BENJAMIN F. DAWSON, PE THOMAS M. ECKELS, PE STEPHEN S. LOCKWOOD, PE DAVID J. PINION, PE ERIK C. SWANSON, PE

THOMAS S. GORTON, PE MICHAEL H. MEHIGAN, EIT HATFIELD & DAWSON CONSULTING ELECTRICAL ENGINEERS 9500 GREENWOOD AVE. N. SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151 FACSIMILE (206) 789-9834 E-MAIL hatdaw@hatdaw.com

> JAMES B. HATFIELD, PE CONSULTANT

Maury L. Hatfield, PE (1942-2009) Paul W. Leonard, PE (1925-2011)

## COST ESTIMATE FOR A NEW PROJECT 25 PHASE 2 RADIO SYSTEM

## KING COUNTY, WASHINGTON

## JANUARY 13, 2012

## PREPARED BY:

## HATFEILD & DAWSON CONSULTING ENGINEERS NORTHWEST TOWER ENGINEERING MICHAEL AIPPERSBACH AND ASSOCIATES CSI TELECOMMUNICATIONS

# KING COUNTY P25 PHASE 2 800 MHz RADIO SYSTEM COST ESTIMATE01/13/12INTRODUCTION

This detailed cost estimate contained in the spreadsheets and supporting documents described below is intended to provide a complete estimate of the cost of replacing the existing King County 800 MHz Radio System with a new Project 25 Phase 2 (2-slot TDMA) digital trunked radio system. The new system would be designed to provide a significantly higher level of coverage than the existing King County Radio System over the urbanized area of the County west of the Cascade foothills and over the main east-west transportation corridors leading into and out of King County (SR 2, I-90, and SR 410). The system is assumed to be configured with dual redundant, geographically separated master sites and would operate with multiple simulcast cells, each consisting of multiple base station repeater sites.

The cost estimate also includes costs for a UHF P25 Phase 2 subsystem and a VHF P25 Phase 2 subsystem, each with two channels, which provide the same level of coverage as the 800 MHz radio system over the urbanized portion of King County and along the transportation corridors described above. These systems will also provide coverage in the mountains in the eastern portion of King County for wildfire and search and rescue operations.

The cost of a complete interconnect system using microwave radios is also included in the estimate.

The cost estimate includes costs for replacement of all 800 MHz existing subscriber equipment and dispatch centers now used on the existing radio system. A small subset of the subscriber units are multi-band radios capable of operating on the VHF and UHF sub-systems as well as the 800 MHz radio system.

Because the cost estimate assumes complete replacement of the radio system site infrastructure and subscriber units in the existing system, it is applicable to an "upgrade" of the existing Motorola radio system or to a complete replacement of that system by a new system selected via a competitive procurement process.

## COST ESTIMATE SPREADSHEETS AND SUPPORTING DOCUMENTS

The detailed cost estimate is contained in five separate spreadsheet documents which are tied together in a summary spreadsheet that shows total costs for each system cost component. A separate spreadsheet and a separate text document show the assumptions underlying the various components of the cost estimate. A brief description of each of these spreadsheets and supporting documents is shown below.

## SUMMARY SPREADSHEET

## Sheet 1 - King County P25 Radio System Cost Estimate Summary Sheet

This spreadsheet shows the total costs for equipment and installation of the following radio system components:

- Repeater Site Equipment (Radio and Backup Power Systems)
- Master Site Equipment (Radio and Backup Power Systems)
- Simulcast Prime Site Equipment (Radio and Backup Power Systems)
- Dispatch Center Equipment (Radio Equipment Only)
- Subscriber Equipment (Equipment, Installation and Programming)

The summary spreadsheet also shows total costs for site infrastructure (buildings, towers, backup generators, etc.) and permitting costs associated with the development of new sites.

A separate section shows the system support and "soft" costs associated with the implementation of the new radio system.

The final line item in the Cost Estimate Summary Sheet is the total cost of the radio system, which is the sum of all of the cost components listed above.

Total System and Subscriber Equipment,	
Installation and Site Infrastructure Costs	\$288,140,000
System Support and Soft Costs	<u>\$ 88,050,000</u>
Total System Cost	\$376,190,000

## SUPPORTING SPREADSHEETS

Sheet 2 - King County P25 Radio System Site Infrastructure Costs

This spreadsheet shows the costs associated with the development of new repeater sites and with the replacement of towers and/or equipment shelters at existing sites. The site development costs are based on six different site scenarios, as described below:

- 1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Added equipment racks and equipment to tower.
- 2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Added equipment racks and equipment to tower.
- 3. (Lowland site) All new King County site compound: (50' x 50') new shelter (10' x 25'), backup power and tower 180ft self-supporting tower.
- 4. (High site) All new King County site compound: (50' x 50') new shelter (10' x 25'), backup power and tower 180ft self-supporting tower, road work required.

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- 4. (High site) All new King County site compound: (50' x 50') new shelter (10' x 25'), backup power and tower 180ft self-supporting tower, road work required.
- 5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower.
- 6. Existing King County site: reuse existing shelter, backup power, demolish existing tower and add new 180ft self-supporting tower. Add equipment racks and equipment to tower.

The existing sites in the King County 800 MHz Radio System were analyzed and assigned to one of the six scenarios shown above. New sites were assumed to be covered by scenarios 3 and 4, with 4 new sites assumed to be high sites and 24 new sites assumed to be lowland sites. Thirteen of the existing King County sites were assumed to require complete replacement (new equipment shelter and new tower) under scenario 3. Site data for the existing sites is shown in the "Master Site Information" worksheet at the front of the spreadsheet.

For sites covered by scenarios 3, 4, 5 and 6 we made the assumption that the ground space required for these sites would be leased rather than purchased. For new high sites outside of the urbanized area west of the Cascade foothills, it is very likely that new sites would be on leased land, and in the urbanized area of King County there are likely to be difficulties purchasing the small (50' X 50') plots required for new sites, and leasing a section of a larger piece of property is more likely. Lease costs included in the cost estimate for scenarios 3, 4, and 5 are based on an assumed monthly lease of \$2100, with an annual cost increase of 3% over 7 years (the assumed build-out period for the new system). This cost has been converted to a Net Present Value ("NPV") with an assumed annual rate of return of 3% on the initial value shown in the worksheets, which represents the "up-front" dollars that would need to be invested at the beginning of the project to cover the lease costs over the 7-year period at the assumed interest rate. For scenario 6 (new tower only), the assumed monthly lease is assumed to be \$1050 which is half the amount assumed for scenarios 3, 4 and 5. The details of the NPV calculations are shown in Sheet 6, as described below.

The coverage requirements for the new P25 Phase 2 radios system are defined as follows:

- 1. 97% Service Area Reliability coverage in the bounded area of King County. The bounded area includes the entire geography of each county west of the Cascade Mountain foothill boundary, all cities, and all major roadways. The foothill boundary is defined here as the first topographic contour that exceeds 750 feet of elevation as one travels eastward from Puget Sound.
- 2. 97% Service Area Reliability coverage in each city within King County (all cities are to be included within the identified bounded areas).
- 3. The Service Area Reliability shown above assumes operation with belt-level portable radios.

A total of 28 new repeater sites was assumed for the cost estimate. The number of new sites required was based on an analysis of 97% reliability coverage for belt-level portable 800 MHz radios from the existing sites. The assumed loss relative to a half-wave dipole used in the site requirements analysis shown below is -14.3 dB, which is the loss figure used in other coverage maps produced by other consultants for King County.

The average distance from existing sites to the edge of the 97% belt-level coverage from the existing sites was determined using the coverage prediction maps showing the existing sites, and the new sites were assumed to provide the same coverage radius. New sites were then added throughout the areas of urbanized King County and in the transportation corridors in the eastern part of the County that did not have predicted coverage at the 97% level for belt-level portable radios. This analysis resulted in a total of 56 sites, with 28 of those sites being the existing sites in the King County 800 MHz Radio, and the other 28 sites being new sites.

Following the Master Site Information worksheet is a sheet titled "Overview Total Cost". This sheet shows the costs associated with each scenario, broken down by cost category, as well as the total overall cost for site infrastructure and site development.

The worksheets following the Overall Total Cost worksheet show the site infrastructure costs and the costs associated with site development (permitting, etc.) for each scenario.

## Total Site Infrastructure and Site Development Cost\$55,180,000

## Sheet 3 - King County P25 Radio System Site Equipment Cost Estimate

Sheet 3 contains the cost estimate for fixed site equipment for the new radio system, including base station repeaters and associated equipment, network equipment at remote repeater sites, battery backup power systems, P25 master site equipment, and simulcast prime sites for the simulcast subsystems in the new radio system.

The cost estimate assumes at total of 56 repeater sites (as described above), 2 P25 master sites (dual-redundant and geographically separate), and 9 simulcast prime sites.

For purposes of the cost estimate, the portion of the radio system in the urbanized part of King County (west of the Cascade foothills) is assumed to have 4 simulcast subsystems. The 800 MHz subsystem in the transportation corridors is assumed to have 3 simulcast subsystems. The VHF and UHF sub-systems in the transportation corridors are assumed to use a single simulcast subsystem. Therefore, a total of 8 simulcast prime sites is assumed for purposes of the cost estimate. The actual configuration of these subsystems, other than the number of prime sites, is not critical for purposes of estimating costs.

