ -

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
<i>Generator</i>								
	floors	good	concrete	None	-	s.f.	-	\$ -
	walls	good	combination of GWB, concrete	None	-	s.f.	-	\$ -
	ceilings	good	gyp fire taped	None	-	s.f.	-	\$ -
	HVAC				-	s.f.	-	\$ -
	Lighting	good	Stirp fluorescent fixtures	None	-	s.f.	-	\$ -
	Electrical	good	Receptacles located appropriately	None	-	s.f.	-	\$ -
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing				-	s.f.	-	\$ -
	controls				-	s.f.	-	\$ -
	water/gas				-	s.f.	-	\$ -
<i>UPS Room</i>								
	floors	good	concrete	None	-	s.f.	-	\$ -
	walls	poor	gyp board	the room needs fire separation from the munitions room, the door into the room needs to be rated and a fire closer should be added so gas and particulates are isolated from this	1	l.s.	7,500.00	\$ 7,500
	ceilings	good	gyp fire taped	verify if fire dampers needed	-	s.f.	-	\$ -
	HVAC				-	s.f.	-	\$ -
	Lighting	good	Surface mounted wraparound fluorescent	None	-	s.f.	-	\$ -
	Electrical	good	Receptacles located appropriately	None	-	s.f.	-	\$ -
	Fire Alarm	good	Existing building-wide fire alarm system.	None	-	s.f.	-	\$ -
	Plumbing				-	s.f.	-	\$ -
	controls				-	s.f.	-	\$ -
	water/gas				-	s.f.	-	\$ -
<i>General Systems</i>								
	intercom	good	Intercom devices at main lobby door	None	-	s.f.	-	\$ -
	Clock/ Bell System	good	Dedicated clock system for Call Center. NetClock.	None	-	s.f.	-	\$ -
	Security	fair	Shared access control system with police station. Cannot update cards	Install new dedicated access control system	1	l.s.	40,000.00	\$ 40,000
	Optional emergency power	poor	The existing generator is located on the parking garage level (1st floor) and is rated 300 kW/375 kVA at 480Y/277 volts, 3-phase, 4-wire. The fuel tank holds 520 gallons, which would accommodate a 26-hour runtime at full load and a 55-hour runtime at 50% load. (The maximum demand for the previous 30 days was less than 50%.) The generator serves both the police station and call center.	A separate generator should be added to service the PSAP equipment only with an automatic transfer switch installed to switch between power sources. The fuel tank should be sized for a 72-hour runtime. (Cost is shown under General Comments)	1	l.s.		\$ -
	General building upgrades not indicated elsewhere				-	s.f.	-	\$ -

Program Area	Item	Cond (poor, fair, good)	Description	Recommendations	# Units	Unit	Base unit Price	Estimated Costs
			Subtotal					\$ 707,820
			Contingency		20%			\$ 141,564
			Subtotal					\$ 849,384
			Escalation	Assume 1 year @ 5%/year	5%			\$ 42,469
			Total Estimated Costs			s.f.		\$ 891,853

PROGRAMMING STUDY

INTRODUCTION

The SCHRADERGROUP (SG) planning team worked with a team comprised of representatives from RiverCom 9-1-1 in November of 2018 to develop preliminary space programs for a facility representing current standards in the industry. The goal was to determine anticipated future space needs for the proposed RIVERCOM 9-1-1 Facility. The programming effort was conducted with the intent of deciding if the current facility located above Police Headquarters would continue to suffice or whether the group should consider an alternative location.

The overall goal for the facility is to provide emergency services for the residents supported by RiverCom 9-1-1, to include; emergency communications and all support services for those functions. Of interest to RiverCom 9-1-1 was the comparison of the existing building areas supporting the agency functions vs those areas generally required to serve the same function. The planning team attempted to gather the existing building areas from a plan provided to them and included those area comparisons in the programming documents.

Once facility needs were derived and future programs were established, the design team developed the proposed overall building areas required for each of the functions. The results of the programming study are included on the following pages.

The programming information is used as the basis for locating these functions within the concept plans developed later in this document. What follows are all of the building elements anticipated for the proposed facility. The Concept Design Options identified in Section 6 of this document and the Concept Budgets described in Section 7 of this document reflect the building program outlined here.

SPACE STANDARDS

The entire program study uses Space Standards agreed to with the planning team at the meeting in August. The standards utilized are as follows:

<u>PERSONNEL TITLE</u>	<u>STANDARD S.F.</u>
Executive Director Office	200 s.f.
Manager Office	175 s.f.
Private Office	150 s.f.
Manager Workstation	96 s.f.

Supervisor Workstation	64 s.f.
Call Taker/ Dispatcher Workstation	56 s.f.
Conference/Training	20 s.f. per person

The programming worksheet then utilizes a net to gross square footage conversion for each workstation or office type. Typically, our worksheet will show a 50% NSF to GSF conversion for workstation spaces and a 30% NSF to GSF conversion for office spaces. Various other spaces receive other conversion factors. This tallies into a total GSF for each of the parts of the facility and then a total building NSF to GSF allocation of 10% is applied to cover exterior walls and other utility spaces.

PROGRAM SUMMARY

Following the programming workshop, a program document was developed. Ultimately the program document (provided beginning on page 3-4) breaks the facility into 5 major components. Those components are also measured against the area currently assigned for those uses within the existing facility in the worksheets. The gross square footage program for a current communication facility serving a comparable function is as follows:

MAIN BUILDING

Administration	3,204 s.f.
Operations	2,297 s.f.
Training	769 s.f.
Technology	2,302 s.f.
Common Spaces	3,926 s.f.
<hr/>	
Subtotal	12,497 Net Square Feet
Net to Gross Conversion	1,250 s.f.
<hr/>	
TOTAL PROPOSED BUILDING AREA	13,747 Gross Square Feet

As previously noted, the planning team attempted to calculate the existing building area of the police station currently being used by RiverCom 9-1-1. The calculation was developed using direct building areas for the spaces on the floor that are identifiable, coupled with a percentage calculation of building system services (mechanical, electrical etc.) that are shared by the building as a whole (including the conference room downstairs). The direct building areas calculated are approximately 7,785 s.f. of area. It could be assumed that an additional 600 s.f. or so would be required for mechanical and electrical space bringing the subtotal to 8,385 s.f.. Utilizing the same methodology of building gross square footage increase as utilized for the proposed new facility programming, 10% would be added to the total. So, total building area utilized within the police building's footprint could reach

8,385 s.f. + 10% is 9,223 s.f.. So, the appropriate comparison of area currently used by RiverCom 9-1-1 vs. the programmed space would be 9,223 s.f. vs the 13,747 program s.f. or a current approximate shortage of 4,524 s.f.

The complete program is provided beginning on the following page. These building components are used in the concept diagrams and budget exercises developed for Section 6 and 7 of this overall study.

RIVERCOM 9-1-1 - EMERGENCY COMMUNICATIONS

PROGRAM SUMMARY

		EXISTING		PROPOSED					28-Nov-18
		Existing NSF	Existing GSF	NSF	Grossing Factor	GSF	Total		
1.0	ADMINISTRATION	1710	2500	2414	33%	790	3204		
2.0	OPERATIONS	684	1570	1306	60%	991	2297		
3.0	TRAINING	0	0	474	52%	295	769		
4.0	TECHNOLOGY	1500	1995	1322	105%	980	2302		
5.0	COMMON SPACES	1155	1720	3150	24%	776	3926		
Subtotal		5049	7785	8666	55%	3831	12497		
Building GSF @ 10%						1250			
TOTAL BUILDING				8666		5081	13747		

Parking: Provide 35 parking spaces plus RiverCom trucks and trailers

		EXISTING				PROPOSED								Comments
		Existing Area/Unit	Existing # Units	Existing NSF	Existing GSF	Space Code	Proposed Area/ Unit	Proposed # Units	NSF	Grossing Factor		GSF	Total	
1.0	ADMINISTRATION													
1.0	Administration													
1.1	Executive Director	245	1	245		CO	200	1	200	30 %		60	260	
1.2	Administrative Services Manager - Future Financial Manager	235	1	235		CO	175	1	175	30 %		53	228	
1.3	Administrative Services Filing	0	0	0		CO	75	1	75	30 %		23	98	Could be contained within Admin Services Manager Office
1.4	Future HR Manager	0	0	0		CO	175	1	175	30 %		53	228	
1.5	Executive Assistant	120	1	120		CO	150	1	150	30 %		45	195	
1.6	Receptionist	120	1	120		WS	96	1	96	50 %		48	144	
1.7	IT Manager	180	1	180		CO	175	1	175	30 %		53	228	
1.8	IT Asset Storage	0	0	0			50	1	50	25 %		13	63	Managed by IT Manager
1.9	Operations Manager	180	1	180		CO	175	1	175	30 %		53	228	
1.10	Future QA/QI Manager	0	0	0		CO	175	1	175	30 %		53	228	
1.11	Future Public Disclosure Officer	0	0	0		WS	96	1	96	50 %		48	144	
1.12	Public Disclosure Storage	0	0	0			50	1	50	25 %		13	63	
1.13	Future Administrative Support	0	0	0		WS	96	1	96	50 %		48	144	
1.14	Future Administrative/Vendor/Auditor	0	0	0		WS	96	1	96	50 %		48	144	
1.15	Conference	305	1	305			20	14	330	30 %		99	429	Include coffee bar/sink
1.16	Waiting - Reception	30	1	30			15	2	30	30 %		9	39	
1.17	Work/ Copy / File	295	1	295			150	1	150	25 %		38	188	Shared with Operations
1.18	Administrative Filing Storage	0	0	0			50	1	50	25 %		13	63	
1.19	Toilet	0	0	0			70	1	70	35 %		25	95	
			9	1710	2500		Subtotal	14	2414	33 %		790	3204	
2.0	OPERATIONS													
2.1	Comm Center Admin													
2.1.1	Supervisor Office	60	3	180		SO	64	2	128	50 %		64	192	File Cabinets for three Supervisors. With printer
2.1.2	Supervisor Office	0	0	0		SO	64	2	128	50 %		64	192	File Cabinets for three Supervisors. With printer
			3	180	250		Subtotal		256	50 %		128	384	
2.2	Communications Center													
2.2.1	Supervisor Workstations	36	3	108		WS	64	2	128	100 %		128	256	Raised Platform
2.2.2	Call Takers/ Dispatchers	36	11	396		WS	56	9	504	100 %		504	1008	8' x 6' - 10" workstations
2.2.3	Empty-Future Call Taker/Dispatcher/Surge Workstation	0	0	0		WS	56	3	168	100 %		168	336	
2.2.4	Printer/ Scanner/Copy Stations	0	0	0			50	2	100	25 %		25	125	
2.2.5	Storage/Supplies	0	0	0			150	1	150	25 %		38	188	
			14	504	1320		Subtotal		1050	70 %		863	1913	
			17	684	1570		SUBTOTAL COMM CENTER		1306	60 %		991	2297	

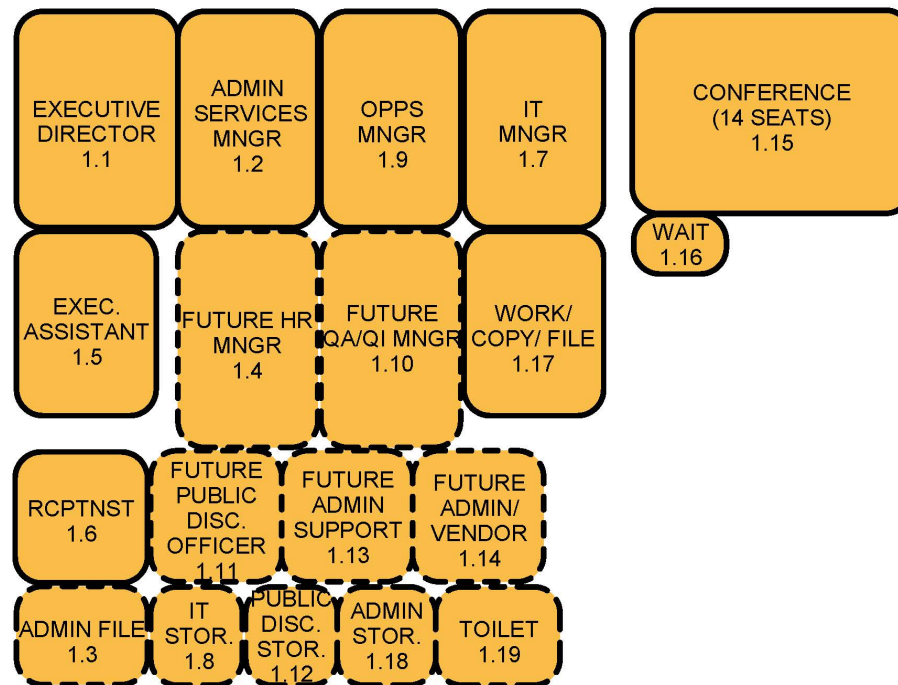
		EXISTING				PROPOSED									
		Existing Area/Unit	Existing # Units	Existing NSF	Existing GSF	Space Code	Proposed Area/ Unit	Proposed # Units	NSF	Grossing Factor		GSF	Total	Comments	
3.0	TRAINING														
3.0	Training														
3.1	Console Training	0	0	0			56	4	224	100 %		224	448		
3.2	Training Manager Office	0	0	0		CO	175	1	175	30 %		53	228	With Records	
3.3	Secure Files/ Training Records/Storage	0	0	0			75	1	75	25 %		19	94	Could be combined with Training Office	
			0	0	0			Subtotal	474	52 %		295	769		
4.0	TECHNOLOGY														
4.1	Technology Office														
4.1.1	Radio Manager	90	1	90		CO	175	1	175	30 %		53	228	Workbench	
4.1.2	GIS Analyst	145	1	145		CO	150	1	150	30 %		45	195	Plotter and layout	
4.1.3	Information System Technician	120	1	120		CO	125	1	125	30 %		38	163	Work Area	
4.1.4	Radio Technician	85	1	85		SO	175	1	175	50 %		88	263	Workbench	
4.1.5	Future Radio Technician	0	0	0		SO	100	1	100	50 %		50	150		
4.1.6	Future Programmer	0	0	0		CO	125	1	125	30 %		38	163		
4.1.7	Technology Secure Storage	135	1	135			120	1	120	25 %		30	150		
			5	575	800			Subtotal	970	35 %		340	1310		
4.2	Equip Rooms														
4.2.1	Communications Rack Systems	100	9	900			8	21	168	250 %		420	588		
4.2.2	Future Racks/ Switchout	0	0	0			8	3	24	250 %		60	84		
4.2.3	CRAC Units	25	1	25			32	2	64	100 %		64	128		
4.2.4	UPS	0	0	0			48	2	96	100 %		96	192		
4.2.5	Work Bench	0	0	0		WS	96	1	96	50 %		48	144		
			10	925	1195			Subtotal	352	175 %		640	992		
			15	1500	1995			SUBTOTAL TECHNOLOGY	1322	105 %		980	2302		

		EXISTING				PROPOSED								
		Existing Area/Unit	Existing # Units	Existing NSF	Existing GSF	Space Code	Proposed Area/ Unit	Proposed # Units	NSF	Grossing Factor		GSF	Total	Comments
5.0	COMMON SPACES													
5.1	Front of house													
5.1.1	Secure Vestibule	0	0	0			100	1	100	30 %		30	130	
5.1.2	Lobby/ Waiting	0	0	0			100	1	100	30 %		30	130	
5.1.3	Conference	650	1	650			20	30	650	30 %		195	845	
5.1.4	Toilet Room	0	0	0			70	1	70	35 %		25	95	
			1	650	925		Subtotal			920	31 %	280	1200	
5.2	Back of house - Personnel Support													
5.2.1	Kitchen	220	1	220			120	1	120	30 %		36	156	Two refrig, stove
5.2.2	Dining	0	0	0			100	1	100	30 %		30	130	
5.2.3	Lockers	25	1	25			2.5	40	100	30 %		30	130	With integral mailboxes
5.2.4	Quiet Room	0	0	0			80	1	80	30 %		24	104	
5.2.5	Toilet Rooms	130	2	260			70	4	280	35 %		98	378	
5.2.6	Toilet Rooms with Showers	0	0	0			100	2	200	35 %		70	270	
5.2.7	Lactation Room	0	0	0			80	1	80	30 %		24	104	With counter, sink and refrig
5.2.8	Fitness Room	0	0	0			250	1	250	30 %		75	325	
5.2.9	Storage	0	0	0			50	1	50	25 %		13	63	
			4	505	795		Subtotal			1260	31 %	400	1660	
5.3	Back of house - Building Systems													
5.3.1	Main Power Distribution	0	0	0			100	1	100	10 %		10	110	
5.3.2	Secondary Electrical Rooms	0	0	0			200	1	200	10 %		20	220	
5.3.3	Emergency Generator	0	0	0			0	0	0	10 %		0	0	
5.3.4	Mechanical/Plumbing Room/ Fire protection	0	0	0			400	1	400	10 %		40	440	
5.3.5	Maintenance/Custodial Stor./ Work	0	0	0			120	1	120	10 %		12	132	
5.3.6	Janitorial Spaces	0	0	0			50	1	50	10 %		5	55	
5.3.7	Building Storage - Water, MREs etc.	0	0	0			100	1	100	10 %		10	110	
			0	0	0 approx		Subtotal			970	10 %	97	1067	
			5	1155	1720		SUBTOTAL COMMONS			3150	24 %	776	3926	