Following the sheet titled "Site Totals" which shows the sub-totals for master sites, simulcast prime sites, and repeater sites, as well as the site equipment and installation total for all sites, there are additional worksheets showing the site equipment costs for each type of site assumed in the cost estimate. These worksheets are described below:

- 1. Master This worksheet shows the individual line items and the total equipment cost for each P25 master site, and the number of sites assumed for each category.
- 2. Prime 800 This worksheet shows the individual line items and the total equipment cost for each urbanized area 800 MHz simulcast prime site.
- 3. Prime 800 Hwys This worksheet shows the individual line items and the total equipment cost for the transportation corridor 800 MHz simulcast prime site.
- 4. Prime VHF This worksheet shows the individual line items and the total equipment cost for each VHF simulcast prime site.
- 5. Prime UHF This worksheet shows the individual line items and the total equipment cost for each UHF simulcast prime site. (The costs for the VHF and UHF prime sites are identical, and the cost estimate assumes that the VHF and UHF simulcast systems will use the same sites and share the same prime site.)
- 6. Trunking 800 This worksheet shows the individual line items and the total equipment cost for each urbanized area 800 MHz simulcast base station repeater site.
- Trunking 800\_VHF\_UHF This worksheet shows the individual line items and the total equipment cost for each urbanized area 800 MHz simulcast base station repeater site which also has VHF and UHF base stations that are part of the VHF/UHF simulcast subsystems.
- 8. Trunking 800\_VHF\_UHF Hwys This worksheet shows the individual line items and the total equipment cost for each transportation corridor 800 MHz simulcast base station repeater site which also has VHF and UHF base stations that are part of the VHF/UHF simulcast sub-systems.

The unit costs shown in the worksheets are based on list prices (or on discounted prices with system discounts removed) obtained from system contracts and proposals for Motorola P25 radio systems similar to the proposed King County P25 Phase 2 Radio System, from distributors' list pricing (e.g. Tessco and/or Hutton) for non-proprietary system components such as transmission lines and antennas, or from manufacturer's quotations for comparable equipment (e.g. for rectifier and battery sub-systems).

We were not able to obtain unit pricing information for all of the hardware, firmware, and software items listed in the master site workbook, so we have added a line item at the end of the equipment list for the master site to account for the items shown in the list for which we do not have reliable unit pricing. The adjustment factor shown at the end of the master site equipment list is based on the estimated cost for a redundant master site similar to the master site assumed

for the King County system obtained during discussions with system owners who are implementing or are about to implement Motorola P25 Phase 2 systems.

Prime sites are assumed to be configured with the "high availability" option, which provides a higher number of available channels in the event of a switch failure at the prime site than the standard configuration.

Urbanized area simulcast sites are assumed to have 28 800 MHz base stations (24 base stations repeaters for voice channel use, and 4 base stations used for redundant control channels). Existing IntelliRepeater stand-alone sites in the existing King County 800 MHz radio system are assumed to be full 28 channel simulcast sites in the new system.

Urbanized area simulcast repeater sites with VHF and UHF sub-systems are assumed to have 28 800 MHz base stations (24 base stations repeaters for voice channel use, and 4 base stations used for redundant control channels), plus 2 VHF and 2 UHF base station repeaters.

Transportation corridor simulcast repeater sites with 800 MHz channels only are assumed to have 8 800 MHz base stations (6 base station repeaters for voice operation and 2 base stations used for redundant control channels).

Transportation corridor simulcast repeater sites with 800 MHz, VHF and UHF channels are assumed to have 8 800 MHz base stations (6 base station repeaters for voice operation and 2 base stations used for redundant control channels), 2 VHF base station repeaters and 2 UHF base station repeaters.

A total of 10 sites with both 800 MHz and VHF/UHF base stations is assumed for purposes of this cost estimate.

The configuration of master sites, prime sites, and simulcast repeater sites assumed in the cost estimates is based on system configuration information contained in Planner and System documents for Motorola Astro 25 Integrated Voice and Data Systems, Release 7.11.

Total Site Equipment Cost\$70,180,000Total Site Equipment Installation Cost\$ 1,900,000Total Site Equipment & Installation Cost\$72,080,000

## Sheet 4 -King County P25 Radio System Dispatch System Cost Estimate

Sheet 4 contains the cost estimate data for the dispatch systems that would be part of the new P25 Phase 2 800 MHz radio system. The number of dispatch facilities and the number of dispatch positions in each facility are based on the existing dispatch facilities now used in the

various subsystems of the current King County 800 MHz Radio System and the Port of Seattle 800 MHz Radio System. The worksheets in the Dispatch System Cost Estimate spreadsheet are described below:

- <u>Summary</u> This worksheet contains a tabulation of the total quantities and costs for each equipment item used in the dispatch systems, broken out by sub-system. The total cost for dispatch equipment and installation is shown at the bottom right of the worksheet. (NOTE: the Labor and Subcontract columns in the worksheets in this spreadsheet and the subsequent worksheets are not used; the installation costs for the dispatch equipment is accounted for separately in the totals at the bottom right of the spreadsheet).
- Port of Seattle This worksheet contains a tabulation of the total quantities and costs for each equipment item used in the Port of Seattle dispatch systems, broken out by dispatch center. The total cost for Port of Seattle dispatch equipment (installation is included in the Summary worksheet) is shown at the bottom right of the worksheet.
- 3. <u>Seattle Sub-Region</u> This worksheet contains a tabulation of the total quantities and costs for each equipment item used in the City of Seattle dispatch systems, broken out by dispatch center. The total cost for City of Seattle dispatch equipment (installation is included in the Summary worksheet) is shown at the bottom right of the worksheet.
- 4. <u>King County Sub-Region</u> This worksheet contains a tabulation of the total quantities and costs for each equipment item used in the King County dispatch systems, broken out by dispatch center. The total cost for King County dispatch equipment (installation is included in the Summary worksheet) is shown at the bottom right of the worksheet.
- 5. <u>ValleyCom Sub-Region</u> This worksheet contains a tabulation of the total quantities and costs for each equipment item used in the Valley Communications dispatch systems, broken out by dispatch center. The total cost for Valley Communications dispatch equipment (installation is included in the Summary worksheet) is shown at the bottom right of the worksheet.
- 6. <u>EPSCA Sub-Region</u> This worksheet contains a tabulation of the total quantities and costs for each equipment item used in the ESPCA dispatch systems, broken out by dispatch center. The total cost for EPSCA dispatch equipment (installation is included in the Summary worksheet) is shown at the bottom right of the worksheet.

7. <u>Assumptions and Source</u> – This worksheet shows the equipment types and model numbers assumed for each line item in the cost estimate.

Total Dispatch System Equipment Cost	\$11	,610,000
Total Dispatch System Installation Cost	\$	350,000
Total Dispatch System Equipment & Installation Cost	\$11	,960,000

## Sheet 5 - King County P25 Radio System Microwave Radio Interconnect Cost Estimate

Sheet 5 contains the cost estimate for a new microwave radio interconnect system to support the King County P25 Phase 2 radio system. The worksheets contained in this spreadsheet are described below:

 <u>Microwave Radio Cost Summary</u> – This sheet contains a summary of the costs of the microwave interconnect system, broken out by type of link (loop protected or spur) and by frequency band. This sheet also contains the total microwave interconnect system equipment cost and installation cost at the bottom of the worksheet.

The cost estimate assumes: that each urban area simulcast site will have a path into the site and a path out of the site as part of a protected loop; that the transportation corridor sites will be linked back to the urban area via a daisy-chain of spur links, and each dispatch facility will have a link in and out and will be included in the simulcast system protected loop. A small number of links configured for space diversity is included in the totals, both for the loop protected links and for the spur links. Frequency bands are assumed to be primarily 11 GHz in the urbanized area and 6 GHz in the transportation corridors (the difference in cost for equipment between these bands is minimal, so the frequency band assumptions do not have a significant impact on the overall system cost estimate).

- 2. <u>Microwave Radio Costs</u> This sheet shows the estimated costs for microwave radio equipment, broken out by frequency band and link configuration.
- 3. <u>Microwave Antenna System Costs -</u> This sheet shows the estimated costs for microwave antenna equipment, broken out by frequency band and link configuration.

Microwave radio costs are based on WSCA pricing for microwave radio equipment and list prices (obtained from distributors such as Tessco or Hutton) for microwave antenna system equipment.

Total Interconnect Equipment Cost	\$8,900,000
Total Interconnect System Installation Cost	\$ 250,000
<b>Total Interconnect Equipment &amp; Installation Cost</b>	\$9,150,000

## Sheet 6 - King County P25 Radio System Subscriber Equipment Cost Estimate

Sheet 6 contains the cost estimate for subscriber equipment, broken down by radio type (mobile, portable) and by representative model number (public safety high-tier multiband, public safety high-tier single band, and non-public safety). A description of the separate worksheets in Sheet 6 is shown below:

- <u>Summary</u> This sheet shows the number of subscriber units assumed for each of the subsystems in the existing King County 800 MHz Radio System, and the Port of Seattle System, sorted by type of subscriber unit (radio). The sheet also shows the estimated cost for each radio type, as well as the estimated costs for programming and installation by radio type. The total estimated cost for subscriber units is shown at the bottom right of the worksheet.
- 2. <u>APX7500 Mobile 800, UHF, VHF</u> This sheet shows the configuration options and costs for a multiband high-tier mobile radio configured for tri-band trunked P25 Phase 2 operation (800 MHz, VHF and UHF).
- <u>APX7500 Mobile 800 & VHF or UHF</u> This sheet shows the configuration options and costs for a multiband high-tier mobile radio configured for dual-band trunked P25 Phase 2 operation (800 MHz and VHF or 800 MHz and UHF).
- 4. <u>APX7500 Mobile 800 MHz Only</u> This sheet shows the configuration options and costs for a multiband high-tier mobile radio configured for 800 MHz trunked P25 Phase 2 operation (800 MHz only).
- <u>APX6500 Mobile 800 MHz -</u> This sheet shows the configuration options and costs for a single-band high-tier mobile radio configured for trunked P25 Phase 2 800 MHz operation.
- <u>APX6500 Mobile Non-P.S. -</u> This sheet shows the configuration options and costs for a single-band high-tier non-public safety mobile radio configured for trunked P25 Phase 2 800 MHz operation. (The difference between the public safety mobile radios and the non-public safety mobile radios is that the public safety radios have encryption and Over-the-Air-Rekeying (OTAR) enabled, and the non-public safety mobile radios do not have encryption or OTAR.
- <u>APX7000 Portable 800 UHF VHF</u> This sheet shows the configuration options and costs for a multiband high-tier portable radio configured for tri-band trunked P25 Phase 2 operation (800 MHz, VHF and UHF).

- 8. <u>APX7000 Portable 800 & VHF or UHF -</u> This sheet shows the configuration options and costs for a multiband high-tier portable radio configured for dual-band trunked P25 Phase 2 operation (800 MHz and VHF or 800 MHz and UHF).
- <u>APX7000 Portable 800 MHz Only</u> This sheet shows the configuration options and costs for a multiband high-tier portable radio configured for 800 MHz trunked P25 Phase 2 operation (800 MHz only).
- 10. <u>APX6000 Portable</u> This sheet shows the configuration options and costs for a singleband high-tier portable radio configured for trunked P25 Phase 2 800 MHz operation.
- <u>APX6000 Portable Non-P.S.</u> This sheet shows the configuration options and costs for a single-band high-tier non-public safety portable radio configured for trunked P25 Phase 2 800 MHz operation. (The difference between the public safety portable radios and the non-public safety portable radios is that the public safety radios have encryption and Over-the-Air-Rekeying (OTAR) enabled, and the non-public safety portable radios do not have encryption or OTAR.)
- <u>APX4000 Portable</u> This sheet shows the configuration options and costs for a singleband low-tier (non-public safety) portable radio configured for trunked P25 Phase 2 800 MHz operation.

The unit costs shown in the worksheets are based on list prices (discounted prices with system discounts removed) obtained from system contracts and proposals for Motorola P25 radio systems similar to the proposed King County P25 Phase 2 Radio System.

Total Subscriber Equipment Cost	\$126,390,000
Total Subscriber Equipment Installation Cost	<u>\$ 5,060,000</u>
Total Subscriber Equipment & Installation Cost	\$131,450,000

## Sheet 7 - King County Radio System Lease & FTE Cost NPV Calculations

Sheet 7 shows the calculations used to provide the Net Present Value ("NPV") of the cost site leases for new sites and for existing sites with an expanded footprint resulting from the addition of a new equipment shelter. This sheet also shows the NPV of cost of providing two FTEs for King County project managers over the duration of the new radio system project, which is assumed to be 7 years. Net Present Value represents the amount of "up front" dollars that would need to be invested at the beginning of the project to cover these costs over the assumed 7-year implementation period, assuming a certain rate of return on the initial dollars—assumed to be 3% in this case. The separate worksheets shown in Sheet 7 are described below:

- <u>New Shelter & Tower Lease</u> This worksheet shows the NPV calculations for the lease cost for a site with a new shelter and a new tower, based on an initial monthly lease of \$2100, an annual increase of 3%, and an interest rate of 3%. The NPV based on these assumptions is \$173,356.58.
- <u>New Tower Only Lease</u> This worksheet shows the NPV calculations for the lease cost for a site with a new shelter and a new tower, based on an initial monthly lease of \$1050, an annual increase of 3%, and an interest rate of 3%. The NPV based on these assumptions is \$86,678.29.
- King County FTEs This worksheet shows the NPV calculations for the cost of two FTEs ("Full Time Equivalent") for two King County Project Managers over the duration of the new radio system project, based on annual compensation of \$160,000, an annual cost-of-living escalator of 2.6%, and an interest rate of 3%. The NPV based on these assumptions is \$780,432.28 per FTE, or a total of \$1,560,864.56.

The monthly lease costs shown above are based on typical communications site lease costs in the Puget Sound region.

## Sheet 8 - King County P25 Radio System Cost Estimate – Assumptions

This sheet contains a list of the assumptions underlying the cost estimate, sorted by categories.

### Appendix A - King County P25 Radio System - Site Development & Land Use Cost Assumptions

This text document contains the specific assumptions underlying the site development and land use cost estimate shown in Sheet 2 above.

King County P25 Phase 2 Radio System Cost Estimate

Sheet 1 - King County P25 Radio System Cost Estimate Summary Sheet

King County P25 Phase 2 Radio System Cost Estimate Cost Estimate Summary 1/13/2012

SITE INFRASTRUCURE, SITE EQUIPMENT, SUBSCRIBER UNITS, AND INSTALLATION COSTS		
Repeater Sites - Equipment (56 Repeater Sites)	\$	70,180,000.00
Repeater Sites - Installation (56 Repeater Sites)	\$	1,900,000.000
Repeater Sites - Equipment and Installation Costs - Sub-Total	\$	72,080,000.00
Master Site Equipment (Dual Redundant Master Sites)	\$	2,500,000.00
Master Site Installation (Dual Redundant Master Sites)	\$	70,000.000
Master Site - Equipment and Installation Costs - Sub-Total	\$	2,570,000.00
Simulcast Prime Site Equipment (9 Prime Sites)	\$	5,680,000.00
Simulcast Prime Site Installation (9 Prime Sites)	\$	70,000.000
Simulcast Prme Sites - Equipment and Installation Costs - Sub-Total	\$	5,750,000.00
Dispatch Equipment	\$	11,610,000
Dispatch Equipment Installation	\$	350,000
Dispatch Equipment and Installation Costs - Sub-Total	\$	11,960,000
Interconnect System Equipment	\$	8,900,000
Interconnect System Installation	\$	250,000
Interconnect System Equipment and Installation - Sub-Total	\$	9,150,000
System Equipment Costs - Total	\$	98,870,000
System Installation Costs - Total	\$	2,640,000
System Equipment and Installation Costs - Total	\$	101,510,000
Subscriber Equipment	-	126,390,000
Subscriber Equipment Installation and Programing	-	5,060,000
Subscriber Equipment and Installation & Programming	\$	131,450,000
Site Infrastructure and Permitting Costs - Total	\$	55,180,000
System & Subscriber Equipment, Installation & Site Infrastructure Costs - Total	\$	288,140,000

SYSTEM SUPPORT & SOFT COSTS				
System Project Management	1	LS	6.2%	\$ 6,110,000
System Engineering	1	LS	3.4%	\$ 3,350,000
System Technologist	1	LS	3.5%	\$ 3,440,000
System Staging	1	LS	3.9%	\$ 3,880,000
System Documentation	1	LS	2.0%	\$ 1,980,000
Mobilization	1	LS	3.0%	\$ 2,970,000
Field Testing & Optimization	1	LS	3.5%	\$ 3,470,000
Coverage and System Acceptance Testing	1	LS	2.4%	\$ 2,400,000
Shipping	1	LS	2.0%	\$ 1,980,000
Spare Parts	1	LS	3.0%	\$ 2,970,000
Training	1	LS	2.0%	\$ 1,980,000
Sales Tax	1	LS	9.5%	\$ 21,400,000
Contingency	1	LS	10.0%	\$ 9,890,000
Warranty (per additional year)	3	Year	3.8%	\$ 11,280,000
System Update at Acceptance	1	LS	2.2%	\$ 2,160,000
Performance Bond	1	LS	1.3%	\$ 1,280,000
King County Project Management (NPV of 2 FTEs over project duration of 7 years)	2	LS	N/A	\$ 1,570,000
Engineering Consultant - Conceptual Design, Bid Specifications, Procurement Assistance,				
Installation and Testing Supervision, Project Management & Coordination	1	LS	6%	\$ 5,940,000
	SYSTEM SUPPORT	& SOFT COS	STS - TOTAL	\$88,050,000

SYSTEM TOTAL COST - SITE INFRASTRUCTRE, SITE EQUIPMENT, INSTALLATION, SUBSCRIBER UNITS, AND SYSTEM SUPPORT AND SOFT COSTS

\$ 376,190,000

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King County P25 Phase 2 Radio System Cost Estimate