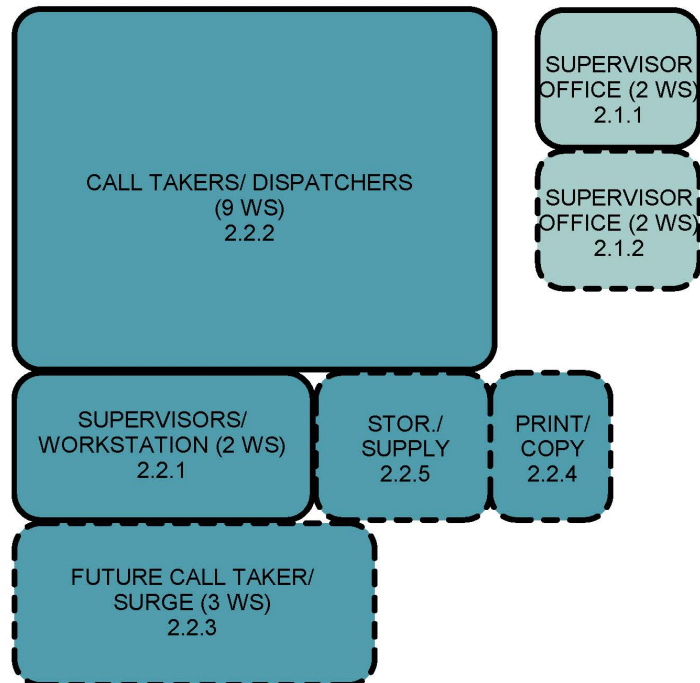
PROGRAM SPACES

The team has created program spaces bubbles from the areas identified in the Program Worksheet provided on the prior pages. The program space bubbles demonstrate the relative size of the various program elements related to others. Further, the diagrams define the areas that are currently included in the existing building (with solid lines surrounding the areas) vs. the new areas not currently provided in the facility (using dashed lines around the areas). These program areas are used in Section 6 to develop the building floor plans.

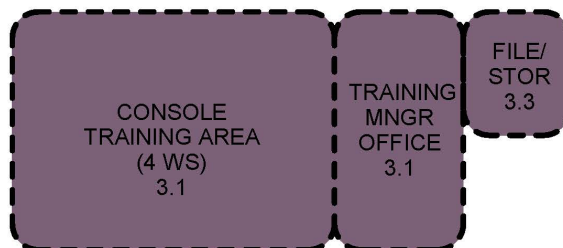
ADMINISTRATION



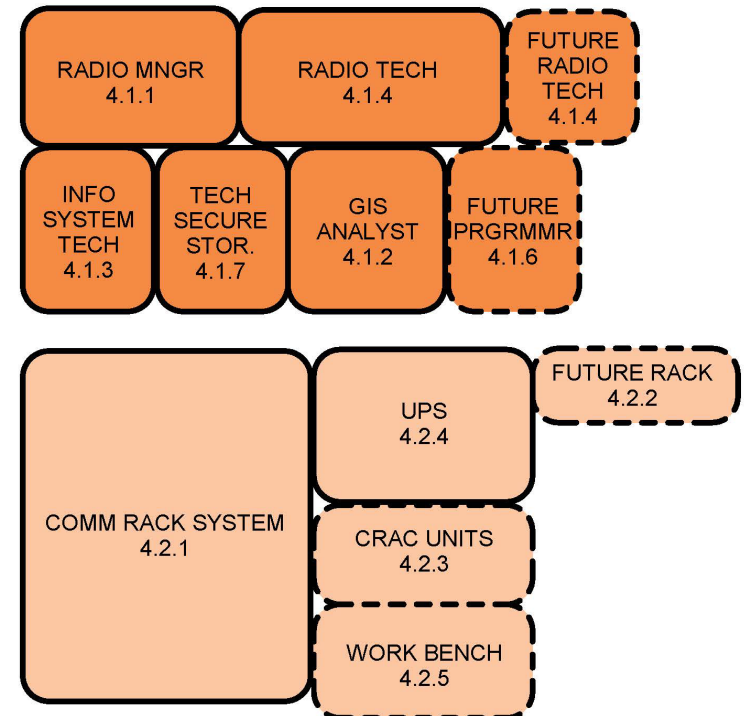
OPERATIONS



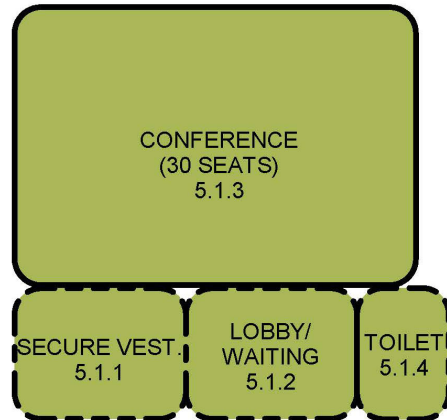
TRAINING



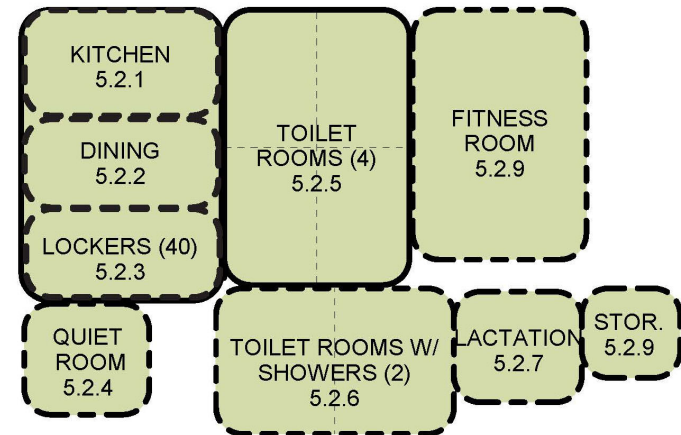
TECHNOLOGY



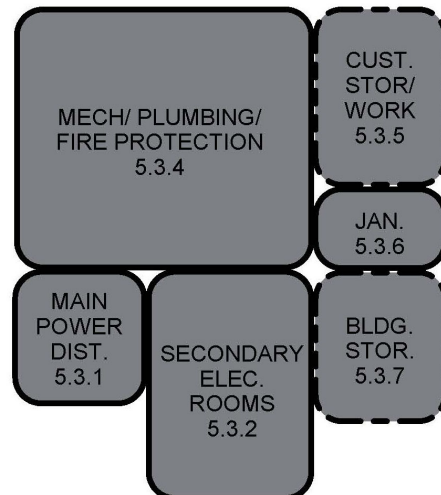
COMMON SPACES - FRONT OF HOUSE



COMMON SPACES - BACK OF HOUSE



COMMON SPACES - SYSTEMS



THREAT ASSESSMENT

INTRODUCTION

This section includes a Threat Assessment developed for the existing site and building analyzed for this Study. The team decided that without a new “greenfield” site to analyze, that the analysis would be performed for the existing facility located in the Police Department building. The Threat Assessment is performed in general conformance with FEMA 452 Risk Assessment criteria. Topics similar to those identified in the FEMA document are addressed however they are addressed in a format more specific to this site and this specific use.

This assessment was performed in two phases. The RiverCom 9-1-1 team was engaged in an analysis of the risks during the workshop activities in November. The design team then took those risks and concerns and developed the mitigation strategies specific to the existing building.

What follows is an assessment for the proposed site. The design team has taken the Threat Assessments plus the requirements that we believe are applicable to a mission critical facility in this region and have modified the assessment to reflect those issues. The document assigns a probability of a risk (as determined by the design team members and members of RiverCom 9-1-1 staff) for this site, and then provides an assessment of the importance of that occurrence to the operations of the facility. Following that, mitigation strategies are provided for the design of the facility. The results create the basis for architecture and engineering considerations provided in Section 5.

To some extent, the majority of threats to the proposed site for this project are natural forces or weather-related incidents. There is always some concern for continuity of operations issues generated by manmade threats, however weather threats dominate the concern. This threat assessment recognizes those concerns and attempts to provide mitigating strategies to counteract them.

Actual remediation efforts for any of the perceived threats are included on the following pages and in Section 5 to follow.

Threat and Vulnerability Assessment		ASSESSMENT		DESIGN RECOMMENDATIONS ARE NOTED FOR THE FOLLOWING BUILDING SYSTEMS					
Completion Date:	11/29/2018	Rank (high, medium, low)							
		Probability of Occurrence	Importance of Occurrence	Vulnerability	Architectural Solutions	HVAC/Plumb/ Fire Protect Redundancy	Electrical Redundancy	Telecomm Redundancy	Other
NATURAL THREATS									
	Weather								
	Flood	Low	High	Building is in the inundation zone for upstream dams. Access issues and evacuation issues.			Main electrical service switchboard, generator and UPS batteries are located on the first floor/parking level and would not be operational in a flood condition.	Telecommunication services enter the building on the 1st floor in TeleComm Room 123 and would not be operational in a flood condition.	
	Flash Flood	High	High	Transformer vault floods. Power outages are an issue.	There is little to be done at the existing facility.	There is little to be done at the existing facility.	PUD transformer is pad-mounted and is located at the SW corner of the building across the alley. Owner stated that the utility power is lost during flash floods. The PUD transformer should be replaced with one rated for below-ground use to avoid issue, mounted in a below-grade vault.	Telecommunication services enter the building on the 1st floor in TeleComm Room 123. Owner did not mention risk of losing systems during flash flood.	
	Snow/Ice	High	Medium	Less effect on facility. Access is an issue. Roof loads should be evaluated.	Roof designed for 40 PSF live load. Should be sufficient.	Tall roof curbs. Stands for ground mounted equipment.	The existing generator is located on the parking garage level (1st floor) and is rated 300 kW/375 kVA at 480Y/277 volts, 3-phase, 4-wire. The fuel tank holds 520 gallons, which would accommodate a 26-hour runtime at full load and a 55-hour runtime at 50% load. (The maximum demand for the previous 30 days was less than 50%.) The generator serves both the police station and call center. A separate generator should be added to service the PSAP equipment only with an automatic transfer switch installed to switch between power sources. The fuel tank should be sized for a 72-hour runtime.	Record drawings indicate that two separate incoming pathways are available for telecommunications. Both fiber and microwave are present.	Fuel tank size was considered based on service to the site. Look at 72 hour for FEMA requirements
	Hail	Medium	Low	Roof structure transmits noise. Affects calls	Add acoustical panels to the ceiling system	Hail guards for exterior mounted equipment.			
	Hurricane/ Tropical Storm in this location	No	No						

		Probability of Occurrence	Importance of Occurrence	Vulnerability	Architectural Solutions	HVAC/Plumb/ Fire Protect Redundancy	Electrical Redundancy	Telecomm Redundancy	Other
NATURAL THREATS (cont.)									
	<i>Weather (cont.)</i>								
	High wind risk (haboobs)	Low	Medium	Power distribution is affected. Roofs have been removed in the city. Projectile concern. Windows do not appear to have resilience	Consider upgrades to exterior wall and window systems. Also discuss daylighting. Look at filling in existing skylights.	Consider rooftop units with special anchorage and screen wall capable of missile projectiles.	The existing generator is located on the parking garage level (1st floor) and is rated 300 kW/375 kVA at 480Y/277 volts, 3-phase, 4-wire. The fuel tank holds 520 gallons, which would accommodate a 26-hour runtime at full load and a 55-hour runtime at 50% load. (The maximum demand for the previous 30 days was less than 50%.) The generator serves both the police station and call center. A separate generator should be added to service the PSAP equipment only with an automatic transfer switch installed to switch between power sources. The fuel tank should be sized for a 72-hour runtime.	Record drawings indicate that two separate incoming pathways are available for telecommunications. Both fiber and microwave are present.	
	Lightning	High	High	Power distribution is affected. Systems are not grounded properly. The building does have lightning protection.			Full lightning and grounding system present on building and connected to ground bus at main switchboard.	UPS system, cable trays and access floor are grounded to ground bus at main switchboard. Grounding to server racks and dispatch workstations should be modified to meet R56 standards.	
	Wildfires	High	High	Embers and smoke. Relight through embers. Air quality. 9-1-1 relocation several years ago was closer to the fire. 5 of 10 high vulnerability locations for fire are in this county. Wenatchee is number 5.		Outside air intake shutdown to be considered			
	<i>Seismic/Geological</i>								
	Earthquake	Low	High	Local fault has been identified. Not designed for seismic. Seismic restraint and flexibility not incorporated.	Consider future upgrade of seismic restraints on architectural elements	Seismic anchoring of equipment. Bracing of ductwork and piping.	Seismic restraints should be added to switchboard and generator. Seismic support should be added to lighting in dispatch area.	Server racks should be replaced with seismic-rated.	
	Mud/ Rock Slide	No	Low						
	Radon	Low	Low						
	Subsidence	Low	Low						

		Probability of Occurrence	Importance of Occurrence	Vulnerability Precautions	Architectural Solutions	HVAC/Plumb/ Fire Protect Redundancy	Electrical Redundancy	Telecomm Redundancy	Other
	<i>Service Interruption (Natural Occurrences)</i>								
	Interruption of Primary Power Supply (natural)	Low	High				The existing generator is located on the parking garage level (1st floor) and is rated 300 kW/375 kVA at 480Y/277 volts, 3-phase, 4-wire. The fuel tank holds 520 gallons, which would accommodate a 26-hour runtime at full load and a 55-hour runtime at 50% load. (The maximum demand for the previous 30 days was less than 50%.) The generator serves both the police station and call center. A separate generator should be added to service the PSAP equipment only with an automatic transfer switch installed to switch between power sources. The fuel tank should be sized for a 72-hour runtime.	Record drawings indicate that two separate incoming pathways are available for telecommunications. Both fiber and microwave are present.	
	Interruption of Secondary Power Supply (natural)	Low	High				A second generator should be installed - see above.		
	Interruption of Water (natural)	Low	Low			On-site reserve water tank.			
	Interruption of Telecomm/ Wireless (natural)	Low	High					Record drawings indicate that two separate incoming pathways are available for telecommunications. Both fiber and microwave are present.	
	Interruption of Food Supply (natural)	Low	Low						
	Interruption of Transport (natural)	Low	Low						
CIVIL THREATS									
	<i>Terrorism</i>								
	Chemical	Low	Low			Outside air intake shutdown. Closure of all exterior mechanical openings.			
	Biological	Low	Low			Outside air intake shutdown. Closure of all exterior mechanical openings.			
	Incendiary (explosives)	Low	High	Ammunition storage adjacent to UPS. Have had evacuation notices.	Standoff on the site could be created in the parking area. Could consider bollards etc..		Relocate ammunition storage away from UPS battery location.		
	Firearms	High	High	Building is missing a true secure vestibule scenario. All access points are at the exterior. Glass connections in the corridors. Connectivity with the police station is a vulnerability.	Masonry walls. Consider ballistic or films for the dispatch floor. Concern about visual range form adjacent buildings.				
	Vehicle	Low	High	No true standoff. Unintentional accidents against the building.	Standoff on the site could be created in the parking area. Could consider bollards etc..				
	Aircraft	Low	Low	Not protecting the building from aircraft					
	Radiological	Low	Low						

	Probability of Occurrence	Importance of Occurrence	Vulnerability Precautions	Architectural Solutions	HVAC/Plumb/ Fire Protect Redundancy	Electrical Redundancy	Telecomm Redundancy	Other
CIVIL THREATS (cont.)								
<i>Terrorism (continued)</i>								
Interruption of Power (malicious)	Low	High	PUD protects substations. Infrastructure is protected. On site transformer is pad-mounted.	Create standoff from any electrical equipment (where possible)		Replace pad-mounted transformer with below-grade.	Record drawings indicate that two separate incoming pathways are available for telecommunications. Both fiber and microwave are present.	
Interruption of Fuels (malicious)	Low	High	Heat for building is natural gas.		Consider 72 hour fuel supply	Provide additional generator with fuel storage for 72 hours of runtime.		
Interruption of Water (malicious)	Low	Low			On-site reserve water tank.			
Interruption of Telecomm/ Wireless (malicious)	Low	High	Local concern about autodialer spam				Record drawings indicate that two separate incoming pathways are available for telecommunications. Both fiber and microwave are present.	
Interruption of Food Supply (malicious)	Low	Low						
Unauthorized entry - forced	Low	High	Minimal barriers between public and the 9-1-1 space. Also, no true monitored secure vestibule	Secure vestibule				CCTV and access control systems present. Replace card access system with dedicated system to call center.
Unauthorized entry - visual access	High	High	Visual access directly to the 9-1-1 floor directly through the windows. CJIS concerns, also laser pointing, non ballistic glazing					
<i>Vandalism</i>								
Property Damage	Low	Low	Have had vandalism.					
Theft	Low	Low						
Unauthorized Entry (physical)	High	High	HVAC in the summer forces doors open. Doors don't latch. Combined parking is an issue	Secure vestibule. Address exterior door and window systems discussed in programming session	Correct building pressure control at entry.			CCTV and access control systems present. Replace card access system with dedicated system to call center.
Unauthorized Entry (electronic)	High	High	Direct visual access from apartment building					
<i>Information Security</i>								
Acoustical and Visual Interception of Data	High	High	Direct visual access from apartment building is an issue					
ACCIDENT HAZARDS								
<i>Internal</i>								
Chemical Release	Low	High			Direct exhaust of mechanical and janitorial spaces.			
Fire	Low	High			Building wet sprinkler system with pre-action control in Dispatch/EOC and chemical agent system for Data room.			Fire alarm system existing in facility.
Water	Low	High	Roof concerns		Floor drains in potential wet areas, restrooms, janitor closet, mechanical room, etc.			