## Sheet 2 - King County P25 Radio System Site Infrastructure Costs

## King County P25 Phase 2 Radio System Cost Estimate King County Mapping Project Sites

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team type         i         basy         Montr, or 53         COURT Provement in a set of the s	Education Hill	8	Existing	Watertank											3
team type         i         basy         Montr, or 53         COURT Provement in a set of the s															
team type         i         basy         Montr, or 53         COURT Provement in a set of the s						90mph (factort) 103%									
and in a second in	Horizon Heights	9	Existing	Maxed out, <b>60' SS</b>	101006.05		3	600	В	ш	27	28.9	20.7	23.3	6
and in a second in															
and in a second in															
and     and </td <td>Norway Hill</td> <td>10</td> <td>Existing</td> <td>Maxed out, <b>120' SS</b></td> <td>090630.07 100630.08</td> <td>90mph (fastest) 103% (after upgrades)</td> <td>3</td> <td>400</td> <td>В</td> <td>ш</td> <td>26.7</td> <td>29.9</td> <td>20.7</td> <td>29.2</td> <td>3</td>	Norway Hill	10	Existing	Maxed out, <b>120' SS</b>	090630.07 100630.08	90mph (fastest) 103% (after upgrades)	3	400	В	ш	26.7	29.9	20.7	29.2	3
Name     Image															
am     am    <	Verizon	11	Existing	MP by tank recent AN by others (not r	an as a Class III)										1
am     am    <															
number     number </td <td>West Tiger</td> <td>12</td> <td>Existing</td> <td>ATC AN CT</td> <td>110757.04</td> <td>Good by others</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td>	West Tiger	12	Existing	ATC AN CT	110757.04	Good by others									1
bank     and     and<	Crista														
org     org </td <td></td> <td></td> <td></td> <td></td> <td>101008.04 32-f</td> <td>t 85mph (3-sec) 52%</td> <td></td> <td></td> <td><u> </u></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>					101008.04 32-f	t 85mph (3-sec) 52%			<u> </u>						
And and and any organization of the state of the sta		10	Existing												-
And and and any organization of the state of the sta	King County Counthouse	10	Eviatian	reaftion no info											3
Cancel	Rattlesnake Mtn				101007.04	85mph (3-sec) 60%									
ng min	Rattlesnake Mtn							I	I					1	
Name         Name </td <td>Rattlesnake Mtn</td> <td>19</td> <td>Existing</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td>1</td> <td></td>	Rattlesnake Mtn	19	Existing									1		1	
Norm       2000 Mode	Ring Hill	20	Existing	recent NWTE AN	110749.07	85mph (3-sec) 83%									5
Note	Snoqualmie Pass (Dodge Ridge)				110815 04	05mph (2 app) 020/									
And the set of				recent rev G, new tower?	110815.04	605mpm (3-sec) 92 %				1				1	0
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Sobieski Mtn														
back for the probability of the p	Squak Mtn	25	Existing	160' SS	90655.06	90mph (fastest) 97%	3	1850	В	ш	27.4	39.6	20.7	32	3
np diam	Squak Mtn	26	Existing												
yp Math       ya       scamp       scamp       of it       gauze with the particular scatter with partin scatter with the partin scatter with the part	Squak Mtn			NIM/TE ANI <b>170' 88</b>	100614.06	100mph (factor) 01%	2	400	Р		26.7	20.1	25.6	40.0	5
And       Range				NWTE AN, 170 33	100814.00		3	400	В		20.7	30.1	23.0	40.9	<u> </u>
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$															
Contrained         Sole         Lend         Contraction         Sole         Lend         Contraction         Contraction <thcontraction< th=""> <thcontraction< th=""></thcontraction<></thcontraction<>	View Park	30	Existing	NG !!	90922.02	NWTE An NG									3
indication       indication <td>Cambridge</td> <td></td> <td>Existing</td> <td>NWTE AN, 140' SS</td> <td>90821.02</td> <td>100mph (fastest) 87%</td> <td>2</td> <td>400</td> <td>В</td> <td>ш</td> <td>23.9</td> <td>30.5</td> <td>25.6</td> <td>37.9</td> <td>3</td>	Cambridge		Existing	NWTE AN, 140' SS	90821.02	100mph (fastest) 87%	2	400	В	ш	23.9	30.5	25.6	37.9	3
CambridgeVC         93         Existing         NWTE AN, 180° SS         100660.06         90mph (tasket) 77%         3         2300         B         III         27.5         41.4         20.7         33.1         5           Skymy         96         Existing         NWTE AN, 180° SS         100660.06         90mph (tasket) 77%         3         2300         B         III         27.5         41.4         20.7         33         5           Skymy         96         Existing         NWTE AN, 90° MP         90732.04         90mph (tasket) 53%         3         130         B         III         28.1         24.3         20.7         26         270           36 brain [Doctions         1	Columbia Fort Lawton		1	No info											5
CambridgeVC         93         Existing         NWTE AN, 180° SS         100660.06         90mph (tasket) 77%         3         2300         B         III         27.5         41.4         20.7         33.1         5           Skymy         96         Existing         NWTE AN, 180° SS         100660.06         90mph (tasket) 77%         3         2300         B         III         27.5         41.4         20.7         33         5           Skymy         96         Existing         NWTE AN, 90° MP         90732.04         90mph (tasket) 53%         3         130         B         III         28.1         24.3         20.7         26         270           36 brain [Doctions         1															
CambridgeVC         93         Existing         NWTE AN, 180° SS         100660.06         90mph (tasket) 77%         3         2300         B         III         27.5         41.4         20.7         33.1         5           Skymy         96         Existing         NWTE AN, 180° SS         100660.06         90mph (tasket) 77%         3         2300         B         III         27.5         41.4         20.7         33         5           Skymy         96         Existing         NWTE AN, 90° MP         90732.04         90mph (tasket) 53%         3         130         B         III         28.1         24.3         20.7         26         270           36 brain [Doctions         1															
CambridgeVC         93         Existing         NWTE AN, 180° SS         100660.06         90mph (tasket) 77%         3         2300         B         III         27.5         41.4         20.7         33.1         5           Skymy         96         Existing         NWTE AN, 180° SS         100660.06         90mph (tasket) 77%         3         2300         B         III         27.5         41.4         20.7         33         5           Skymy         96         Existing         NWTE AN, 90° MP         90732.04         90mph (tasket) 53%         3         130         B         III         28.1         24.3         20.7         26         270           36 brain [Doctions         1															
AcDonald Mt.94ExistingNVTE AN, 180' SS100660.05 80mph (fastest) 7%3200BIII27.541.420.733.15Stywey95ExistingNVTE AN, 90' MP90732.04 90mph (fastest) 5%3100BIII28.128.120.727.633.177	Seatac Above Ground*	58	Existing	No info											1
AcDonald Mt.94ExistingNVTE AN, 180' SS100660.05 80mph (fastest) 7%3200BIII27.541.420.733.15Stywey95ExistingNVTE AN, 90' MP90732.04 90mph (fastest) 5%3100BIII28.128.120.727.633.177															
Skyway       95       Existing       NWTE AN. 90' MP       90732.04 Somph (fastest) 53%       3       30       B       III       28.1       24.3       20.7       27.6       3         18 Diving Loadions       1       1       1       1       1       1       1       1       1       28.1       24.3       20.7       27.6       3         18 Diving Loadions       1       1       1       1       1       1       1       1       28.1       24.3       20.7       27.6       3         18 Diving Loadions       1	CambridgeVC	93	Existing												
Skyway         95         Existing         NWTE AN, 90' MP         90732.0         90mph (tasket) 53%         3         30         B         III         28.1         24.3         20.7         27.6         3           28         58 min         -         -         -         -         -         -         -         -         28         -	McDonald Mt.	94	Existing	NWTE AN, <b>180' SS</b>	100650.05	90mph (fastest) 77%	3	2300	В	ш	27.5	41.4	20.7	33.1	5
28 Existing Laacinons	Skyway			NWTE AN, 90' MP	90732.04	90mph (fastest) 53%	3	130	В	ш	28.1	24.3	20.7	27.6	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	28 Existing Loactions														28
4       = New Hight Sites (Scenario 4)       inclusion of the stabilization measures not required       inclusion of the stabilization measures not requ		= New Low	Sites (Scenario	3)											
L. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower.       4       0       1	4	= New Hight	t Sites (Scenario	4) 					Total Existing	l otal New	Combined Lota				
Image: Section of Section Point Point Sectin Point Point Section Point Point Point Point Point Po		i ting shelter, b	i ackup power an	ر d tower/rooftop unmodified. Add equipm	ent racks and equipment to t	ower			4	0	4				
A construction of the stabilization measures not required in the stabilization measure in the stabilization measures not required in the stabilization measure in the stabilization measures not required in the stabilization measures not required in the stabilization measures not requ						lipment to tower.									
i       i															
Sexisting King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.       3       0       0															
Image: stabilization measures not required     Image: stabil															
ite topography such that retaining walls and other site stabilization measures not required	Additional Assumptions:		power, dt												
I     I <td></td> <td>lls and other s</td> <td>site stabilization</td> <td>measures not required</td> <td></td>		lls and other s	site stabilization	measures not required											
	Sites have power and telco avaliable.	l Dual prime ge	I nerator scenario	l o not included											

## King County P25 Phase 2 Radio System Cost Estimate

Tacoma Water Consultants Fee Proposal

**Construction Estimate** Quantity Construction Total Permit Fees (per site)

Quantity	(per site)	Construction Total	Permit Fees	Lease/Land Purchase	Consultants Fees	Antenna Equipment and RF design not imcluded	Totals
4	\$62,775.00	\$251,100.00	\$76,200.00	\$40,000.00	\$632,960.00	\$0.00	
0	\$130,275.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
37	\$596,700.00	\$22,077,900.00	\$3,045,100.00	\$6,784,193.36	\$9,589,937.50	\$0.00	
4	\$736,425.00	\$2,945,700.00	\$329,200.00	\$743,426.31	\$1,118,700.00	\$0.00	
8	\$209,250.00	\$1,674,000.00	\$450,400.00	\$1,486,852.62	\$1,693,680.00	\$0.00	
3	\$464,400.00	\$1,393,200.00	\$171,600.00	\$297,534.87	\$372,495.00	\$0.00	
56	Totals	\$28,341,900.00	\$4,072,500.00	\$9,352,007.16	\$13,407,772.50	\$0.00	\$55,174,179.66
	Quantity 4 0 37 4 8 8 3 3 56	Quantity         (per site)           4         \$62,775.00           0         \$130,275.00           37         \$596,700.00           4         \$736,425.00           8         \$209,250.00           3         \$464,400.00	Quantity         (per site)         Construction Total           4         \$62,775.00         \$251,100.00           0         \$130,275.00         \$0.00           37         \$596,700.00         \$22,077,900.00           4         \$736,425.00         \$2,945,700.00           8         \$209,250.00         \$1,074,000.00           3         \$464,400.00         \$1,393,200.00	Quantity         (per site)         Construction Total         Permit Fees           4         \$62,775.00         \$251,100.00         \$76,200.00           0         \$130,275.00         \$0.00         \$0.00           37         \$596,700.00         \$22,077,900.00         \$3,045,100.00           4         \$736,425.00         \$2,945,700.00         \$329,200.00           8         \$209,250.00         \$1,674,000.00         \$450,400.00           3         \$464,400.00         \$1,393,200.00         \$171,600.00	Quantity         (per site)         Construction Total         Permit Fees         Lease/Land Purchase           4         \$62,775.00         \$251,100.00         \$76,200.00         \$40,000.00           0         \$130,275.00         \$0.00         \$0.00         \$0.00           37         \$556,700.00         \$22,077,900.00         \$3,045,100.00         \$6,784,193.36           4         \$736,425.00         \$2,945,700.00         \$329,200.00         \$743,426.31           8         \$209,250.00         \$1,674,000.00         \$\$450,400.00         \$1,486,852.62           3         \$464,400.00         \$1,393,200.00         \$171,600.00         \$297,534.87	Quantity         (per site)         Construction Total         Permit Fees         Lease/Land Purchase         Consultants Fees           4         \$62,775.00         \$251,100.00         \$76,200.00         \$40,000.00         \$632,960.00           0         \$130,275.00         \$0.00         \$0.00         \$0.00         \$0.00           37         \$566,700.00         \$22,077,900.00         \$3,045,100.00         \$6,784,193.36         \$9,589,937.50           4         \$736,425.00         \$2,945,700.00         \$329,200.00         \$743,426.31         \$1,118,700.00           8         \$209,250.00         \$1,674,000.00         \$450,400.00         \$1,486,852.62         \$1,693,680.00           3         \$464,400.00         \$1,393,200.00         \$171,600.00         \$297,534.87         \$372,495.00	Quantity         (per site)         Construction Total         Permit Fees         Lease/Land Purchase         Consultants Fees         Antenna Equipment and RF design not imcluded           4         \$62,775.00         \$251,100.00         \$76,200.00         \$40,000.00         \$632,960.00         \$0.00           0         \$130,275.00         \$0.00         \$0.00         \$0.00         \$0.00         \$0.00           37         \$556,700.00         \$22,077,900.00         \$3,045,100.00         \$678,4193.36         \$9,589,937.50         \$0.00           4         \$736,425.00         \$2,245,700.00         \$329,200.00         \$743,426.31         \$1,118,700.00         \$0.00           8         \$209,250.00         \$1,674,000.00         \$450,400.00         \$1,486,852.62         \$1,693,680.00         \$0.00           3         \$464,400.00         \$1,393,200.00         \$171,600.00         \$297,534.87         \$372,495.00         \$0.00

Scenarios
1. Existing King County site - reuse existing shelter, backup power and tower unmodified. Added equipment racks and equipment to tower

2. Existing King County - site reuse existing shelter, backup power and tower structural modification required. Added equipment racks and equipment to tower.

3. (Low land site) All new King County site new shelter (50x 50), backup power and tower 180ft SS  $\,$ 

4. (High site) All new King County site compound (50x50) new shelter (10x 25), backup power and tower 180ft SS, road work required

5. Existing King County site - new shelter due to lack of space, backup power and tower unmodified. Added equipment racks and equipment to tower

6. Existing King County site - reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Added equipment racks and equipment to tower.

Hatfield & Dawson Consulting Engineers



### Scenario #1

1. Existing King County site - reuse existing shelter, backup power and tower unmodified. Added equipment racks and equipment to tower

	Item	Qty	Sub-Total	MU	TOTAL	ACTUAL	ТАХ	SHIP/SPCI
Sitework								
Site Setup/ Mobilizations	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Site Layout Staking	\$0.00		\$0.00	35%	\$0.00			
Clearing	\$0.00		\$0.00	35%	\$0.00			
Earthwork	\$0.00		\$0.00	35%	\$0.00			
Drainage scheme	\$0.00		\$0.00	35%	\$0.00			
Special Inspections	\$5,000.00		\$5,000.00		\$6,750.00			
Road upgrade (Driveway - minor)	\$0.00		\$0.00		\$0.00			
Road Upgrade (5-miles)	\$0.00		\$0.00		\$0.00			
Noise Mitigation	\$2,000.00		\$2,000.00		\$2,700.00			
Site Paving/Gravel	\$0.00		\$0.00		\$0.00			
Landscaping/Grass	\$0.00		\$0.00		\$0.00			
Standard Site Grounding	\$5,000.00		\$5,000.00		\$6,750.00			
Mountain Top Grounding (XIT Rods)	\$0.00		\$0.00		\$0.00			
Fencing	\$0.00		\$0.00		\$0.00			
Site Cleanup - Demobilization	\$3,000.00		\$3,000.00		\$4,050.00			
Tower	<i><b>Q</b></i> <b>QQQQQQQQQQQQQ</b>		<i><i><i>ϕ</i>0,000100</i></i>	0070	<i><i><i>ϕ</i></i> 1,000100</i>			
Tower (Stamped Dwg's & Tower Steel)	\$0.00		\$0.00	35%	\$0.00			
Tower Delivery (Anchor Bolts Separate)	\$0.00		\$0.00		\$0.00			
Existing tower demolition	\$0.00		\$0.00		\$0.00			
Tower Upgrades/modifications	\$0.00		\$0.00		\$0.00			
Foundation (Matt Type)	\$0.00		\$0.00		\$0.00			
Foundation (Drilled Pier Caisson)	\$0.00		\$0.00		\$0.00			
Erection	\$0.00		\$0.00		\$0.00		-	
70 Ton Crane (Mob, Rental, Operation)	\$5,000.00		\$5,000.00		\$6,750.00			
Ice Bridge (20-ft)	\$5,000.00		<u>\$3,000.00</u> \$0.00		\$0,750.00			
Grounding (Tower, Antenna & Lines)	\$0.00		\$0.00	35%	\$0.00			
Antenne and line work install (Included								
Antenna and line work install (Included	¢0.00		<b>¢</b> 0.00	050/	<b>¢</b> 0.00			
in Radio System Installation Cost)	\$0.00		\$0.00		\$0.00			
Migration	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Building	<u> </u>		<u> </u>	050(	<b>#</b> 0.00			· ·
Structure	\$0.00		\$0.00		\$0.00			inc
Foundation	\$0.00		\$0.00		\$0.00			
Installation of radio equipment	\$0.00		\$0.00		\$0.00			
Installation of shelter	\$0.00		\$0.00		\$0.00			
Crane	\$0.00		\$0.00		\$0.00			
Fire Protection	\$0.00		\$0.00		\$0.00			
Com Trench	\$0.00		\$0.00		\$0.00			
Transformer Upgrade	\$3,500.00		\$3,500.00		\$4,725.00			
Power to Building (from on site meter)	\$0.00		\$0.00		\$0.00			
Mics Electrical Power Work	\$7,500.00		\$7,500.00	35%	\$10,125.00			
Permits								
Use Permit	\$0.00		\$0.00	35%	\$0.00			
Electrical Permit	\$500.00		\$500.00	35%	\$675.00			
Generator								
Generator/ Switch gear	\$0.00	1	\$0.00	35%	\$0.00			
Generator Pad	\$0.00		\$0.00		\$0.00			
Fuel Tank (Standby in City)	\$0.00		\$0.00		\$0.00			
Fuel Tank (Standby Mountain Top)	\$0.00		\$0.00		\$0.00		1	
Fill Fuel Tank and Final Testing	\$0.00		\$0.00		\$0.00		1	1
Installation	\$0.00		\$0.00		\$0.00		1	-
Not Included (separte spreadsheet)	20.00		20.00					1
Land use and Building Permits		[						
Radio equipment and coax							1	1
Consultants fees								-
				1		1	1	1

TOTAL: \$46,500.00



Assumptions for Scenario #1 Tower meets rev G (2) 6ft HP dishes (2) 800 MHz mast on new mounts Existing power supply Existing backup power

Scenarios

1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required



### Scenario #2

2. Existing King County - site reuse existing shelter, backup power and tower structural modification required. Added equipment racks and equipment to tower.