		Probability of Occurrence	Importance of Occurrence	Vulnerability Precautions	Architectural Solutions	HVAC/Plumb/ Fire Protect Redundancy	Electrical Redundancy	Telecomm Redundancy	Other
PERSONAL THREATS	External (vicinity of facility)								
	Chemical Release	Low	High	The roadway is a major thoroughfare.		Outside air intake shutdown.			
	Wildfires	High	High			Outside air intake shutdown.			
	Radiological	Low	Low						
	Buried ordinance	Low	Low						
	Aircraft Crash	Low	Low						
	Personal Safety								
	Indoor	High	High	HVAC in the summer forces doors open. Doors don't latch. The adjacency to the police station is a vulnerability. No specific access control for RiverCom. Card access system is old and can't be replaced.	Secure vestibule. Address exterior door and window systems discussed in programming session	Good indoor air quality with high level filtration.			Replace card access system with dedicated system to call center.
	Outdoor on-site and near site	High	High	Police station adjacency is a vulnerability. Concern about police protests outside of the building. Combined parking with Police is an issue. No fenced parking for staff is a vulnerability. One entry which allows for inappropriate persons accessing the facility.	Standoff on the site could be created in the parking area. Could consider bollards etc..				
	ADA Egress	High	High	No point of refuge in stairways. Difficult egress points during fire.					

PROPOSED BUILDING SYSTEMS NARRATIVE

OVERVIEW

This Programming and Planning Study has been prepared to assess the current and future needs of the RiverCom facility and make recommendations whether to modify the existing facility or relocate to a different facility. The facility is located on the top floor of the Wenatchee Police Department building and houses administrative offices for the organization, and contains the communications center, and all support functions. These facilities typically utilize hardened, redundant and survivable construction and systems.

The facility is required to satisfy the International Building Code (IBC) and the Revised code of Washington State (RCW) based on the time of its construction in addition to meeting all associated ancillary Codes. Beyond those requirements, there are a separate set of criteria and recommendations which are considered when evaluating existing building systems. The first criteria indicated under the IBC, is that the facility will be required to satisfy Essential Facility requirements of the code which increases the seismic criteria and wind loading. Second, however, are a series of additional recommendations and best practices that come into play to help develop the ultimate systems which should optimally be utilized in these types of facilities.

The balance of this section identifies specific criteria that should be utilized when considering the facility's ability to support the community and staff to serve as a Regional communications Center.

GENERAL PSAP (Mission Critical Facility) DESIGN GUIDELINES

This facility must continue operations even under the most adverse conditions (i.e.: last operational building). To accomplish this, the PSAP must incorporate site features, architectural features, and structural design that will allow the facility to maintain its physical integrity under extreme conditions. The building must also be designed to include sufficient redundancy to ensure continuity of operations in case of equipment failure or during maintenance periods. Backup power must be scaled to provide sufficient power for mission critical spaces and equipment for extended periods of time.

Recommended Design Criteria

Aside from referencing the DoD UFC requirements, the Building will be designed in accordance with several standards related to the design of critical infrastructure including the following:

- The most recent local and State Building Code
- National Fire Protection Agency (NFPA) 1221 –Standard for Installation, Maintenance, and Use of Emergency Services Communications Systems.
- National Fire Protection Agency (NFPA) 1660, NAC 783
- Federal Emergency Management Agency (FEMA) 361- Design and Construction Guidance for Community Shelters
- FEMA 452 –A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings.
- Unified Facilities Criteria (UFC) 4-010-01- Department of Defense (DoD) Minimum Antiterrorism Standards for Buildings
- Unified Facilities Criteria (UFC) 4-141-04- Department of Defense (DoD) Emergency Operations Center Planning and Design
- National Institute for Occupational Safety and Health (NIOSH) – Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks
- TIA 942 Telecommunications Infrastructure Standards for Data Centers
- NENA 04-502 E9-1-1 PSAP/ EOC CPE Site Characteristics Technical Information Document
- NENA Generic E9-1-1 Requirements Technical Information Document

Critical Infrastructure Associated with the Facility

Several components of this existing facility are considered as part of the critical infrastructure and include the following:

- Emergency Communications Center
- Computer Equipment Space and Common Spaces

Best Practice Recommendations for Mitigating Risk

While the DoD UFC has specific elements of design prescribed for this facility-type, we often find it advisable to delineate general design concepts. Those elements of design important to a facility of this type are encapsulated below.

- A. Site Perimeter and Access Points
 - a. Perimeter fencing should be provided and would be considered the controlled perimeter per UFC in order to implement UFC standoff requirements.
 - b. Provide ability to reject unauthorized vehicles in secure parking areas.
 - c. Provide clearly defined employee vehicle access with a second means of egress.
- B. Site Layout
 - a. Recommended standoff of 82 feet (25 meters) to parking areas and drive lanes
 - b. If standoff is less than 82 feet, provide enhanced structure, enhanced perimeter, exterior windows, etc. per UFC 4-010-01.
 - c. Locate primary loading/receiving area outside secure parking area.
 - d. Provide vehicle barrier between the parking and building to inhibit vehicle access.
 - e. Locate critical utilities 50 feet away from high-risk areas such as loading / receiving area
 - f. Do not locate areas of concealment such as trash containers and ash cans within 30 feet of buildings.
 - g. Provide electronic access control to secured areas.
 - h. Provide sufficient light levels around buildings and in parking areas, 4-foot candles (fc) in parking areas
- C. Building Layout
 - a. Create multiple security levels within the facility.
 - b. Provide vestibules / airlocks at public and staff entrances.
 - c. Control the public entry / lobby.
 - d. Provide a dedicated employee entry point if possible.
 - e. Secure service access point.
 - f. Limit glass at and around emergency egress routes to prevent visual access into secure spaces and opportunities for intrusion.
 - g. Avoid building shapes with reentrant corners to limit hiding areas.
 - h. Provide electronic access control to secure areas of the building.
- D. Building Envelope
 - a. Use conventional construction if building is located 82 feet away from public parking areas and is less than three stories in height.

- b. Design building envelope to withstand 4 psi – 28psi per millisecond dynamic load if standoff is within 50 to 82 feet from public parking areas pending design described above.
- c. Design building envelope to a specific threat if standoff is less than 50 feet.
- d. Exterior doors should open outward.
- e. Provide windows as recommended by UFC 4-010-01 if 82 foot standoff is not guaranteed.
- f. Windows shall be designed to comply with FEMA 361.
- g. Windows around the Backup PSAP may comply with NFPA 1221 for ballistic protection.

E. Building Structure

- a. Use non-combustible materials per the International Building Code.
- b. Minimize column spacing where acceptable to provide for reduction of the chance of progressive collapse
- c. Provide vertical continuity of columns (avoid using transfer girders)
- d. Design connections to the capacity of the element for standoff less than 82 feet
- e. Design elements for blast if the standoff is less than 50 feet.

F. HVAC / Fire Protection

- a. Place outdoor air intakes high on side walls, on the roof, or in high soffits per NIOSH guidelines.
- b. Provide emergency shut-off for outdoor air intake and monitoring system.
- c. Provide separate exhaust system for public lobby, mail room??, and loading area.
- d. Provide redundant / independent HVAC system for emergency communications per NFPA 1221.

G. Electrical / Telecom

- a. Provide underground utilities encased in duct bank.
- b. Provide emergency generators for all functions and uninterruptible power supply (UPS) for critical infrastructure.
- c. Provide CCTV surveillance around the building perimeter and in parking areas.

H. Other

- a. Provide security desk with visitor screening. Provide ballistic glazing and wall construction around security desk for a controlled entry point.
- b. Provide mail/package room.
- c. Provide the potential future installation of security screening areas

Architectural Considerations

In addition to the above stated requirements for the various components of security and vulnerability a variety of requirements also serve as good guidelines for architectural design of a PSAP facility.

Zoned or layered levels of protection

Facilities of this type should be designed utilizing intensifying areas of security and hardening starting at the site perimeter and moving to the interior of the building.

Passive vs. Active Security Design

While it is critical to include appropriate electronic monitoring and security measures, good architectural techniques should be utilized to provide a facility that creates appropriate levels of hardening and anti-vulnerability through its design. Careful consideration should be given to this approach architecturally. A multi-disciplinary design approach should be utilized to create a facility that utilizes all of its systems to deter intruders.

Capability of increasing or decreasing security

A facility such as this should have the ability to vary its security levels in response to various levels of heightening threat.

General Site recommendations

Buffer Zones	Provide adequate exterior buffer zones around the hardened portion of the site to prevent vehicular intrusion in proximity to the facility. Sufficient setback must be available on the site to accommodate this specific need. In addition, the site should allow appropriate buffering from adjacent sites and where available, sites of high risk adjacent to a potential chosen site should be avoided. Currently the facility lacks both buffering as well as facility hardening.
Landscaping	Given the location of the facility and its location on a street corner, appropriate setbacks from the facility will be difficult to accommodate through landscaping of the site. Traditional solutions include berming, street furniture, podium design of public spaces, large diameter deciduous trees, ponds, trenches, fences, water basins, sculpture and bollards among others would be a challenge to incorporate.
Perimeter protections	The site perimeter is the first step in the provision of the vulnerability zones of protection. Appropriate vehicle speeds should be considered dependent upon the level

of anti-vulnerability desired for a project of this type. In addition, site circulation should be designed to prevent high-speed approaches by vehicles. The vulnerabilities of the current building location relative to protecting the perimeter is exacerbated given its urban setting on a street corner and potential high-speed impact.

Site Signage

Appropriate site circulation signage should be provided to assist visitors in finding their way to eliminate accidental entry into forbidden areas. In addition, elimination of signage in sensitive areas should be considered to discourage entry. The entry is discrete and somewhat confusing given the prominence of the adjacent police entry.

Architectural space considerations

Office Locations

Offices of vulnerable officials may be placed or glazed so that the occupant cannot be seen from an uncontrolled area. Either a location with visual access into a secure area or courtyard should be considered or suitable obscuration of glazing, window treatment, ballistic resistant glazing or other protective devices should be provided. The dispatch area has direct and unmitigated sightlines to the exterior and adjacent buildings which creates both risk as well as lighting control and heat gain issues.

Mixed occupancies

Public areas should be separated from high risk areas (i.e. PSAP or EOC floor area) utilizing appropriate anti-vulnerability measures. In addition, no public toilets or service-oriented spaces should be located in non-secure areas.

Loading docks

Any shipping or receiving area should be given special attention. These areas should be separated from utility rooms, utility mains, service entries (including electrical, telephone, data, fire protection, alarm systems, fire suppression, cooling and heating mains etc.) by a minimum of 50 feet. Loading docks and service access should be located so that no vehicles will be driven into or parked under the facility.

Other items

The following items must be located remotely from the main entrance, vehicle circulation, parking and maintenance areas. If this cannot be accommodated, harden the spaces as necessary:

- Emergency generator, fuel systems, day tank, fire sprinkler and water supply
- Normal fuel storage
- Main switchgear
- Telephone distribution and main switchgear

- Fire pumps
- Building control centers
- UPS systems controlling critical functions
- Main refrigeration systems critical to building operation
- Shafts for utilities
- Critical distribution feeders for emergency power

Concealment Areas Avoid installing features such as trash receptacles and mailboxes that can be used to hide devices.

Exterior walls The description provided here is specific to a building where it is determined blast design must be applied. Again, the owner and designer must contemplate the potential situation mitigation described throughout this section to determine if blast design is needed or not.

Other Architectural and Structural Considerations

The design of the facility should conform to the following, except where local codes or regulations override:

- NFPA Standards, as applicable – NFPA 1221
- State-wide Building Code and all other applicable Building Code
- Applicable Structural Specialty Code
- Applicable Fire and Life Safety Regulations
- Applicable Police/Public Safety Guidelines or Standards, if any
- International Plumbing Code, latest edition
- International Mechanical Code, latest edition
- **National** Electrical Code, latest edition
- Americans with Disabilities Act
- American Society of Heating, Refrigeration and Air Conditioning (ASHRAE) Handbooks
- American Society of Sanitary Engineering (ASSE) Standards
- American National Standards Institute (ANSI) Standards
- American Water Works Association (AWWA) Standards
- American Society for Testing and Materials (ASTM) Standards
- American Society of Mechanical Engineers (ASME) Standards
- Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Standards
- Plumbing and Drainage Institute (PDI) Standards
- Environmental Protection Agency (EPA) Regulations

- Hydronics Institute (HI) Standards
- Air Moving and Conditioning Association (AMCA) Standards
- Air Conditioning and Refrigeration Institute (ARI) Standards
- Illuminating Engineering Society (IES) Handbooks and Recommendations
- Owners Insurance Underwriter Requirements

Expansion

When assessing the condition of the RiverCom facility it should have the ability to accommodate any planned or reasonably anticipated future expansion of either the building itself or the number of stations in the PSAP and associated equipment in the Server Room. While aesthetically the current facility is in good condition, the existing available space is stressed beyond capacity without any consideration of future growth needs. While there may be the ability to expand the facility's footprint, this would be at the expense of other programmatic needs currently occupied by the Police Department which would be challenging. The current equipment room floor allows for expansion of equipment and migration of systems within racks.

Ergonomics

Some of the ergonomic issues include:

- Individual controls of lighting and HVAC at the consoles
- Windows and natural light where appropriate and possible
- Neutral color schemes throughout
- Possibility of variable height consoles
- Wrist pads at the keyboards
- Foot rests
- Break room sizing and multi-use nature
- Comfortable and durable chairs
- Indirect lighting
- Flat screen low gloss monitors
- Sightlines within the dispatch room

Acoustics

The design of the PSAP must be such that the ambient sound levels in critical spaces are appropriate and do not interfere with the activities occurring therein. The Noise Criteria (sound level) experienced in the various spaces should not exceed those tabulated below.

Area	NC Level	Notes
PSAP	35	
Equipment Room	50	Assumes room normally unoccupied
Training/Conference Room	35	
Office/Administration Areas	40	

Provide duct sound attenuators as required. Packless type preferred. Duct lining to be avoided whenever possible.

STRUCTURAL DESIGN CRITERIA

Existing Building

We have no documentation to indicate the referenced building code at the time the original building was designed and constructed. The code-specific structural design loading criteria, as defined on the various drawing sets, are generally consistent with “office-type” structures of the time. For example, these buildings were generally designed for roof snow loads of 20-25 psf and wind speeds of 80 mph. The wind speed corresponds to out-of-plane wall loads of less than 20 psf. Capacities of the various structural framing elements (roof deck, joists, CMU walls, etc.) will likely be consistent with the documented design information.

None of the drawing information indicates the building structures were designed for any seismic load criteria or critical/hardened facility loads.