	Item	Qty	Sub-Total	MU	TOTAL	ACTUAL	ТАХ	SHIP/SPCI
Sitework				-	-			
Site Setup/ Mobilizations	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Site Layout Staking	\$0.00		\$0.00	35%	\$0.00			
Clearing	\$0.00		\$0.00		\$0.00			
Earthwork	\$0.00		\$0.00	35%	\$0.00			
Drainage scheme	\$0.00		\$0.00	35%	\$0.00			
Special Inspections	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Road upgrade (Driveway - minor)	\$0.00		\$0.00	35%	\$0.00			
Road Upgrade (5-miles)	\$0.00		\$0.00	35%	\$0.00			
Noise Mitigation	\$2,000.00		\$2,000.00		\$2,700.00			
Site Paving/Gravel	\$0.00		\$0.00	35%	\$0.00			
Landscaping/Grass	\$0.00		\$0.00	35%	\$0.00			
Standard Site Grounding	\$5,000.00		\$5,000.00		\$6,750.00			
Mountain Top Grounding (XIT Rods)	\$0.00		\$0.00		\$0.00			
Fencing	\$0.00		\$0.00		\$0.00			
Site Cleanup - Demobilization	\$3,000.00		\$3,000.00		\$4,050.00			
Tower	<i><b>Q</b></i> <b>QQQQQQQQQQQQQ</b>		<i><i><i>ϕ</i>0,000100</i></i>	0070	<i><i><i>ϕ</i> 1,000100</i></i>			
Tower (Stamped Dwg's & Tower Steel)	\$0.00		\$0.00	35%	\$0.00			
Tower Delivery (Anchor Bolts Separate)	\$0.00		\$0.00		\$0.00			
Existing tower demolition	\$0.00		\$0.00		\$0.00			
Tower Upgrades/modifications	\$50,000.00		\$50,000.00	35%	\$67,500.00			_
Foundation (Matt Type)	\$0.00		\$30,000.00	35%	\$0.00			_
Foundation (Drilled Pier Caisson)	\$0.00		\$0.00		\$0.00			
Erection	\$0.00		\$0.00		\$0.00			
	\$0.00		\$0.00	35%	\$0.00			
70 Ton Crane (Mob, Rental, Operation)			\$5,000.00 \$0.00					
Ice Bridge (20-ft)	\$0.00		- · · ·	35%	\$0.00			
Grounding (Tower, Antenna & Lines)	\$0.00		\$0.00	35%	\$0.00		-	
Antenna and line work install (Included			<b>*</b> • • •		<b>*</b>			
in Radio System Installation Cost)	\$0.00		\$0.00		\$0.00			
Migration	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Building					·			
Structure	\$0.00		\$0.00		\$0.00			inc
Foundation	\$0.00		\$0.00		\$0.00			
Installation of radio equipment	\$0.00		\$0.00	35%	\$0.00			
Installation of shelter	\$0.00		\$0.00	35%	\$0.00			
Crane	\$0.00		\$0.00	35%	\$0.00			
Fire Protection	\$0.00		\$0.00	35%	\$0.00			
Com Trench	\$0.00		\$0.00	35%	\$0.00			
Transformer Upgrade	\$3,500.00		\$3,500.00	35%	\$4,725.00			
Power to Building (from on site meter)	\$0.00		\$0.00	35%	\$0.00			
Mics Electrical Power Work	\$7,500.00		\$7,500.00	35%	\$10,125.00			
Permits	, ,				, ,			
Use Permit	\$0.00		\$0.00	35%	\$0.00			
Electrical Permit	\$500.00		\$500.00		\$675.00		1	
Generator	,	·	,		,			
Generator/ Switch gear	\$0.00	1	\$0.00	35%	\$0.00			
Generator Pad	\$0.00		\$0.00		\$0.00			
Fuel Tank (Standby in City)	\$0.00		\$0.00		\$0.00			1
Fuel Tank (Standby Mountain Top)	\$0.00		\$0.00		\$0.00			
Fill Fuel Tank and Final Testing	\$0.00		\$0.00		\$0.00		1	
Installation	\$0.00		\$0.00		\$0.00			-
Not Included (separte spreadsheet)	ψ0.00		ψ0.00	0070	φ0.00		L	
Land use and Building Permits								
Radio equipment and coax								
Consultants fees							<u> </u>	+
CONSULATION TEES							1	1

TOTAL: \$96,500.00

<u>\$130,275.00</u>

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Assumptions for Scenario #1 Tower meets rev G after tower modifications (2) 6ft HP dishes (2) 800 MHz mast on new mounts Existing power supply Existing backup power

Scenarios

1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required



### Scenario #3

3. (Low land site) All new King County site compound (50x50) new shelter (10x 25), backup power and tower 180ft SS

	Item	Qty	Sub-Total	MU	TOTAL	ACTUAL	ТАХ	SHIP/SPC
Sitework								
Site Setup/ Mobilizations	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Site Layout Staking	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Clearing	\$3,000.00		\$3,000.00		\$4,050.00			
Earthwork	\$2,000.00		\$2,000.00	35%	\$2,700.00			
Drainage scheme	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Special Inspections	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Road upgrade (Driveway - minor)	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Road Upgrade (5-miles)	\$0.00		\$0.00	35%	\$0.00			
Noise Mitigation	\$2,000.00		\$2,000.00	35%	\$2,700.00			
Site Paving/Gravel	\$6,000.00		\$6,000.00	35%	\$8,100.00			
Landscaping/Grass	\$6,000.00		\$6,000.00	35%	\$8,100.00			
Standard Site Grounding	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Mountain Top Grounding (XIT Rods)	\$0.00		\$0.00		\$0.00			
Fencing	\$5,000.00		\$5,000.00		\$6,750.00			
Site Cleanup - Demobilization	\$3,000.00		\$3,000.00		\$4,050.00			
Tower	\$0,000.00	I	\$0,000.00	0070	φ1,000.00			
Tower (Stamped Dwg's & Tower Steel)	\$95,000.00		\$95,000.00	35%	\$128,250.00			
Tower Delivery (Anchor Bolts Separate)	\$16,000.00		\$16,000.00		\$21,600.00			
Existing tower demolition	\$0.00		\$10,000.00	35%	\$21,000.00			_
Tower Upgrades/modifications	\$0.00		\$0.00	35%	\$0.00			_
Foundation (Matt Type)	\$0.00		\$0.00	35%	\$0.00			
Foundation (Drilled Peer Caisson)	\$55,000.00		\$55,000.00	35%	\$0.00 \$74,250.00			
Erection				35%				
	\$30,000.00		\$30,000.00		\$40,500.00			
70 Ton Crane (Mob, Rental, Opperat)	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Ice Bridge (20-ft)	\$2,500.00		\$2,500.00	35%	\$3,375.00		-	
Grounding (Tower, Antenna & Lines)	\$5,000.00		\$5,000.00	35%	\$6,750.00			-
Antenna and line work install (Included								
in Radio System Installation Cost)	\$0.00		\$0.00					_
Migration	\$10,000.00		\$10,000.00	35%	\$13,500.00			_
Building								
Structure	\$56,000.00		\$56,000.00	35%	\$75,600.00			inc
Foundation	\$15,000.00		\$15,000.00	35%	\$20,250.00			
Installation of radio equipment	\$0.00		\$0.00	35%	\$0.00			
Installation of shelter	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Crane	\$9,000.00		\$9,000.00	35%	\$12,150.00			
Fire Protection	\$0.00		\$0.00	35%	\$0.00			
Com Trench	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Transformer Upgrade	\$3,500.00		\$3,500.00	35%	\$4,725.00			
Power to Building (from on site meter)	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Mics Electrical Power Work	\$7,500.00		\$7,500.00	35%	\$10,125.00			
Permits	+ ,		<b>*</b> · <b>, ·</b> · · · · · · · · · · · · · · · · ·		••••			
Use Permit	\$0.00		\$0.00	35%	\$0.00			
Electrical Permit	\$500.00		\$500.00					
Generator	ψυυυ.υυ		ψ000.00	5578	ψ075.00			
	\$40,000.00	1	\$40,000.00	35%	\$54,000.00			
Generator/ Switch gear Generator Pad	\$40,000.00	1			\$1,350.00			+
			\$1,000.00					
Fuel Tank (Standby in City)	\$1,500.00		\$1,500.00		\$2,025.00			
Fuel Tank (Standby Mountain Top)	\$0.00		\$0.00		\$0.00		ļ	+
Fill Fuel Tank and Final Testing	\$4,500.00		\$4,500.00		\$6,075.00			
Installation	\$2,000.00		\$2,000.00	35%	\$2,700.00			
Not Included (separte spreadsheet)						I		T
Land use and Building Permits								
Radio equipment and coax								
Consultants fees								

<u>TOTAL: \$442,000.00</u>



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Assumptions for Scenario #1 Tower meets rev G (2) 6ft HP dishes (2) 800 MHz mast on new mounts Existing power supply Existing backup power Proposed 180ft SS tower 50x50 compound

Scenarios

1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required



Scenario #4

4. (High site) All new King County site (50x 50), backup power and tower 180ft SS, road work required

	Item	Qty	Sub-Total	MU	TOTAL	ACTUAL	ТАХ	SHIP/SPCL
Sitework								
Site Setup/ Mobilizations	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Site Layout Staking	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Clearing	\$3,000.00		\$3,000.00		\$4,050.00			
Earthwork	\$2,000.00		\$2,000.00		\$2,700.00			
Drainage scheme	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Special Inspections	\$5,000.00		\$5,000.00		\$6,750.00			
Road upgrade (Driveway - minor)	\$0.00		\$0.00		\$0.00			
Road Upgrade (5-miles)	\$100,000.00		\$100,000.00		\$135,000.00			
Noise Mitigation	\$2,000.00		\$2,000.00		\$2,700.00			
Site Paving/Gravel	\$6,000.00		\$6.000.00		\$8,100.00			
Landscaping/Grass	\$0.00		\$0.00		\$0.00			
Standard Site Grounding	\$0.00		\$0.00		\$0.00			
Mountain Top Grounding (XIT Rods)	\$15,000.00		\$15,000.00		\$20,250.00			
Fencing	\$5,000.00		\$5,000.00		\$6,750.00			
Site Cleanup - Demobilization	\$3,000.00		\$3,000.00		\$4,050.00			_
Tower	\$3,000.00		\$3,000.00	5570	\$4,030.00			
	¢05,000,00	- I	¢05 000 00	250/	¢100.050.00			
Tower (Stamped Dwg's & Tower Steel)	\$95,000.00		\$95,000.00		\$128,250.00		1	
Tower Delivery (Anchor Bolts Separate)	\$16,000.00		\$16,000.00		\$21,600.00			
Existing tower demolition	\$0.00		\$0.00		\$0.00			
Tower Upgrades/modifications	\$0.00		\$0.00		\$0.00			
Foundation (Matt Type)	\$30,000.00		\$30,000.00		\$40,500.00			
Foundation (Drilled Peer Caisson)	\$0.00		\$0.00		\$0.00			
Erection	\$30,000.00		\$30,000.00		\$40,500.00			
70 Ton Crane (Mob, Rental, Opperat)	\$10,000.00		\$10,000.00		\$13,500.00			
Ice Bridge (20-ft)	\$2,500.00		\$2,500.00		\$3,375.00			
Grounding (Tower, Antenna & Lines)	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Antenna and line work install (Included								
in Radio System Installation Cost)	\$0.00		\$0.00		\$0.00			
Migration	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Building								
Structure	\$80,000.00		\$80,000.00		\$108,000.00			inc
Foundation	\$15,000.00		\$15,000.00		\$20,250.00			
Installation of radio equipment	\$0.00		\$0.00		\$0.00			
Installation of shelter	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Crane	\$15,000.00		\$15,000.00	35%	\$20,250.00			
Fire Protection	\$0.00		\$0.00	35%	\$0.00			
Com Trench	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Transformer Upgrade	\$3,500.00		\$3,500.00	35%	\$4,725.00			
Power to Building (from on site meter)	\$4,000.00		\$4,000.00		\$5,400.00			
Mics Electrical Power Work	\$7,500.00		\$7,500.00		\$10,125.00			
Permits								
Use Permit	\$0.00		\$0.00	35%	\$0.00			
Electrical Permit	\$500.00		\$500.00		\$675.00			
Generator	<i><i><i>qccccccccccccc</i></i></i>		<i><i><i>qooooooooooooo</i></i></i>	0070	<i><b>Q</b>(1)</i>			
Generator/ Switch gear	\$40,000.00	1	\$40,000.00	35%	\$54,000.00			
Generator Pad	\$1,000.00		\$1,000.00		\$1,350.00		1	
Fuel Tank (Standby in City)	\$1,500.00		\$1,500.00		\$2,025.00			
Fuel Tank (Standby Mountain Top)	\$4,500.00		\$1,500.00		\$6,075.00			
Fill Fuel Tank and Final Testing	\$4,500.00		\$4,500.00		\$6,075.00			
Installation	\$4,500.00		\$4,500.00		\$6,075.00 \$2,700.00			
	\$∠,000.00		ֆ∠,000.00	JJ%	⇒∠,700.00	I	I	-
Not Included (separte spreadsheet)							T T	
Land use and Building Permits								
Radio equipment and coax								
Consultants fees								

<u>TOTAL: \$545,500.00</u>

<u>\$736,425.00</u>

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Assumptions for Scenario #4

(2) 6ft HP dishes(2) 800 MHz mast on new mountsExisting power supply

Proposed 180ft SS tower 50x50 compound

Scenarios

1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required



### Scenario #5

5. Existing King County site - new shelter due to lack of space, backup power and tower unmodified. Added equipment racks and equipment to tower

	Item	Qty	Sub-Total	MU	TOTAL	ACTUAL	ТАХ	SHIP/SPCI
Sitework								
Site Setup/ Mobilizations	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Site Layout Staking	\$0.00		\$0.00		\$0.00			
Clearing	\$0.00		\$0.00	35%	\$0.00			
Earthwork	\$2,000.00		\$2,000.00	35%	\$2,700.00			
Drainage scheme	\$0.00		\$0.00	35%	\$0.00			
Special Inspections	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Road upgrade (Driveway - minor)	\$0.00		\$0.00		\$0.00			
Road Upgrade (5-miles)	\$0.00		\$0.00		\$0.00			
Noise Mitigation	\$2,000.00		\$2,000.00		\$2,700.00			
Site Paving/Gravel	\$0.00		\$0.00		\$0.00			
Landscaping/Grass	\$6,000.00		\$6,000.00		\$8,100.00			
Standard Site Grounding	\$5,000.00		\$5,000.00		\$6,750.00			
Mountain Top Grounding (XIT Rods)	\$0.00		\$0.00		\$0.00		1	
Fencing	\$5,000.00		\$5,000.00		\$6,750.00		1	
Site Cleanup - Demobilization	\$3,000.00		\$3,000.00		\$4,050.00			
Tower	φ0,000.00		φ0,000.00	0070	φ-1,000.00			
Tower (Stamped Dwg's & Tower Steel)	\$0.00		\$0.00	35%	\$0.00			
Tower Delivery (Anchor Bolts Separate)	\$0.00		\$0.00		\$0.00			
Existing tower demolition	\$0.00		\$0.00		\$0.00		-	-
Tower Upgrades/modifications	\$0.00		\$0.00		\$0.00			-
Foundation (Matt Type)	\$0.00		\$0.00 \$0.00		\$0.00			
			<b>+</b>					
Foundation (Drilled Peer Caisson)	\$0.00		\$0.00		\$0.00			_
	\$0.00		\$0.00		\$0.00			-
70 Ton Crane (Mob, Rental, Opperat)	\$0.00		\$0.00		\$0.00			_
Ice Bridge (20-ft)	\$2,500.00		\$2,500.00		\$3,375.00			
Grounding (Tower, Antenna & Lines)	\$0.00		\$0.00	35%	\$0.00			
Antenna and line work install (Included	• • • • •		• • • • •		•			
in Radio System Installation Cost)	\$0.00			35%	\$0.00			
Migration	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Building				1				
Structure	\$56,000.00		\$56,000.00		\$75,600.00			inc
Foundation	\$15,000.00		\$15,000.00		\$20,250.00			
Installation of radio equipment	\$0.00		\$0.00		\$0.00			
Installation of shelter	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Crane	\$9,000.00		\$9,000.00	35%	\$12,150.00			
Fire Protection	\$0.00		\$0.00	35%	\$0.00			
Com Trench	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Transformer Upgrade	\$3,500.00		\$3,500.00	35%	\$4,725.00			
Power to Building (from on site meter)	\$4,000.00		\$4,000.00		\$5,400.00			
Mics Electrical Power Work	\$7,500.00		\$7,500.00		\$10,125.00			
Permits	+ ,		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		+ - ,			
Use Permit	\$0.00		\$0.00	35%	\$0.00			
Electrical Permit	\$500.00		\$500.00		\$675.00			
Generator	φ000.00		φ000.00	0070	<b>Q010.00</b>			
Generator/ Switch gear	\$0.00	1	\$0.00	35%	\$0.00			
Generator Pad	\$0.00	-		35%	\$0.00		1	
Fuel Tank (Standby in City)	\$0.00			35%	\$0.00		-	
Fuel Tank (Standby Mountain Top)	\$0.00			35%	\$0.00			-
Fill Fuel Tank and Final Testing	\$0.00		\$0.00		\$0.00			-
Installation			\$0.00 \$0.00					
	\$0.00		φ <b>0.0</b> 0	35%	\$0.00		L	
Not Included (separte spreadsheet)							T	
Land use and Building Permits								
Radio equipment and coax								
Consultants fees								

TOTAL: \$155,000.00



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Assumptions for Scenario #5 Tower meets rev G (2) 6ft HP dishes (2) 800 MHz mast on new mounts Existing power supply Existing backup power new shelter

Scenarios

1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required



### Scenario #6

6. Existing King County site - reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Added equipment racks and equipment to tower.