ICC 500 – Standard for the Design and Construction of Storm Shelters

The ICC 500 Standard defines all of the structural load criteria for use in the design and construction of facilities that need to function as hardened shelters in the event of catastrophic events. Based on its geographic location, the following design load criteria are applicable in order to meet the ICC 500 Standard:

Roof Live Load	100 psf
Wind Speed	160 mph (same for both Tornado and Hurricane)
Debris Missile Impact	84 mph on Vertical Surfaces; 56 mph on Horizontal Surfaces (15-pound sawn lumber 2x4)

In its current condition, the existing building structure may not be capable of supporting the design load requirements defined in the ICC 500 Standard. Using the ICC 500 Standard with a wind speed of 160 mph, it is likely that the walls would need to withstand an out-of-plane wind force approaching 100 psf.

GENERAL MECHANICAL

Codes / Standards

The mechanical systems are anticipated to be designed in accordance with the following state and federal codes / standards:

- International Building Code (IBC) 2015, with Washington State amendments.
- International Mechanical Code (IMC) 2015, with Washington State amendments.
- Uniform Plumbing Code (UPC) 2015, with Washington State amendments.
- International Fuel Gas Code (IFGC) 2015, with Washington State amendments.
- Washington State Energy Code (WSEC) 2015
- National Fire Protection Agency (NFPA) 13 current edition
- National Fire Protection Agency (NFPA) 101 current edition

As an Essential Facility the mechanical systems should meet seismic requirements, provide redundancy for equipment failure and consider utility service backup.

Existing Building

General Building

RiverCom is housed on the third floor of the Wenatchee Police Station building built in 2003. This facility was not purpose built to contain a 911 center but adapted to accommodate. The most significant mechanical issue this causes is that RiverCom does not have direct control over the building systems serving their space and it limits the scope of corrections that can be made.

The building is served by a central VAV (variable air volume) air handling system with split DX cooling and hot water heating. VAV zones are fan-less terminal boxes with hot water reheat. Hot water is supplied by central natural gas boilers. This system is of institutional quality with adequate zoning.

While this is an excellent building system, because RiverCom doesn't have control over its operation, there are temperature control issues with limited adjustment, slow temperature response, and some spaces not reaching the desired setpoint. Additionally, a building pressurization control issue causes the exterior security door not to latch on some occasions due to excess interior pressure relieving through the door.

Plumbing water and waste services are provided by municipal utility. Domestic hot water is generated by building central natural gas water heater. No corrections are recommended.

The building is equipped throughout with a sprinkler system. The RiverCom operation area has a pre-action system with an abort button. Notification of pre-action release is not apparent in the space, only at the control panel. A separate "agent release" device is present next to the abort button, but its function is unknown. We recommend that pre-action notification, particularly at the abort button be provided with instructional signage. The function of the "agent release" device should be determined, and instruction provided.

Dispatch

The area is served by a zone of the building VAV system. Two split-system fan coils are intended to provide redundant conditioning. The control and function of the redundant fan coils was not known. We recommend providing maintenance, repair and training for the redundant fan coils.

Offices

Each office is served by an individual zone of the building VAV system. While this is excellent zoning, capacity or control issues often result in uncomfortable temperatures. We recommend adjustments to the building HVAC control programming.

Equipment Room

The space is served by a dedicated Liebert unit with local control and has generator backup power. Redundant cooling is provided by the building VAV system, although switchover is not automatic, and the building system is not on generator power. Capacity is adequate for current and future needs. We recommend providing true redundant HVAC system with automatic switchover and generator backup power.

Fire protection is provided by the same pre-action system as Dispatch. We recommend an independent chemical agent suppression system in lieu of sprinklers.

Break Room / Kitchen

The room is an independent zone served by the building VAV system. No exhaust is present which sometimes results in odors. Only a small sink is present and no dishwasher. We recommend providing local exhaust and a dishwasher.

Utilities

The facility design will need to consider the loss of utility delivered fuels that are used as the source of building heating system and/or emergency generator. Natural gas will likely remain as the primary fuel source with propane as a possible option for a back-up source if needed. This should be further discussed when actual design for this facility ensues.

HVAC

System Options

Although a final systems selection will occur during the design process, the following criteria are recommendations for a new building project.

1. System(s) should be energy efficient.
2. System(s) should provide high indoor air quality and incorporate energy recovery ventilation.
3. Single outdoor intake (if possible) located to minimize threat and contamination.
4. System(s) should provide redundancy for Dispatch and Equipment Room.
5. System(s) should provide adequate zoning for temperature control comfort.
6. System(s) control should be straight forward for ease of use and adjustment.
7. System(s) should avoid service utilities which are not reliable and can't be backed-up (i.e. natural gas).

System types that can be considered include:

1. Multi-zone variable refrigerant flow (VRF) heat pump with DOAS/ERV.
2. Central VAV (variable air volume) air handler with zone reheat.

Option 1: VRF/DOAS/ERV

The systems under this option would be an air cooled variable refrigerant flow (VRF) heat pump system. Ventilation would be handled by a dedicated outside air (DOAS) energy recovery ventilator (ERV) unit. These VRF/DOAS/ERV systems would serve all portions of the building except for the Equipment Room.

The VRF system will meet the heating and cooling needs of the spaces. VRF is a refrigerant based system with multiple zones comprised of outdoor condensing units coupled with a series of indoor terminal units provided in each space for individual room control. The terminal unit types may be either wall mounted cassette units, ceiling mounted cassette units or ceiling concealed ducted units. A VRF system provides heat recovery between spaces and allows simultaneous heating and cooling within the system, as well as, increased energy efficiency. The VRF system will utilize environmentally friendly refrigerant (no CFC's will be utilized).

The dedicated outside air (DOAS) units with energy recovery (ERV) will provide the required ventilation air to each occupied space. The heating source for this unit will likely be in the form of electric resistance heat. The DOAS/ERV unit will also exhaust air from restrooms, kitchen, etc., recovering energy to precondition the outside air. Humidification or dehumidification is not anticipated. High efficiency filtration of the supplied ventilation air will promote good indoor air quality.

The VRF/DOAS/ERV systems offers several advantages for this type of project. It is primarily a piping-based system which requires less ceiling space than more conventional ducted systems. It's also a highly efficient system and allows for individual space temperature control. Redundancy for the Communications Center can be provided by overlapping coverage of two independent VRF systems.

Option 2: Chilled water fan coils with electric heat

The primary cooling source for this option will be a pair of air-cooled chillers. The chillers will likely be located at grade and will utilize environmentally friendly refrigerants (no CFC refrigerants will be utilized). The location and sound treatment of the chillers will be evaluated to minimize the resulting sound levels within the new building, as well as, adjacent buildings. Two (2) chilled water pumps (primary and standby) will circulate chilled water to cooling coils within each fan coil unit. This system would serve all portions of the building except for the Equipment Room.

Heating is provided by electric resistance heat at each fan coil. Fan coils provide heating and cooling for each zone and can be zoned for individual room control. Fan coils are typically ceiling concealed ducted units with local return air.

Ventilation will be provided by a DOAS/ERV system as describe in Option 1.

Redundancy for the Communications Center can be provided by multiple chillers with redundant pumps and redundant fan coils.

Equipment Room

The equipment room system(s) should be dedicated to this room and provide N+1 redundancy. Equipment should be specialized for computer room service and include humidification and dehumidification.

Controls

A direct digital control (DDC) automatic temperature controls system with electric actuation will be provided. The extent of the system will be coordinated with RiverCom 9-1-1 during the design phase of the project, however, a central building temperature control system is anticipated. The central building control system will be accessed via a head end computer located in the mechanical room and/or at a remote central location. The DDC system shall provide time of day control, startup, temperature control, safeties, alarms, etc. Each control function and associated control point of all mechanical equipment would be incorporated into the central system.

Each space should be provided with independent temperature controls. All major mechanical equipment items (VRF system, chillers, boilers, air handling units, pumps, etc.), as well as all air terminals, temperature sensors, filter status, etc., will be capable of being controlled and/or monitored locally at the building and through the central energy management control system (EMCS).

PLUMBING

Natural Gas System

This gas service will be evaluated during design. Gas piping will be extended to HVAC equipment (i.e. DOAS units and/or boilers) and domestic water heater(s). Where possible, gas piping will either be routed along the roof or in the crawl space.

Domestic Hot and Cold-Water Piping Systems

The plumbing system(s) should be of an institutional quality level. The following criteria are recommendations for a new building project.

1. Minimum water pressure of 30 psi.
2. Hot water generation and storage at 140F to prevent Legionella with mixing valve(s) for distribution at 120F (adjustable).
3. Hot water recirculation.
4. No water piping above the equipment room.
5. No plastic piping.
6. Water reserve storage in case of water utility failure.

Sanitary and Vent Systems

Sanitary drainage will be provided and extended five (5) feet beyond the building wall. The existing building exit locations will be evaluated based on the new layout and considered for re-use.

All toilet rooms and mechanical rooms shall be provided with floor drains. All drains will include a trap primer. Vent piping will extend up through the roof with termination points coordinated with rooftop unit outdoor air intake locations.

Stormwater Piping System

Roof drains and the associated storm water distribution system will be provided, collected and extended five (5) feet beyond the building wall for connection under the Civil Division. Horizontal rain leaders will be insulated to prevent condensation. Secondary storm water system options will be evaluated during the design phase of the project. Air conditioning condensate drain piping will be extended a) from indoor air conditioning equipment and connected to the storm water system and b) from rooftop air conditioning equipment to roof drains.

Plumbing Fixtures

Fixtures shall be furnished in sufficient quantity to satisfy the applicable plumbing code and the needs of the user. Handicapped fixtures shall be provided within the requirements of the State Codes and the ADA Codes. Fixture types will be coordinated with the architect and the user and designed to meet the water efficiency and aesthetic goals of the project.

Fire Protection

The fire protection system should be designed and installed in accordance with the rules and regulations of the International Building Code, International Fire Code, appropriate County and State Codes, Insurance Underwriter, Local Fire Department Standards, NFPA Codes, and any other authority having jurisdiction.

The facility, except for the Equipment Room, should be protected by an automatic wet-pipe sprinkler system with a pre-action zone for the Dispatch area. The Equipment Room should be protected by a chemical suppression system.

ELECTRICAL

Electrical design for facility meeting current codes and standards

The electrical systems will be designed in accordance with applicable local, state and federal codes/standards including the National Electric Code, NFPA 101, NFPA 72 and the Washington Administrative Code WAC-296-46B – Electrical Safety Standards, Administration and Installation.

Load Calculations

Preliminary electrical load calculations shall be performed in order to determine the approximate capacity of the electrical service in a new building. The proposed building load requirements are based on VA/sq. ft. considerations for this type of building. The following data summarizes these calculations:

Lighting	- (1.5 VA/sq. ft.) x (125% demand – continuous load)
HVAC (General)	- (14.0 VA/sq. ft.) x (100% demand)
Receptacle (General)	- (4.0 VA/sq. ft.) x (50% demand over 10.0 kVA)
Receptacle (Consoles)	- (11 VA/sq./ft.) x (100% demand)
Data/Comm Space	- (115 VA/sq. ft.) x (100% demand) – Power and HVAC
Miscellaneous	- (2.0 VA/sq. ft.) x (100% demand)

Existing Facility – The existing call center shares the electrical service with the police station. The electrical service consists of a 1200A, 480Y/277 volt, 3-phase, 4-wire service switchboard. The maximum demand for the previous 30 days was 103.7 kW, or around 140 amps at 0.9 power factor. The service size for this building is adequate for the use and would accommodate load modifications to the existing facility, assuming no building additions of considerable size are made.

Primary Service

The service entrance disconnect shall be located within the building. The utility company transformer shall be located at a location to avoid accidental or deliberate damage, and the primary and secondary ductbank/conductors will be routed underground. The secondary of the transformer will provide a building system voltage of 480Y/277 volts, three phase, four wire. A concrete encased secondary ductbank(s) for lateral secondary service conductors will be extended from the transformer to the current-transformer (CT) compartment, located within the building.

Existing Facility - Primary power is fed to a pad-mounted transformer via an adjacent vault, which is fed underground from a pole at the SE corner of Yakima and Chelan. The primary service is fed overhead from Chelan County PUD to this pole. The

secondary service from the transformer to the building is via a concrete encased secondary ductbank and the CT compartment is located within the building on the garage level. The PUD transformer should be replaced with one rated for below-ground use, mounted in a below-grade vault to avoid the possibility of damage and flooding of transformer compartments.

Dual power supply from the utility may be desired by the Owner to provide increased electrical service reliability. Further coordination is required to determine this. A dual utility power supply for the existing building is not feasible due to space restraints for a second service switchboard with utility metering and a tie breaker between it and the existing switchboard.

Main Service Equipment

A 480Y/277 volt service entrance switchboard will be provided in the main electrical room to distribute power throughout the building. The switchboard will be provided with the following components:

- Main circuit breaker, amperage to be determined.
- Digital power monitoring device.
- Surge protective device (SPD).
- Distribution feeder circuit breakers to supply the main building.
- Circuit breakers with digital adjustable trip units will be provided for selective coordination.

Existing Facility – The main service switchboard in the existing facility contains (5) circuit breakers (main service disconnects), with one 600A/3P circuit breaker feeding the standby section via an automatic transfer switch. The standby section contains a surge protective device and several circuit breakers that do not contain an adjustable trip unit. A fault on any of these feeders without an adjustable trip breaker could trip the 600A/3P circuit breaker feeding the standby switchgear section and possibly the generator output breaker.

Distribution Equipment

The service entrance switchboard shall supply normal (non-generator) loads and two (2) automatic transfer switches (ATS's), one (1) for the building *emergency* distribution system (NEC 700) and one (1) for the building *optional standby* system (NEC 702).

Panelboards shall be located within electrical rooms throughout the building. These panelboards will consist of 480Y/277 volt lighting and power panelboards and 208Y/120 volt panelboards for receptacle and small mechanical equipment loads. Dry type transformers will be used in locations to step down the voltage from 480 volts to 208Y/120 volts. All panelboards will be provided with copper bus bars, equipment ground busses, bolt-on molded case circuit breakers, and door-in-door cover with piano hinge. 208Y/120 volt panelboards serving areas with a high density of computers will be specified with two-hundred percent neutral bus bars.

Motors will be controlled using individual full voltage, non-reversing, combination motor starters with NEMA rated contactors and motor circuit protector disconnects. Localized disconnect switches will be provided for all motor-driven equipment. Motors rated 3/4 horsepower or greater will be 480 volt, three phase and motors rated less than 3/4 horsepower will be 120 volt, single phase. Manual motor starters will be provided for all 120 volt single phase motors. All three phase motor starters will contain a solid state overload protection device with integral single phase protection.

Variable frequency drives (VFD's) will be provided for all motors that require adjustable speed operation. VFD's will be required to meet harmonic limits as specified in IEEE 519.

All current carrying conductors for all equipment will be copper.

Existing Facility – The main service switchboard supplies power to the normal loads and the standby loads via an optional standby (NEC 702) automatic transfer switch. The entire 911 call center and supporting areas are fed from the optional standby generator. Instead of an emergency (NEC 700) transfer switch, the emergency loads (emergency egress lighting and fire alarm control panel) contain integral battery backup for the required 90 minutes.

The panelboards feeding the 911 call center functions are all located in the 3rd floor equipment/server room. The panelboards do not have door-in-door covers, which are not a safety concern, just an increase in time required for troubleshooting evaluations. Based on the record documents, the panelboards were specified with copper bus bars, equipment ground busses and bolt-on molded case circuit breakers. The current-carrying conductors appear to be copper, which comply with the record drawings.

Feeders and Branch Circuits

All conductors/circuits will be installed as follows:

- Interior concealed branch circuit wiring located in dry locations will be installed in electrical metallic tubing (EMT). Liquid-tight flexible metal conduit will be used for final connections to vibrating equipment such as motors and transformers. Metal-clad (MC) cable will be allowed for final connections to light fixtures.
- Exposed interior branch circuits will be rigid galvanized steel where subject to physical damage and EMT elsewhere.
- All EMT fittings will be steel compression fittings with insulated throats.
- Wiring installed in exterior and wet locations will be installed in rigid metal conduit with liquid-tight flexible metal conduit used for final connections.
- Underground conductors will be installed in direct buried PVC conduit except as noted below.
- Underground service conductors and generator conductors will be installed in concrete encased PVC ductbanks.
- Conductors installed underneath of raised floor areas will be installed in liquid-tight flexible metal conduit with waterproof device boxes.

- All conductors will be copper conductor with type THHN, THHW, or XHHW insulation.
- All feeders and branch circuits will be provided with a separate green insulated equipment grounding conductor. Conductor sizes #10 and smaller shall be solid; conductor sizes #8 and larger shall be stranded.

Existing Facility – The feeders and branch circuits in the existing facility comply with the above except for the following:

- Final connections to vibrating equipment such as motors and transformers utilize flexible metal conduit (not liquid tight).
- EMT fittings are set-screw type.
- Conductors installed underneath the raised floor areas are installed in flexible metal conduit (not liquid tight).

Generator Power

A 480Y/277 volt generator will be located inside the facility located remotely from the main entrance, vehicle circulation, parking and maintenance areas. The generator will be diesel powered with a sub-base fuel tank capable of running the generator for 72 hours at full load. The generator will be used to supply power to emergency (NEC 700) and optional standby (NEC 702) distribution systems located in the building. The generator will supply two (2) ATS's located in the building, one for the emergency system and one for the optional standby system. Loss of normal power at either ATS will result in the automatic starting of the generator.

The following loads will be connected to the generator supplied emergency system and must be operational within ten (10) seconds after a power outage:

- Egress and exit lighting.
- Fire detection and alarm system (also provided with integral battery backup).

The following loads will be connected to the generator supplied optional standby system:

- Public Address System.
- Telephone System.
- Receptacles adjacent to fire and security panels.
- Generator auxiliary systems.
- HVAC split system(s) serving critical telecomm rooms.
- Central UPS system that supplies the communication center, EOC, console training area, and associated equipment rooms (i.e. data room, UPS room, radio room, etc.).
- Other non-life safety loads identified by the Owner pending further coordination.

The size of the generator shall be determined by NEC Article 220.

Dual generator supply may be desired by the Owner to provide increased electrical service reliability.

Existing Facility – The standby system for the existing facility consists of a 300 kW/375 kVA, 480Y/277 volt, 3-phase, 4-wire diesel generator with a 520 gallon sub-base fuel tank. The generator's fuel consumption is approximately 23.1 gallons/hour at full load, so the tank would supply the generator for a total of 22.5 hours. The generator is located in the SW corner of the first floor with access through the secured parking garage. The generator calculated demand load of 294.0 kVA. (The maximum demand as measured by Chelan County PUD for the previous 30 days was 103.7 kW, or around 140 amps at 0.9 power factor for the entire facility.) There is not a separate automatic transfer switch for the emergency system (NEC 700). Instead, the emergency loads (emergency egress lighting and fire alarm control panel) have integral battery backup. The remaining 911 call center loads are connected to the optional standby (NEC 702) automatic transfer switch and will be connected to the generator upon loss of normal utility power.

The generator room was originally sized to accommodate a second, 100 kW/125 kVA diesel generator. This generator was going to serve as a redundant backup to the main 300 kW generator via a manual transfer switch. This second generator was not installed but the space in the generator room remains vacant. The redundant generator could potentially be installed where originally designed and a feeder could be routed to the existing manual transfer switch. Since the generator connection would not be through an automatic transfer switch, the generator size could be sized for the actual demand load (using 30-day demand metering) vs. the calculated load per the NEC.

A larger fuel tank should be considered to achieve 72 hours of runtime at full load.

UPS System

A dedicated central UPS system with internal maintenance bypass will be provided to supply power to critical equipment located within the communication center, console training area, and associated equipment rooms (i.e. data room, UPS room, radio room, etc.). The UPS and associated batteries must be located remotely from the main entrance, vehicle circulation, parking and maintenance areas.

Existing Facility – The UPS and maintenance bypass switch are located in the 3rd floor equipment/server room and, according to the record drawings, is rated 24 kW/30 kVA. The UPS battery bank is located on the first floor with access via the secure parking garage, which is practically the furthest point in the facility from the UPS and bypass switch. The batteries are also located directly adjacent to the ammunition storage room. To decrease the potential disruption of service to the UPS, consideration should be made to relocate the battery racks to a location closer to the UPS and further away from the ammunition storage. According to the record drawings, the calculated demand load on the UPS is 36.0 kVA, or 100 amps at 208Y/120 volts, 3-phase. This exceeds the rating of the UPS and the 70A/3P main circuit breaker on the PSAP – Building UPS Distribution Panel. The UPS load should be monitored for a minimum of 30 days to verify that the system is not overloaded or approaching an overload condition.

Grounding

A complete grounding electrode system and equipment grounding system will be provided in accordance with NFPA 70, National Electrical Code, and local codes and regulations. A grounding electrode system will be provided at the building service entrance, step-down transformer and the generator location.

Existing Facility – A complete grounding and grounding electrode system has been provided in accordance with applicable codes.

Motorola R56 Requirement

It is anticipated that designated areas such as the communication center, console training area, and associated equipment rooms (i.e. data room, UPS room, radio room, etc.) will contain specialized grounding equipment and related systems in accordance with Motorola R56 (Standards and Guidelines for Communication Sites).

Existing Facility - Grounding to server racks and dispatch workstations should be modified to meet R56 standards.

Critical Operation Power Systems

The applicability of NEC Article 708 (Critical Operations Power Systems) has not been determined for this project pending further coordination with the Authority Having Jurisdiction (AHJ). This requirement, if mandated, is applicable to vital infrastructure facilities that if destroyed or incapacitated, would disrupt national security, the economy, public health or safety. It is the decision of the Owner and the AHJ to determine if this requirement is mandated for this project. If mandated, the following general requirements will apply to the facility electrical systems in designated critical areas:

- Feeder wiring shall be protected from physical damage.
- Feeder wiring shall be a listed electrical circuit protective system with a minimum 2-hour fire rating.
- The normal and emergency power distribution equipment shall be located in spaces with a 2-hour fire resistance rating and shall be located above 100-year floodplain.
- Fire alarm wiring shall be protected from physical damage.
- Fire alarm wiring shall be riser-listed and shall be a listed 2-hour electrical circuit protective system.
- Control, monitoring, and power wiring to HVAC systems shall be protected from physical damage.
- Control, monitoring, and power wiring to HVAC systems shall be a listed 2-hour electrical circuit protective system.
- Surge protective devices shall be provided at all facility distribution voltage levels.
- The entire facility electrical power system shall be supplied by a permanent on-site diesel powered generator in the event of loss of power.

- Means to connect a portable or vehicle-mounted generator shall be provided.
- The on-site fuel supply for the emergency generator shall be secured and protected in accordance with the risk assessment.
- The emergency generator shall be capable of operation COPS for a minimum of 72 hours at full load with a steady-state voltage within +/- 10% of nominal utilization voltage.
- Means for testing critical power system during maximum anticipated load condition shall be provided.
- Commissioning plan shall be developed, documented and implemented.

If NEC Article 708 is mandated for this project, the exact means and methods for compliance will be determined as part of ongoing design development and coordination with the AHJ and County personnel.

Existing Facility – Article 708 was added to the National Electrical Code in the 2008 edition, after this facility was built. Major electrical modifications would be required in order to bring this building up to NEC 708 compliance, including the following:

- Existing feeder and HVAC wiring for the PSAP area would be required to be changed to a listed electrical circuit protective system with a minimum 2-hour fire rating, consisting of a listed assembly or concrete encasement. Similar requirements for the fire alarm wiring.
- The rating of the spaces enclosing the normal and emergency power distribution equipment would be increased to 2-hour fire resistance rating and shall be located above 100-year floodplain. This may not be feasible.
- Surge protective devices would be required at all facility distribution voltage levels.
- Means to connect a portable or vehicle-mounted generator would be required, including an additional manual transfer switch.
- Additional generator fuel storage would be required for a run time of 72 hours minimum.

Due to the existing conditions, providing the changes required for NEC 708 compliance would not be feasible in this building.

Short Circuit Calculations

A short-circuit, coordination, and arc-flash study will be performed during construction as part of the contractor requirements based on the short circuit capacity available at the proposed building pad mount transformer. The maximum available short circuit capacity at the main service points will be calculated based on the available utility short circuit capacity and any notable contributions from motor loads.

Existing Facility – A short circuit calculation was performed prior to construction and the rating of the electrical equipment complies. The arc flash study requirements were not included in the NEC at the time of construction, so a study should be completed, and permanent labels affixed to the equipment for safety of the maintenance personnel. Selective coordination was not required for this facility, so not all overcurrent devices are adjustable. A coordination study should be performed for the adjustable breakers to achieve the highest level of coordination possible with the existing equipment.

Lighting

The lighting design for the building will be in accordance with the design requirements, County requirements and usage of each area. Zonal cavity and/or point by point calculations will be performed for each space or representative space utilizing effective reflectance of ceiling, wall, floor, light loss factor and the co-efficient of utilization to maintain the recommended light level at the working surfaces. Coefficient of utilization will be obtained from the particular lighting fixture cuts after the final fixture selections are completed. IES recommended foot-candle levels will be maintained throughout the building.

It is anticipated that all interior light fixtures will contain LED lamps. Lighting types in major areas will be as follows:

- General areas with hung ceilings including offices, corridors, reception, and administration areas: recessed 2 X 4 direct/indirect volumetric troffer.
- Storage and utility areas with hung ceilings: recessed 2 X 4 troffer with .156" acrylic prismatic lens.
- Conference Rooms: recessed 2 X 4 direct/indirect volumetric troffer and recessed downlights.
- Communication center, EOC and console training areas: suspended direct/indirect architectural linear fixture.
- Mechanical/electrical/utility spaces with open ceilings: 4' linear industrial type fixture suspended from ceiling.
- Exterior lighting (pedestrian, parking lot, and building mounted): Exterior pedestrian, parking lot, and building mounted lights will be provided. Further coordination with the Owner will be required to determine if exterior lighting levels will be in accordance with IES standard parking lot levels or if elevated lighting levels in accordance with IES critical infrastructure will be required.

Egress and exit lighting will be provided in accordance with NFPA Life Safety Codes.

Low voltage lighting controls will be provided in each space to provide automatic control functions required by current energy codes.

Existing Facility – The lighting systems in the existing 911 call center portion of the building consist of fixtures utilizing primarily fluorescent and compact fluorescent lamps. The automatic-off requirement of the energy code was not required for all occupancies during the time of construction, so only the restrooms have this feature. To achieve possible energy savings and desired controllability, all fixtures should be replaced with fixtures utilizing LED lamp technology and localized, low-voltage controls should be added. Indirect fixtures and increased user controls should be added to the dispatch area for increased comfort and ergonomics. Egress and exit lighting shall contain integral battery backup since an emergency automatic transfer switch is not present.

It is estimated that the lighting levels around the building and in the parking areas is under 4 footcandles, which does not meet the best practices recommendations for mitigating risk. Additional lighting fixtures or an alteration of the existing fixtures would be required to meet these lighting levels. A study would be required to determine if these lighting levels are possible under the current Washington State Energy Code.

Receptacles

General convenience receptacles will be specification grade, duplex, NEMA 5-20R, installed in flush mounted wall boxes. Receptacle spacing will be adjusted to coordinate with office equipment locations. General convenience receptacles for cleaning will be spaced approximately forty feet on center throughout all corridors and lobbies.

Ground fault circuit interrupter (GFCI) receptacles will be used in the following locations:

- Adjacent to sinks.
- All wet locations.
- Receptacles with weatherproof while-in-use covers will be provided for all exterior locations.
- Vending machines.

Special receptacles for appliances and equipment will be provided in NEMA configurations as required to coordinate with the appliance or equipment being served.

Device plates will be provided for all outlets in quantity of gangs to accommodate associated device. All device plates in finished areas will be brushed stainless steel with a Type 302 finish. Device plates in unfinished areas will be galvanized steel.

Existing Facility – The receptacles noted during the site survey comply with the requirements above, except the vending machine receptacles which are not GFCI-protected (not required at the time of construction). The vending machine receptacles can be changed to GFCI type with minimal expense.

Fire Alarm System

An addressable, electrically supervised, microprocessor based fire alarm and detection system will be provided. Initiating devices will include manual stations, smoke detectors, thermal detectors, duct type smoke detectors, interface modules for sprinkler flow switches and OS&Y valve position switches. Indicating devices will include combination horn/strobe devices, and supplementary visual devices. Auxiliary devices will include control modules for remote signaling and control. All fire alarm circuits will be installed in conduit. The fire alarm control panel will be located in the main electrical room. A liquid crystal display (LCD) alpha-numeric fire alarm annunciator panel will be provided at the main entrance into the building with a graphic map located adjacent to the panel. The fire alarm system will be connected to central monitoring system via digital alarm communication transmitter if required by the local Authority Having Jurisdiction. Twenty-four (24) hours of operating capacity through battery back-up will be provided for the fire alarm control panel.

Existing Facility – The facility contains a complete fire alarm system with full coverage. The fire alarm system is shared between the police station and the 911 call center. The fire alarm control panel is located on the first floor in the telecomm room.

Lightning Protection

A complete Underwriters Laboratories (UL) Master Label lightning protection system will be provided for the building including the installation of rooftop air terminals, down conductors, and grounding electrodes. A counterpoise grounding system consisting of ground rods and buried interconnecting ground wire encircling the building will be provided. Structural steel or separate conductors will be used as down conductors to interconnect the rooftop lightning air terminals with the below grade counterpoise system. All building grounding systems including electrical service and telecommunications will be connected to the counterpoise. All grounding connections below grade will be exothermic welds.

Existing Facility – A full lightning and grounding system consisting of the components listed above is present on building and connected to the ground bus at the main switchboard.

Telecommunications and Special Systems

The electrical contractor will provide empty raceways and junction box rough-ins for all voice/data, audio visual, video surveillance, door access and communication systems. All cable, jacks, face plates, devices, and central system components will be provided by the associated system provider/installer.

Telecommunication outlets will typically consist of recessed 4" or 4-11/16" junction boxes with 1" or 1-1/4" empty conduit extended to the closest accessible ceiling space.

Existing Facility – All voice/data, audio visual, video surveillance, door access and communication systems are existing in the building. The telecommunication services enter the building on the 1st floor in Telecomm Room 123. The card access system is shared with the police station and should be replaced with dedicated system for call center.

Seismic

The Communications Center, EOC and Equipment Room may be classified as an Essential Facility according to the IBC. In addition, all electrical components may need to meet the Seismic Design Requirements.

Existing Facility – Seismic restraints should be added to the switchboard and generator. Seismic support should be added to the lighting in the dispatch area. Server racks should be replaced with seismic-rated type.

CONCEPT OPTIONS

INTRODUCTION

The focus of this study was to develop a state-of-the-art program specifically for RiverCom 9-1-1's Communications facility and then to test it in two scenarios. The first scenario is to test the program within the confines of the existing facility plus whatever space it takes to accommodate most of the proposed program. This encompasses the existing space plus the gym space currently utilized by the police department on the third floor of the Wenatchee Police Department/ RiverCom 9-1-1 facility. The second scenario includes test fitting the program on a "green-field" site. The term "greenfield site" is proposed for any property acquired by RiverCom 9-1-1 where a new facility and appropriate site work might be constructed. This option is fairly generic because no property was proposed to consider for development.

Given the capabilities and building area of the existing space occupied by RiverCom 9-1-1, the goal for Scenario #1 was to further decide what additional space might be required within the existing bounds of the building footprint to accommodate the given program. The planning team was tasked with developing a concept diagram reflecting the programming effort outlined in Section 3 of this document and then to test the concept diagram.

With the building area requirements established, the next step was to determine if both the existing building and a "greenfield site" might also be reconfigured to accommodate the modified needs of the RiverCom 9-1-1 program. The team located typical site amenities as well as site hardening components to determine if all could be accommodated in the new scenarios.

Scenario #1 – Renovation and Expansion of the Existing Facility within the Third Floor Footprint

The existing RiverCom 9-1-1 facility is located on the third floor of the Wenatchee Police Department building located at 140 South Mission St., Wenatchee, Washington. The site is bound by an alley directly to the west and then South Chelan Avenue, by South Mission Street to the East, by Yakima Street to the south and by its own parking lot and then Orando Avenue to the north. Given its third-floor location the facility is land (and building) – locked and so expansion beyond the footprint is impossible.

Within the third floor footprint, RiverCom 9-1-1 utilizes approximately 50% of the third-floor space. The balance of the floor space is occupied by the gym and the locker rooms for the Wenatchee Police Department. For the sake of this study, no specific space was offered up to investigate expansion within however the planning team elected to pick space that had the greatest opportunity for expansion while disturbing as little of the police function as possible.

Given the intent of reducing cost impact and disturbing as little functional space as possible, the planning team elected to propose expansion of the program into the existing gymnasium while providing for a corridor around that space to allow police officer access to the locker rooms. Obviously, reduction of police function will not be looked upon favorably however it is the least disruptive expansion possible within the footprint of this facility.

Again, in the interest of minimizing expansion, many areas of the proposed concept compromise building area projected for the functional use of the organization as shown in the program developed in Section 3 of this document. The drawings included below show the composite program expanding within the gym footprint mostly to allow for the accommodation of IT support personnel spaces. Other program areas are modified subtly to reflect a relative improvement to the facility for the RiverCom 9-1-1 personnel.

The building area used on the third floor of the current Wenatchee Police Department for this concept plus the conference room on the lower floor allows for approximately 8,785 s.f. of Gross Program Area. It could be assumed that 600 s.f. of building support space (MEP Area) is dedicated to the RiverCom 9-1-1 function. That total suggests $8,785 \text{ s.f.} + 600 \text{ s.f.} = 9,385 \text{ s.f.}$. Then, utilizing the 10% building GSF it brings the total proposed building area of 10,323 total square feet. The Program identified in Section 3 shows a Gross Programmed Building Square Footage of approximately 13,747 s.f. The difference between that which can be housed within the existing third floor footprint (and other areas) and the state-of-the-art program is approximately 3,423 s.f. Areas that are missing or short of square footage are identified on the drawing provided in this section.

The missing square footage for the program is already a compromise from the proposed Building Program identified in Section 3. Further, the building systems identified in Section 2 that require upgrades or improvements have a cost to begin to meet the code requirements and recommendations for a state-of-the-art Communication Facility. As the agency evolves there may be space challenges as well as building system challenges if the agency renovates the existing facility.

Concept drawings for the proposed renovations and expansion follow in this section.

Scenario #2 – Greenfield Site Concept

The original intent of the “greenfield site” concept was that several sites might be identified around the City of Wenatchee to test-fit the building program and site program on. Given the timing of the study it does not appear that sites appropriate to this need have been identified. Therefore, in the interest of providing some level of conceptualization and budgeting for the location of the facility on a new site, the team has conceptualized a facility on a flat parcel of approximately 5 acres somewhere in the Wenatchee area.

The building concept for the program identified in Section 2 suggests a proposed building plan with two separate building areas sharing one common core. In the interest of reducing overall construction costs, one side of the facility houses the office type

functions as well as the basic building amenities. The other side of the facility houses the “hardened” portions of the facility, including the Communication Center, the training/surge space, the 9-1-1 Equipment room and the mechanical, electrical, plumbing/ fire protection space. The thought is that the office-type spaces can have a reduced level of hardening to potentially reduce the cost of the building thus concentrating the expensive “hardened and redundant” items on the one side of the facility.

The plan also identifies a front “visitor” entry to the facility as well as a rear “staff” entry to the facility. The public access provides for a secure vestibule entry through a secure and monitored front door. The back, staff access, will allow for an access controlled point of entry/egress with reduced control and observation function.

It is assumed that the office portion of the facility may have a traditional 9’-0” to 10’-0” ceiling height which with clearances might suggest a top of steel height of 13’-0” to 15’-0” feet. The “hardened” side of the facility will have greater ceiling heights of potentially 12’-0” to 14’-0” feet and corresponding top of steel heights of 15’-0” to 18’-0”.

The building as a whole could be constructed of steel frame with various exterior cladding systems. The exterior of the office area might be constructed of masonry or similar material on a light guage metal framing back. The “hardened” portions of the facility might be a cavity wall masonry structure for rigidity.

From a site perspective, the conceptualized site is arranged in layers of hardening. Building standoff is set at 30 meters for non-cleared vehicle parking with bollards or other site impediments restricting vehicular access any further. The “cleared parking area” behind the gate and fence line provides for parking as close as 10 meters from the hardened portions of the facility.

Concept drawings for the proposed site and building follow in this section. It should be noted that once a site has been identified, the facility concept can be adapted in a multitude of ways. A simple solution was provided merely for the sake of this study and to provide information to develop a conceptual budget from.

Section Contents

Overall, this section provides the following information:

Diagram #1	Aerial Site Plan of the Existing Facility
Diagram #2	Existing Third Floor Plan
Diagram #3	Scenario #1 – Proposed Third Floor Plan
Diagram #4	Scenario #2 – Conceptual Site Plan
Diagram #5	Scenario #2 – Conceptual Floor Plan

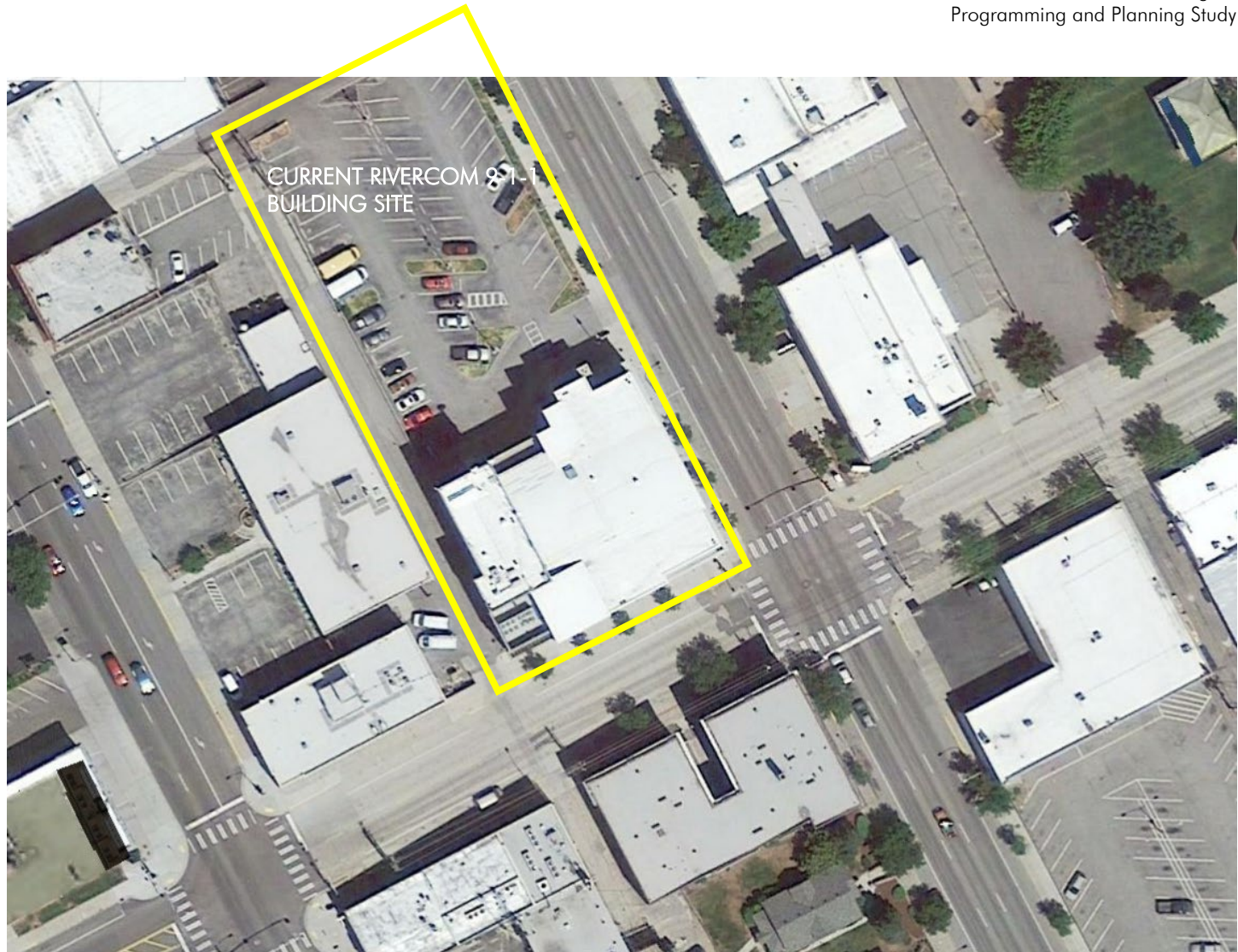
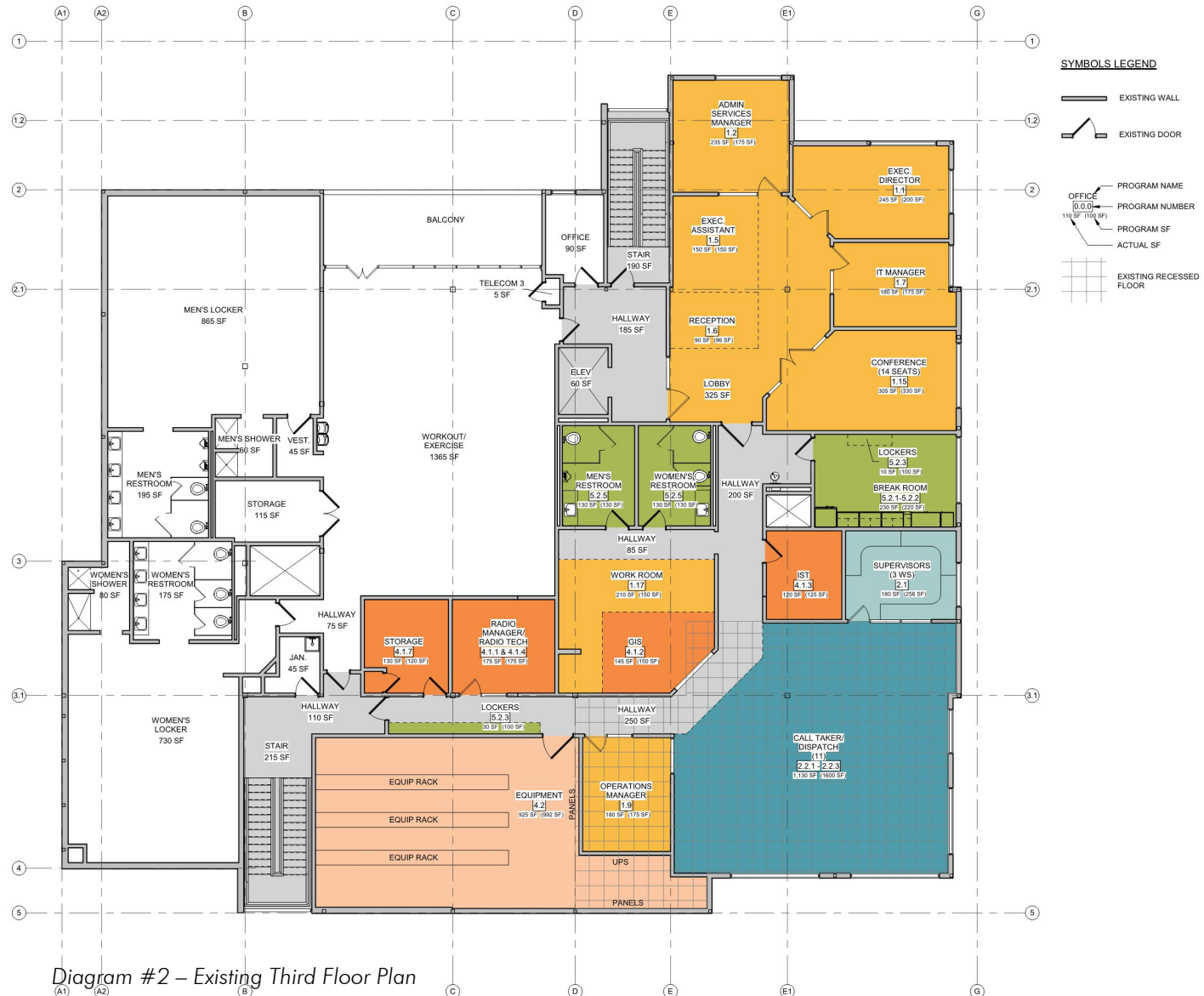


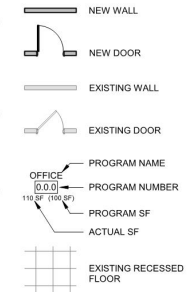
Diagram #1 – Aerial Site Plan of the Existing Facility



RiverCom 9-1-1
Wenatchee, Washington
Programming and Planning Study



SYMBOLS LEGEND



MISSING PROGRAM		TOTAL 3,653 SF
1.0	ADMINISTRATION	TOTAL 893 SF
1.3	ADMIN SERVICES FILING (UNDERSIZED)	40 SF
1.4	FUTURE HR MANAGER	175 SF
1.8	IT ASSET STORAGE	50 SF
1.10	FUTURE QA/QI MANAGER	175 SF
1.11	FUTURE PUBLIC DISCLOSURE OFFICER	96 SF
1.12	PUBLIC DISCLOSURE STORAGE	50 SF
1.13	FUTURE ADMIN. SUPPORT	96 SF
1.14	FUTURE ADMIN./ VENDOR/ AUDITOR	96 SF
1.15	CONFERENCE (UNDERSIZED)	25 SF
1.17	WORK/ COPY (UNDERSIZED)	20 SF
1.19	TOILET	70 SF
2.1	COMMUNICATIONS CENTER ADMIN	TOTAL 25 SF
2.1.2	SUPERVISORS (UNDERSIZED)	25 SF
2.2	COMMUNICATIONS CENTER	TOTAL 660 SF
2.2.1-3	CALL TAKER/ DISPATCH (UNDERSIZED)	410 SF
2.2.4	PRINTER/ SCANNER/ COPIER	100 SF
2.2.5	STORAGE/ SUPPLIES	150 SF
3.0	TRAINING	TOTAL 698 SF
3.1	CONSOLE TRAINING AREA	448 SF
3.2	TRAINING MANAGER OFFICE	175 SF
3.3	SECURE FILES/ STORAGE	75 SF
4.1	TECHNOLOGY OFFICE	TOTAL 50 SF
4.1.7	SECURE STORAGE (UNDERSIZED)	50 SF
4.2	EQUIPMENT ROOMS (UNDERSIZED)	TOTAL 67 SF
5.1	FRONT OF HOUSE	TOTAL 270 SF
5.1.1	SECURE VESTIBULE	100 SF
5.1.2	LOBBY/ WAITING	100 SF
5.1.4	TOILET ROOM	70 SF
5.2	BACK OF HOUSE - PERSONNEL SUPPORT	TOTAL 640 SF
5.2.3	LOCKERS (UNDERSIZED)	60 SF
5.2.6	TOILET ROOMS WITH SHOWERS	200 SF
5.2.7	LACTATION	80 SF
5.2.8	FITNESS ROOM	250 SF
5.2.9	STORAGE	50 SF
5.2	BACK OF HOUSE - BUILDING SYSTEMS	TOTAL 350 SF
5.3.5	MAINTENANCE/ CUSTODIAL STORAGE	200 SF
5.3.6	CUSTODIAL CLOSET	50 SF
5.3.7	BUILDING STORAGE	100 SF

Diagram #3 – Scenario #1 - Proposed Third Floor Plan

SCHRADERGROUP
design | planning | programming

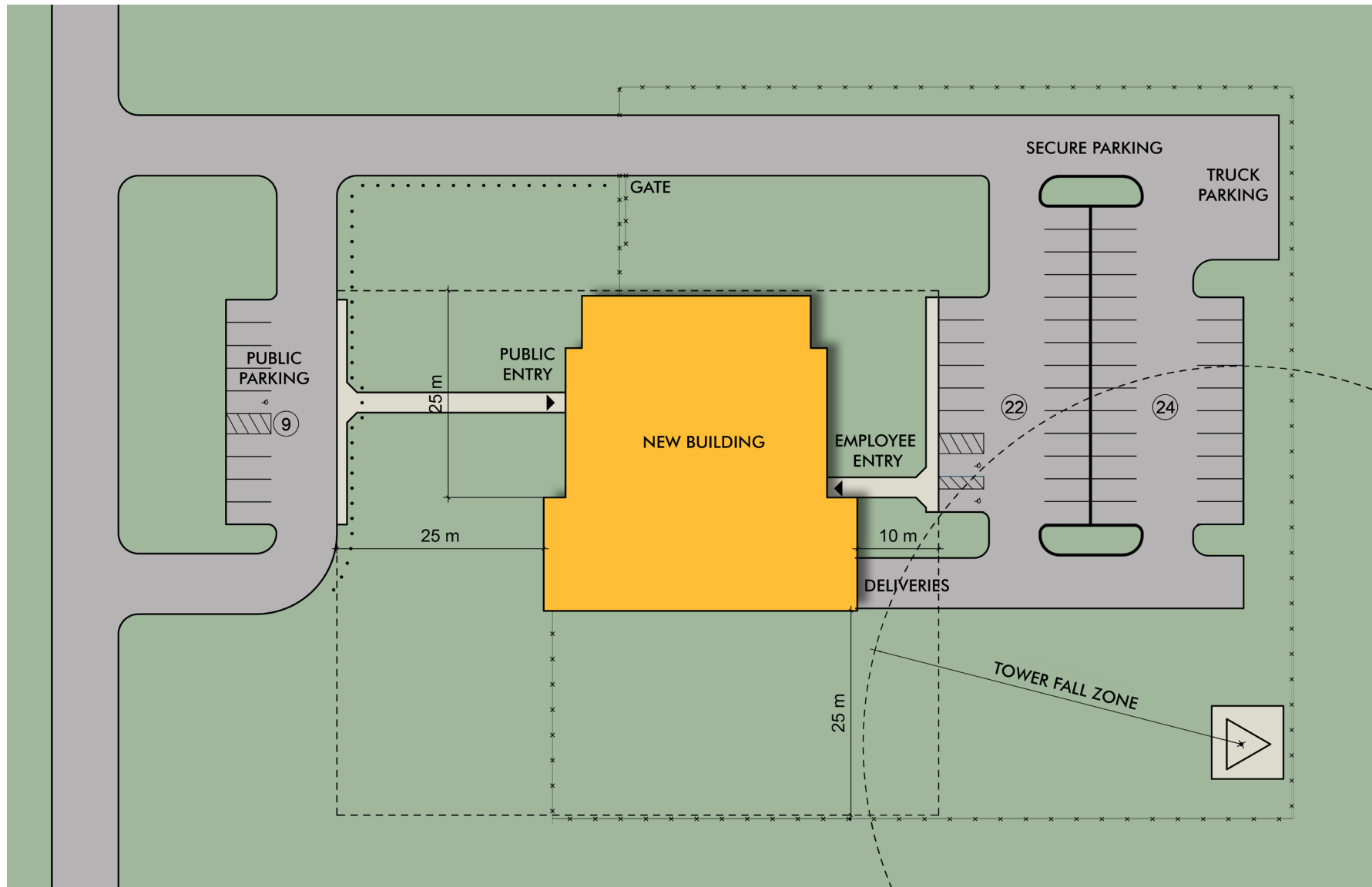


Diagram #4 – Scenario #2 – Conceptual Site Plan



Diagram #5 – Scenario #2 – Conceptual Floor Plan

CONCEPTUAL BUDGET

INTRODUCTION

Section 3 of this document provides an architectural program developed through the Programming Workshop. As previously noted, the intent of this study is to evaluate two scenarios for the future of RiverCom 9-1-1. Scenario #1 is to continue operations of the agency within the confines of the third floor but with some expansion into the Wenatchee police fitness area to allow for part of the expansion required by the programming effort. Scenario #2 is the construction of a new facility somewhere in the Wenatchee area.

The two scenarios are estimated separately in this document. Several caveats; as noted in other areas of this document:

- Scenario #1 does not provide for the full program developed and provided in Section 3 of this document. So, there is inequality between the two Scenarios.
- Technology costs are not provided in these estimates. Technology can have a significant impact on budgeting for projects such as these specifically because of the need to maintain operations in the existing facility as well as the new facility throughout the cutover.

For the costs identified in this Section, SCHRADERGROUP utilized line item cost estimating techniques based on the CSI format to complete an estimate that correlates to the concept diagram and site diagram provided in Section 6. Local construction costs, escalation, general site information and knowledge of current construction pricing of communication facilities are included (as much as can be anticipated) in the estimates shown on the following pages. The costs included are for budgeting purposes only as no final design has been derived at this time, but the team obviously had the benefit of the concept diagram to work from. Escalation is included to a hypothetical midpoint of construction at a total of 5.00% annually in the estimates to follow.

When the design process has begun, more accurate cost estimate information will be generated.

BUDGET DESCRIPTION

Budget estimating includes items discussed in the Workshop Session and in the Systems Narrative described in other sections of this document. Note that all costs described in this document and all associated systems are considered to be part of this conceptual budget (with those exceptions described in “Exceptions and Clarifications” below).

The estimates included herein are line item conceptual budget estimates and are broken down to depict several of the types of project costs. The types of cost areas are described below:

Overall Budget Description

The overall budget includes the following:

- **CONSTRUCTION BUDGET** – Includes anticipated construction costs broken down to support the program area. HVAC and Electrical systems will be one of the greatest variables depending upon what type of HVAC system is selected. The total extent of renovations will also be a major variable.
- **DESIGN COSTS** – Includes anticipated project design costs including the testing services normally anticipated for a project of this type.
- **PERMIT COSTS** – Permit costs were excluded from this set of budget worksheets as the design team was directed to exclude those at this time.
- **TECHNOLOGY SYSTEMS & OTHER COSTS** – RiverCom 9-1-1 provided the estimates for the technology budgets. The required technology and costs will vary widely as some costs are in annualized budgets for the renovation scenario but for new construction, almost all new technology would be required in order to phase the move into a hot cutover. General building furniture is included in this breakout as well. As the project evolves there may be further development that modifies the technology needs.
- **CONTINGENCY** – Readers will note a 10% project contingency which is common at this stage of the project.

Obviously, no programming phase budget can anticipate all of the project costs that may arise during a design and construction process however the SCHRADERGROUP team's knowledge of this project type provides significant insight into the various project costs typically experienced. The hope is that these budgets provide a good foundation from which the agency can begin their decision-making process.

SUMMARY BUDGET ESTIMATES FOR EACH SCENARIO

The Summary TOTAL CONCEPT PROJECT BUDGETS are shown on the pages to follow for the two Project Concept Scenarios. They are then expanded upon in the individual budget worksheets to further describe the potential costs for each phase of the work following those pages.

SCENARIO #1 BUDGET ESTIMATE – Renovation within Current Facility

Cost Per Breakout	
Construction	\$ 1,070,586
Professional Costs	\$ 133,117
Technology and Equipment	\$ 1,956,400
Contingency	<u>\$ 316,010</u>
Total Conceptual Project Budget	\$ 3,476,113

SCENARIO #2 BUDGET ESTIMATE – New Facility on a “Greenfield” Site

Cost Per Breakout	
Construction	\$ 6,916,047
Professional Costs	\$ 805,345
Technology and Equipment	\$ 2,006,800
Contingency	<u>\$ 972,819</u>
Total Conceptual Project Budget	\$10,701,011

Separate worksheets are provided on the following pages describing:

- Overall Project Budget Worksheets for Scenario #1
- Overall Project budget Worksheets for Scenario #2

RIVERCOM 9-1-1

Wenatchee, Washington

SCENARIO #1 - Renovations and Expansion within Current Facility

CONCEPT BUDGET COST ANALYSIS

Date: 2/1/2019 Updated 5/06/19

Project Phase: Feasibility Study

CONSTRUCTION AREAS

Existing Floor Plate Utilized by RiverCom 9-1-1	6,940 s.f.
Expansion Floor Plate Area	1,000 s.f.
Alteration of Existing Floor Plate	650 s.f.
Total Construction Area	7,940 s.f.

*Note, total subtracts alterations from existing

TOTAL CONSTRUCTION COSTS

	cost/s.f.	area	total
1 RENOVATIONS TO EXISTING FACILITY <i>From Section 2 - Existing Facility</i>	\$142	6,290 s.f.	\$ 891,853
2 EXPANSION FLOOR PLATE <i>From attached Budget Worksheet</i>	\$108	1,000 s.f.	\$ 108,323
3 ALTERATIONS OF EXISTING <i>From Attached Budget Worksheet</i>	\$108	650 s.f.	\$ 70,410
4 TOTAL RENOVATION AND EXPANSION BUDGET	\$135	7,940 s.f.	\$ 1,070,586

PROFESSIONAL COSTS

5	Programming and Needs Assessment (already completed)	NA	
6	A/E Design Fee	\$ 74,941	
7	Expenses	\$ 10,000	
8	Technology Consultant	\$ -	
9	Other Discipline Consulting	\$ -	
10	Construction Manager	\$ 32,118	
11	Geotechnical Investigation	\$ -	
12	Land Survey Services	\$ -	
13	Inspection / Testing Services	\$ 5,353	
14	Commissioning	\$ 10,706	
15	Land Development Approvals	NA	
16	Total Design Services		\$ 133,117

TECHNOLOGY & EQUIPMENT					
Communications					
17	Radio Systems			\$	500,000
18	CAD			\$	300,000
19	Telephony (9-1-1 and Admin)			\$	500,000
20	Recorder			\$	65,000
21	DAS			\$	75,000
22	Net Clock			\$	12,000
23	IT (Hardware and Connectivity)			\$	85,000
24	AV			\$	9,000
25		Subtotal		\$	1,546,000
Other Systems					
26	In Building Communications			\$	50,000
27	Off-Site Electrical/Telecomm Utility Connection			\$	-
28	Ancillary Computer Equipment for entire building			\$	140,000
29	Other			\$	-
30		Subtotal		\$	190,000
Other Costs					
31	Furniture (for 8 new offices and workstations)			\$	32,000
32		Subtotal		\$	32,000
33	TOTAL TECHNOLOGY AND EQUIPMENT ESTIMATE			*	\$ 1,768,000
34		escalation @	5%		\$ 88,400.00
35		Tech & Equip Contingency @	10%		\$ 100,000
36	Total Technology Costs				\$ 1,956,400
TOTALS					
37	Project Contingency	@	10%	\$	316,010
38	TOTAL PROJECT BUDGET				\$ 3,476,113

EXPANSION FLOOR PLATE

TOTAL CONSTRUCTION COSTS

Division			cost/s.f.	area	total
Div 01	General Conditions		\$18.00	1,000 s.f.	\$ 18,000
Div 02	Existing Conditions		\$5.00	0 s.f.	\$ -
Div 03	Concrete		\$0.00	0 s.f.	\$ -
Div 04	Masonry		\$3.00	0 s.f.	\$ -
Div 05	Metals		\$3.00	1,000 s.f.	\$ 3,000
Div 06	Wood, Plastics, Composites		\$3.00	1,000 s.f.	\$ 3,000
Div 07	Thermal and Moisture Protection		\$2.00	0 s.f.	\$ -
Div 08	Openings		\$7.00	1,000 s.f.	\$ 7,000
Div 09	Finishes		\$10.00	1,000 s.f.	\$ 10,000
Div 10	Specialties		\$3.00	1,000 s.f.	\$ 3,000
Div 11	Equipment		\$0.00	1,000 s.f.	\$ -
Div 12	Furnishings		\$0.00	1,000 s.f.	\$ -
Div 13	Special Construction		\$0.00	1,000 s.f.	\$ -
Div 14	Conveying Equipment		\$0.00	1,000 s.f.	\$ -
Div 21	Fire Suppression		\$3.00	1,000 s.f.	\$ 3,000
Div 22	Plumbing		\$0.00	1,000 s.f.	\$ -
Div 23	HVAC		\$10.00	1,000 s.f.	\$ 10,000
Div 25	Integrated Automation		\$3.00	1,000 s.f.	\$ 3,000
Div 26	Electrical		\$18.00	1,000 s.f.	\$ 18,000
Div 27	Communications		\$4.50	1,000 s.f.	\$ 4,500
Div 28	Electronic Safety and Security		\$1.50	1,000 s.f.	\$ 1,500
Div 31	Earthwork		\$0.00	0 s.f.	\$ -
Div 32	Exterior improvements		\$0.00	0 s.f.	\$ -
Div 33	Utilities		\$0.00	0 LS	\$ -
				Subtotal	\$ 84,000
				OH&P 10%	\$ 8,400
				Subtotal	\$ 92,400
				Bond 1.5%	\$ 1,386
				Subtotal	\$ 93,786
				Design Contingency 10%	\$ 9,379
				Subtotal	\$ 103,165
				Escalation to mid point - December 2020 5%	\$ 5,158
Total Expansion Construction Cost Estimate			\$108.32 s.f.	\$	108,323

ALTERATIONS OF EXISTING TOTAL CONSTRUCTION COSTS

Division	cost/s.f.	area	total
Div 01 General Conditions	\$18.00	650 s.f.	\$ 11,700
Div 02 Existing Conditions	\$5.00	0 s.f.	\$ -
Div 03 Concrete	\$0.00	0 s.f.	\$ -
Div 04 Masonry	\$3.00	0 s.f.	\$ -
Div 05 Metals	\$3.00	650 s.f.	\$ 1,950
Div 06 Wood, Plastics, Composites	\$3.00	650 s.f.	\$ 1,950
Div 07 Thermal and Moisture Protection	\$2.00	0 s.f.	\$ -
Div 08 Openings	\$7.00	650 s.f.	\$ 4,550
Div 09 Finishes	\$10.00	650 s.f.	\$ 6,500
Div 10 Specialties	\$3.00	650 s.f.	\$ 1,950
Div 11 Equipment	\$0.00	0 s.f.	\$ -
Div 12 Furnishings	\$0.00	0 s.f.	\$ -
Div 13 Special Construction	\$0.00	0 s.f.	\$ -
Div 14 Conveying Equipment	\$0.00	0 s.f.	\$ -
Div 21 Fire Suppression	\$3.00	650 s.f.	\$ 1,950
Div 22 Plumbing	\$0.00	0 s.f.	\$ -
Div 23 HVAC	\$10.00	650 s.f.	\$ 6,500
Div 25 Integrated Automation	\$3.00	650 s.f.	\$ 1,950
Div 26 Electrical	\$18.00	650 s.f.	\$ 11,700
Div 27 Communications	\$4.50	650 s.f.	\$ 2,925
Div 28 Electronic Safety and Security	\$1.50	650 s.f.	\$ 975
Div 31 Earthwork	\$0.00	0 s.f.	\$ -
Div 32 Exterior improvements	\$0.00	0 s.f.	\$ -
Div 33 Utilities	\$0.00	0 LS	\$ -
<hr/>			
Subtotal			\$ 54,600
OH&P 10%			\$ 5,460
Subtotal			\$ 60,060
Bond 1.5%			\$ 901
Subtotal			\$ 60,961
Design Contingency 10%			\$ 6,096
Subtotal			\$ 67,057
Escalation to mid point - December 2019 5%			\$ 3,353
<hr/>			
Total Alteration Construction Cost Estimate	\$108.32 s.f.		\$ 70,410

RIVERCOM 9-1-1

Wenatchee, Washington

SCENARIO #2 - New Construction on a Greenfield Site

CONCEPT BUDGET COST ANALYSIS

Date: 2/1/2019 Updated 5/06/19

Project Phase: Feasibility Study

CONSTRUCTION AREAS

New Construction	13,747 s.f.
Total Construction Area	13,747 s.f.
Site Construction Area	43,560 s.f.

TOTAL CONSTRUCTION COSTS

	cost/s.f.	area	total
1 NEW BUILDING CONSTRUCTION	\$449	13,747 s.f.	\$ 6,169,186
2 SITE CONSTRUCTION	\$17	43,560 s.f.	\$ 746,860
3 TOTAL CONSTRUCTION BUDGET (\$ per s.f. of Building)	\$503	13,747 s.f.	\$ 6,916,046

PROFESSIONAL COSTS

4	Programming and Needs Assessment (already completed)	NA	
5	A/E Design Fee	\$ 484,123	
6	Expenses	\$ 10,000	
7	Technology Consultant	\$ -	
8	Other Discipline Consulting	\$ -	RiverCom 9-1-1
9	Construction Manager	\$ 207,481	
10	Geotechnical Investigation	\$ -	
11	Land Survey Services	\$ -	
12	Inspection / Testing Services	\$ 34,580	
13	Commissioning	\$ 69,160	
14	Land Development Approvals	NA	
15	Total Design Services		\$ 805,345

TECHNOLOGY & EQUIPMENT					
Communications					
16	Radio Systems			\$ 500,000	
17	CAD			\$ 300,000	
18	Telephony (9-1-1 and Admin)			\$ 500,000	
19	Recorder			\$ 65,000	
20	DAS			\$ 75,000	
21	Net Clock			\$ 12,000	
22	IT (Hardware and Connectivity)			\$ 85,000	
23	AV			\$ 9,000	
24		Subtotal		\$ 1,546,000	
Other Systems					
25	In Building Communications			\$ 50,000	
26	Off-Site Electrical/Telecomm Utility Connection			\$ -	
27	Ancillary Computer Equipment for entire building			\$ 140,000	
28	Other			\$ -	
29		Subtotal		\$ 190,000	
Other Costs					
30	Furniture (for 8 new offices and workstations)			\$ 80,000	
31		Subtotal		\$ 80,000	
32	TOTAL TECHNOLOGY AND EQUIPMENT ESTIMATE				* \$ 1,816,000
33		escalation @	5%		\$ 90,800
34		Tech & Equip Contingency @	10%		\$ 100,000
35	Total Technology Costs				\$ 2,006,800

TOTALS					
36	Project Contingency	@	10%	Subtotal \$ 972,819	\$ 9,728,192
37	TOTAL PROJECT BUDGET				\$ 10,701,011

NEW BUILDING CONSTRUCTION

TOTAL CONSTRUCTION COSTS

Division			cost/s.f.	area	total
Div 01	General Conditions		\$18.00	13,747 s.f.	\$ 247,446
Div 02	Existing Conditions		\$5.00	13,747 s.f.	\$ 68,735
Div 03	Concrete		\$10.00	13,747 s.f.	\$ 137,470
Div 04	Masonry		\$15.00	13,747 s.f.	\$ 206,205
Div 05	Metals		\$20.00	13,747 s.f.	\$ 274,940
Div 06	Wood, Plastics, Composites		\$3.00	13,747 s.f.	\$ 41,241
Div 07	Thermal and Moisture Protection		\$30.00	13,747 s.f.	\$ 412,410
Div 08	Openings		\$20.00	13,747 s.f.	\$ 274,940
Div 09	Finishes		\$30.00	13,747 s.f.	\$ 412,410
Div 10	Specialties		\$15.00	13,747 s.f.	\$ 206,205
Div 11	Equipment		\$2.00	13,747 s.f.	\$ 27,494
Div 12	Furnishings		\$0.00	13,747 s.f.	\$ -
Div 13	Special Construction		\$10.00	13,747 s.f.	\$ 137,470
Div 14	Conveying Equipment		\$0.00	13,747 s.f.	\$ -
Div 21	Fire Suppression		\$10.00	13,747 s.f.	\$ 137,470
Div 22	Plumbing		\$9.00	13,747 s.f.	\$ 123,723
Div 23	HVAC		\$55.00	13,747 s.f.	\$ 756,085
Div 25	Integrated Automation		\$4.00	13,747 s.f.	\$ 54,988
Div 26	Electrical		\$80.00	13,747 s.f.	\$ 1,099,760
Div 27	Communications		\$10.00	13,747 s.f.	\$ 137,470
Div 28	Electronic Safety and Security		\$2.00	13,747 s.f.	\$ 27,494
Div 31	Earthwork		\$0.00	0 s.f.	\$ -
Div 32	Exterior improvements		\$0.00	0 s.f.	\$ -
Div 33	Utilities		\$0.00	0 LS	\$ -
				Subtotal	\$ 4,783,956
				OH&P 10%	\$ 478,396
				Subtotal	\$ 5,262,352
				Bond 1.5%	\$ 78,935
				Subtotal	\$ 5,341,287
				Design Contingency 10%	\$ 534,129
				Subtotal	\$ 5,875,416
				Escalation to mid point - December 2020 5%	\$ 293,771
Total Building Construction Cost Estimate			\$448.77 s.f.		\$ 6,169,186

SITE CONSTRUCTION

TOTAL CONSTRUCTION COSTS

Division			cost/s.f.	area	total
Div 01	General Conditions		\$2.00	43,560 s.f.	\$ 87,120
Div 02	Existing Conditions		\$0.00	0 s.f.	\$ -
Div 03	Concrete		\$0.00	0 s.f.	\$ -
Div 04	Masonry		\$0.00	0 s.f.	\$ -
Div 05	Metals		\$0.00	0 s.f.	\$ -
Div 06	Wood, Plastics, Composites		\$0.00	0 s.f.	\$ -
Div 07	Thermal and Moisture Protection		\$0.00	0 s.f.	\$ -
Div 08	Openings		\$0.00	0 s.f.	\$ -
Div 09	Finishes		\$0.00	0 s.f.	\$ -
Div 10	Specialties		\$0.00	0 s.f.	\$ -
Div 11	Equipment		\$0.00	0 s.f.	\$ -
Div 12	Furnishings		\$0.00	0 s.f.	\$ -
Div 13	Special Construction		\$0.00	0 s.f.	\$ -
Div 14	Conveying Equipment		\$0.00	0 s.f.	\$ -
Div 21	Fire Suppression		\$0.00	0 s.f.	\$ -
Div 22	Plumbing		\$0.00	0 s.f.	\$ -
Div 23	HVAC		\$0.00	0 s.f.	\$ -
Div 25	Integrated Automation		\$0.00	0 s.f.	\$ -
Div 26	Electrical		\$0.00	0 s.f.	\$ -
Div 27	Communications		\$0.00	0 s.f.	\$ -
Div 28	Electronic Safety and Security		\$0.00	0 s.f.	\$ -
Div 31	Earthwork		\$3.00	43,560 s.f.	\$ 130,680
Div 32	Exterior improvements		\$6.00	43,560 s.f.	\$ 261,360
Div 33	Utilities		\$100,000.00	1 LS	\$ 100,000
					Subtotal \$ 579,160
					OH&P 10% \$ 57,916
					Subtotal \$ 637,076
					Bond 1.5% \$ 9,556
					Subtotal \$ 646,632
					Design Contingency 10% \$ 64,663
					Subtotal \$ 711,295
					Escalation to mid point - December 2019 5% \$ 35,565
Total Site Construction Cost Estimate			\$17.15 s.f.		\$ 746,860

APPENDIX

INTRODUCTION

This section contains additional information to support the work conducted during the process. While additional information was distributed at the workshop session in November, the attached provides a reasonable summary.

The Workshop Sessions were held on November 28 and 29, 2018 on site. The agenda for those workshops is included in the pages to follow as are the Meeting Minutes from those activities. There were additional skype meetings between planning team members. Formal meeting minutes were not kept for those although the work product is included in this document.

SCHRADERGROUP

MEETING MINUTES

Kick-off and Programming

CLIENT: RiverCom

PROJECT: Facility Assessment and Feasibility Study

LOCATION: 140 S. Mission St. Wenatchee, Washington.

MEETING DATE: 11.28-29.2018 (Issued 12.06.2018)

ATTENDEES 11.28:	Jim Fosse	RiverCom	JF
	Misty Viebrock	RiverCom	MV
	Josh Humphrey	RiverCom	JH
	Jerry Corder	RiverCom	JC
	Criselia Grupp	RiverCom	CG
	Molly Elliott	RiverCom	ME
	Jason Ayers	RiverCom	JA
	Jerrilea Crawford	Board Member	JC
	Keith Huffaker	Board Member	KH
	David Schrader	SCHRADERGROUP (SG)	DS
	Kelly Ryan	SCHRADERGROUP (SG)	KR

ADDITIONAL ATTENDEES 11.29:	Brian Harris	TCA Architecture + Planning	BH
	Michael Case	Case Engineering	MC
	James Whigham	Sider + Byers Mechanical Engineers	JW

ATTACHMENTS: Agenda, DRAFT Architectural Program, DRAFT Threat Assessment

This 2-day meeting was held to kick-off the project to perform a planning and facility assessment. Activities and conversation were as follows:

November 28, 2018, 9:00am – 4:00pm

1.01 Existing Emergency Communication Center Tour Observations and Discussion. The group toured the facility with comments from staff on the following:

1.01.1 Training – Training for Emergency Services Dispatchers currently occurs in the small conference room, which displaces regularly scheduled meetings and is disconnected from the main Dispatch floor. The Training Academy serves 1-4 students at a time. Training for incumbent Dispatchers is at their current work stations, but RiverCom would like to include space for them in a new training area.

- 1.01.2 Dispatch – Currently, there are (11) Workstations, (1) Supervisor Office with (3) Supervisor workstations. Dispatch workstations are undersized at 6' x 6'. Text to 9-1-1 will require one additional PC and monitor. RiverCom has considered 2 tier monitors, but they are not ideal for ergonomics. Watson Consoles provided an alternate workstation configuration, which has more workstations at approximately 8'-0" x 6'-10". Current space does not have an elevated supervisor workstation, which makes their job difficult. Calls are frequently interrupted by noise of adjacent Police Department fitness room, vacuuming, and rain against roof. HVAC is inconsistent, creating hot and cold zones in same room and units are loud. Space is not hardened per ICC 500. Roller Shades are manual and difficult to reach; wish for motorized shades. Many overhead light fixtures are covered with paper shields due to occupant light sensitivity and glare on screens. There is also difficulty maneuvering around behind the workstations to service them and to control the blinds.
- 1.01.3 Equipment Room – Square footage/ rack space is adequate for current and potentially for 20-year growth. Room is equipped with pre-action fire sprinkler system. There appears to be a redundant HVAC system to the room. R56 grounding is missing. Space is not hardened per ICC 500.
- 1.01.4 Break Room – Space is also serving as quiet room and locker room. NENA may recommend a separate quiet room space. Room does not have cooking appliances nor a dishwasher. The refrigerator is too small. There is no (working) exhaust system.
- 1.01.5 Offices – Generally are good. Square footage is larger than standard. GIS workstation and plotter are located in Workroom 329. An IT office is located in existing Lockers 330. The Radio Systems office is located in existing storage/future 339.
- 1.01.6 Bathrooms/ Showers – Toilet room exhaust system is not functioning. There is not adequate storage space for employee self-care items. RiverCom does not have access to a shower.
- 1.01.7 Storage – RiverCom has approximately 16,000 SF of offsite storage. They would like on-site storage for annual records and supplies.
- 1.01.8 Security – RiverCom does not have control over building keycard programming and can only access the building from one exterior door. There is concern that building access could be cut off if protestors or other activity surround the Police Station. Previous incidents also include knocked out windows and pepper spray. Parking is shared with PD so there is concern for employee cars being mistakenly targeted. When the AC is on, the resultant pressure does not allow the exterior door to close without assistance, thus creating a security breach.
- 1.01.9 Other –
 - 1.01.9.1 Janitor Closet - RiverCom does not have access to a janitor closet. They share services with PD. Janitors must be CJIS approved.
 - 1.01.9.2 Lactation Room is shared with Storage and does not have running water nor refrigeration.
 - 1.01.9.3 Fitness – Employees do not have access to fitness facilities, which creates sedentary lifestyle and lack of morale.
- 1.02 Project Vision – The group met to review concerns with the current facility and goals for the next generation of this facility.
 - 1.02.1 Design a state of the art facility to serve Chelan and Douglas counties for expected growth over the next 20-years.
 - 1.02.2 Organize operations efficiently and determine if all parties should remain under one roof or can be separated in some way.

- 1.02.3 Provide an environment to support and uplift employees with high stress jobs and traditionally low morale.
- 1.02.4 Consider opportunities for alternative power including solar.
- 1.03 State of the Art 9-1-1 Facility Discussion
 - 1.03.1 Current critical spaces are not hardened, and the dispatch workstations are small, but in general the current facility is up to date with technology.
 - 1.03.2 SG presented a state of the art presentation on Communication Facilities. Among the design trend items that ReiverCom staff hopes to see in the next generation of this facility are:
 - 1.03.2.1 White noise analysis
 - 1.03.2.2 Equipment rooms utilizing enclosed cabinets in lieu of open-frame racks. Cabinets however require more square footage.
 - 1.03.2.3 Training Rooms adjacent and flexible to expand to Dispatch floor to function potentially as overflow.
 - 1.03.2.4 No more locker rooms and instead include individual toilet/ shower rooms. Locate personal lockers (24" x 24" x 30") in corridors.
 - 1.03.2.5 In urban settings where standoff distance is not achievable, design to avoid progressive structural collapse.
 - 1.03.2.6 Include ballistic glazing to 7' high to protect people and reduce cost.
- 1.04 Architectural Programming – SCHRADERGROUP conducted a programming exercise (DRAFT results attached). The team identified all portions of the facility and current and future spaces to accommodate their needs.
 - 1.04.1 RiverCom identified the (5) following program sectors: Administration, Operations, Training, Technology, Common Spaces.
 - 1.04.2 The following spaces were added to the existing program:
 - 1.04.2.1 Admin – Filing, HR Manager, IT Asset Storage, QA/QI Manager, Public Disclosure Officer, Storage, unisex Toilet Room
 - 1.04.2.2 Operations – Supervisor office, (3) workstations, printer/ scanner/ copy, storage/ supplies.
 - 1.04.2.3 Training – Console Training Area, Manager Office, Storage
 - 1.04.2.4 Technology – UPS, workbench
 - 1.04.2.5 Common Space – Dining area, Quiet room, Toilet Room with Showers, Lactation Room, Fitness Room, Storage. The following are also additions if building new: secure vestibule, lobby/ waiting, unisex toilet room, back of house building systems
 - 1.04.3 See attachment for draft program analysis. Final assessment will be included in the final Facility Assessment and Feasibility Study Report.

November 29, 2018 9:00 am – 1:00pm

- 2.01 Facility Assessment
 - 2.01.1 Architecture, Mechanical/ Plumbing and Electrical consultants conducted a facility assessment. The results will be summarized in the final Facility Assessment and Feasibility Study Report.
- 2.02 Threat Assessment

- 2.02.1 RiverCom, SG and all consultants conducted the beginnings of a threat assessment; See attached for DRAFT. Final assessment will be included in the final Facility Assessment and Feasibility Study Report.
- 2.03 Other
 - 2.03.1 The next meeting will be scheduled as the report develops.
 - 2.03.2 A tentative date for a DRAFT presentation is scheduled for the monthly Board Meeting on Wednesday, February 13th.

These minutes are the writers' summary and interpretation of the business transpired at this meeting. Unless the writer is advised within ten (10) days of receipt, via letter, we shall assume agreement with the content.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Kelly Ryan". The signature is stylized with a large, looped "K" and a cursive "Ryan".

Kelly Ryan
SCHRADERGROUP

Cc: All attendees, Larry Bickford

MEETING AGENDA

PROJECT:	Communications Center – Programming/Planning and Feasibility Study
CLIENT:	RiverCom 9-1-1
MEETING DATES:	November 28 and 29, 2018
MEETING TIMES:	November 28 9:00 AM – 4:30 PM November 29 9:00 AM – 11:30 AM
MEETING TOPIC:	Kick-off, Planning and Facility Assessment Workshop

November 28 9:00 AM to 4:30 PM

9:00 AM – 9:30 AM RIVERCOM EMERGENCY COMMUNICATION CENTER TOUR

<i>Facilitators:</i>	RiverCom 9-1-1
<i>Participants:</i>	RiverCom 9-1-1, SGA Team
<i>Objective:</i>	To understand how the existing RiverCom Emergency Communications Center currently functions
<i>Process:</i>	Team members will tour the existing Emergency Communications Center to understand how the facilities currently function. RiverCom personnel will also describe how the operation may be altered if the space were adapted. The team will also look at technology to understand how it currently fits into the facility and will evaluate the space it may require in a new/renovated facility.

9:30 AM – 10:00 AM TEAM INTRODUCTIONS/ PROJECT VISION

<i>Participants:</i>	RiverCom 9-1-1, SGA Team
<i>Objective:</i>	Welcome to the entire team. Introduction of the Process
<i>Process:</i>	Introductions of all. Introduction by SGA of the overall process for the day. Development of a shared vision for the project.

10:00 AM – 11:00 AM STATE OF THE ART 9-1-1 FACILITY DISCUSSION

<i>Facilitators:</i>	SGA
<i>Participants:</i>	RiverCom 9-1-1, SGA Team
<i>Objective:</i>	To create a shared perspective of state-of-the-art Emergency Communications Facilities
<i>Process:</i>	SGA will provide a presentation of state-of-the-art Emergency Communications Facilities and will lead the team in a discussion of the architectural elements of those facilities.

11:00 AM – 1:00 PM ARCHITECTURAL PROGRAMMING

<i>Facilitators:</i>	SGA
<i>Participants:</i>	RiverCom 9-1-1, SGA Team
<i>Objective:</i>	To develop the architectural program which will be used to further develop the Feasibility Study.

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Process: SGA will lead a process with RiverCom 9-1-1 Personnel to further understand the various programmatic needs of the facility. The team will also discuss overall technology needs and the spaces potentially needed for the various building systems.

1:00 PM – 2:00 PM **LUNCH**

2:00 PM – 3:00 PM **THREAT ASSESSMENT**

Facilitators: SGA Team

Participants: RiverCom 9-1-1, SGA Team

Objective: To develop a threat assessment consistent with the requirements of FEMA-361

Process: SGA will lead the team in an interactive process to complete a threat assessment for the proposed site consistent with the requirements of FEMA-361.

3:00 PM – 3:30 PM **NEXT STEPS**

Facilitators: SGA

Participants: RiverCom 9-1-1, MCP, SGA Team

Objective: To develop a unified vision of how the project will proceed from this point on

Process: The SGA team will lead everyone in a final discussion of what must happen next in order to make the project occur. A project schedule will be shared and discussed. Team members will share thoughts, comments and concerns to develop this shared vision for the project.

3:30 PM – 4:30 PM **TOUR OF PROPOSED SITE** *Only if an additional site is chosen to view*

Facilitators: RiverCom 9-1-1

Participants: RiverCom 9-1-1, SGA Team

Objective: To develop a shared understanding of the proposed site

Process: Team members will tour the proposed site to understand all site related issues.

November 29 9:00 AM to 11:30 AM

9:00 AM – 11:30 AM **FACILITY ASSESSMENT**

Facilitators: SGA Team

Participants: RiverCom 9-1-1, SGA Team

Objective: To compile information enough for the facility assessment

Process: The SGA team will conduct a walk-through of the facility and systems with the engineering team to complete a facility assessment.

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