	Item	Qty	Sub-Total	MU	TOTAL	ACTUAL	ТАХ	SHIP/SPCI
Sitework								
Site Setup/ Mobilizations	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Site Layout Staking	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Clearing	\$3,000.00		\$3,000.00		\$4,050.00			
Earthwork	\$2,000.00		\$2,000.00	35%	\$2,700.00			
Drainage scheme	\$4,000.00		\$4,000.00	35%	\$5,400.00			
Special Inspections	\$5,000.00		\$5,000.00	35%	\$6,750.00			
Road upgrade (Driveway - minor)	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Road Upgrade (5-miles)	\$0.00		\$0.00		\$0.00			
Noise Mitigation	\$2,000.00		\$2,000.00		\$2,700.00			
Site Paving/Gravel	\$6,000.00		\$6,000.00	35%	\$8,100.00			
Landscaping/Grass	\$6,000.00		\$6,000.00		\$8,100.00			
Standard Site Grounding	\$5,000.00		\$5,000.00		\$6,750.00			
Mountain Top Grounding (XIT Rods)	\$0.00		\$0.00		\$0.00			
Fencing	\$5,000.00		\$5,000.00		\$6,750.00			
Site Cleanup - Demobilization	\$3,000.00		\$3,000.00		\$4,050.00			
Tower	+-,		<i><b>+</b>•,••••••••••••••</i>		+ .,			
Tower (Stamped Dwg's & Tower Steel)	\$95,000.00		\$95,000.00	35%	\$128,250.00			
Tower Delivery (Anchor Bolts Separate)	\$16,000.00		\$16,000.00		\$21,600.00			
Existing tower demolition	\$40,000.00		\$40,000.00		\$54,000.00			
Tower Upgrades/modifications	\$0.00		\$0.00		\$0.00			
Foundation (Matt Type)	\$0.00		\$0.00		\$0.00			
Foundation (Drilled Peer Caisson)	\$55,000.00		\$55,000.00		\$74,250.00			
Erection	\$30,000.00		\$30,000.00		\$40,500.00			_
70 Ton Crane (Mob, Rental, Opperat)	\$5,000.00		\$5,000.00		\$6,750.00			_
Ice Bridge (20-ft)	\$2,500.00		\$2,500.00		\$3,375.00	-	-	
Grounding (Tower, Antenna & Lines)	\$2,500.00				\$6,750.00			_
Grounding (Tower, Antenna & Lines)	\$5,000.00		\$5,000.00	33%	<del>ф</del> 0,750.00			
Antonno and line work install (Included								
Antenna and line work install (Included	¢0.00		¢0.00	250/	¢0.00			
in Radio System Installation Cost)	\$0.00		\$0.00		\$0.00			
Migration	\$10,000.00		\$10,000.00	35%	\$13,500.00			
Building	<b>\$0.00</b>		<u> </u>	050/	<u> </u>			· · · ·
Structure	\$0.00		\$0.00		\$0.00		-	inc
Foundation	\$0.00		\$0.00		\$0.00			_
Installation of radio equipment	\$0.00		\$0.00		\$0.00			
Installation of shelter	\$0.00		\$0.00		\$0.00			
Crane	\$0.00		\$0.00		\$0.00			
Fire Protection	\$0.00		\$0.00		\$0.00			
Com Trench	\$10,000.00		\$10,000.00		\$13,500.00			_
Transformer Upgrade	\$3,500.00		\$3,500.00		\$4,725.00			
Power to Building (from on site meter)	\$4,000.00		\$4,000.00		\$5,400.00			
Mics Electrical Power Work	\$7,500.00		\$7,500.00	35%	\$10,125.00			
Permits								
Use Permit	\$0.00		\$0.00	35%	\$0.00			
Electrical Permit	\$500.00		\$500.00	35%	\$675.00			
Generator								
Generator/ Switch gear	\$0.00	1	\$0.00	35%	\$0.00			
Generator Pad	\$0.00		\$0.00		\$0.00			
Fuel Tank (Standby in City)	\$0.00		\$0.00		\$0.00			
Fuel Tank (Standby Mountain Top)	\$0.00		\$0.00		\$0.00			
Fill Fuel Tank and Final Testing	\$0.00		\$0.00		\$0.00			
Installation	\$0.00		\$0.00		\$0.00		1	-
Not Included (separte spreadsheet)	<i></i>		<i>\</i>					
Land use and Building Permits								
Radio equipment and coax							1	
Consultants fees								
				1 1		I	1	1

<u>TOTAL:</u> \$344,000.00



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Assumptions for Scenario #6 Tower meets rev G (2) 6ft HP dishes (2) 800 MHz mast on new mounts Existing power supply Existing backup power Proposed 180ft SS tower 50x50 compound

Scenarios

1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required

Scenario #1 1. Existing King County site reuse existing shelter, backup power and tower unmodified. Added equipment racks and equipment to tower. Buildimg Permit Only; no land use required

Engineering Consultant project management Site Visits Site Feasibility Study Site Visits (Sub Contractors) Lease Exhibt Drawings Title Report Property Survey (Site w/ 250ft of Road)	Towers etc           sub total         rate         hrs         s           \$0         \$150         0           \$1,000         \$100         10           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0 \$100 0 \$0 \$100 0 \$1,600 \$100 16	Survey           sub total         rate         hrs         s           \$0         \$100         0         0           \$0         \$100         0         0	\$0 \$100 0	Legal/Site Acquisition       sub total     rate     hrs       \$	Enviromental/Permitting sub total rate hrs 0 \$0 \$100 0	Electrical/RF design Management sub total rate hrs	sub total rate hrs	MU	TOTAL
Site Visits         Site Feasibility Study         Site Visits (Sub Contractors)         Lease Exhibt Drawings         Title Report         Property Survey (Site w/ 250ft of Road)	\$1,000 \$100 10 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0	\$0 \$100 0 \$1,600 \$100 16			\$0 \$100	0 \$0 \$100 0	<b>#10.000</b>	00 00 0100	0 45%	
Site Visits         Site Feasibility Study         Site Visits (Sub Contractors)         Lease Exhibt Drawings         Title Report         Property Survey (Site w/ 250ft of Road)	\$1,000 \$100 10 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0	\$0 \$100 0 \$1,600 \$100 16			\$0 \$100	0 \$0 \$100 0	<b>#10,000</b>	00 00 0100	0 4 5 0/	
Site Feasibility Study Site Visits (Sub Contractors) Lease Exhibt Drawings Title Report Property Survey (Site w/ 250ft of Road)	\$0 \$100 0 \$0 \$100 0 \$0 \$100 0	\$1,600 \$100 16	\$0 \$100 0			φο φισο σ	\$16,000 \$200	80 \$0 \$100	0 15%	\$18,400
Site Visits (Sub Contractors) Lease Exhibt Drawings Title Report Property Survey (Site w/ 250ft of Road)	\$0 \$100 0 \$0 \$100 0	. , .		\$0 \$100 C	\$0 \$100	0 \$600 \$100 6	\$100	0 \$0 \$100	0 15%	\$1,840
Lease Exhibt Drawings Title Report Property Survey (Site w/ 250ft of Road)	\$0 \$100 0		\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$1,840
Title Report Property Survey (Site w/ 250ft of Road)		\$800 \$100 8	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$920
Property Survey (Site w/ 250ft of Road)		\$800 \$100 8	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$920
	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$C
Additional Daad Ourses (050ft to 00000ft)	\$0 \$100 0	\$0 \$100 0	\$3,500 \$100 35	\$0 \$100 0	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$4,025
Additional Road Survey (250ft to 2000ft)	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$C
Survey Coordination	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 10	\$0 \$100	0 \$0 \$100	0 15%	\$C
NIER Report	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	<i><i><i></i></i></i>	25 \$0 \$100	0 15%	\$5,750
Intermod Report	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$16,000 \$200	80 \$0 \$100	0 15%	\$18,400
Noise Report	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$C
										\$0
Civil (Target Drainage)	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
Structural Tower Analysis	\$2,000 \$100 20	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$2,300
Structural Existing Tower Inspection	\$2,000 \$100 20	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$2,300
Structural Tower Upgrade design	\$3,000 \$100 30	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100 O	\$0 \$100	0 \$0 \$100	0 15%	\$3,450
Geotechnical	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$5,500 \$100 55		0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$6,325
Project Design	\$500 \$100 5	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$575
Land Use Drawings	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
Building Permit Drawings	\$0 \$100 0	\$6,000 \$100 60	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$6,900
Bid Drawings	\$0 \$100 0	\$1,800 \$100 18	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$1,000 \$100 10	\$0 \$100	0 \$0 \$100	0 15%	\$3,220
Construction Drawings	\$0 \$100 0 \$0 \$100 0	\$1,500 \$100 15 \$1,500 \$100 15	\$0 \$100 0 \$0 \$100 0	\$0 \$100 C \$0 \$100 C	) \$0 \$100 \$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	\$0 \$100 \$0 \$100	0 \$0 \$100 0 \$0 \$100	0 15%	\$1,725 \$1,725
As built Drawings		. , .							0 15%	\$1,725
Landscape Drawings	\$0 \$100 0	\$2,500 \$100 25	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	
Grounding drawings	\$0 \$100 0	\$1,500 \$100 15	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0 \$1,725
Electrical drawings (one line)	\$0 \$100 0	\$1,500 \$100 15 \$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100 \$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	· · · · ·	55 \$0 \$100	0 15%	\$6,325
Bid Spec Coordination	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100 \$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	\$5,500 \$100	0 \$0 \$100	0 15%	
Elect designs and spec	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0 \$0
Mech designs & specs	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0 \$0
Building Specs	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0 \$0
Tower Specs	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0 \$0
FAA/FCC Filings (Tower, Microwave & Land Mobile)	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0		2.5 \$0 \$100	0 15%	\$12,075
Owner supplied equipment bids (racks gens etc)	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
Enviromental Site Assessment (phase I)	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0 \$0
Road Design	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	) \$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
Contruction Staking	\$0 \$100 0	\$100 0	\$0 \$100 0	\$0 \$100 0	) \$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$100	0 15%	\$0
Construction Coordination	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	) \$0 \$100	0 \$2,500 \$100 25		0 \$0 \$100	0 15%	\$2,875
Permit Applications	\$0 \$100 C	φ0 φ100 0	<b>40 4100</b> 0		, <del>, , , , , , , , , , , , , , , , , , </del>	ψ2,000 φ100 20	\$0 \$100	φο φτου	0 10 /0	\$0
LU - General meetings paperwork etc	\$1,000 \$100 10	\$1,200 \$100 12	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$2,530
Pre-application Meetings	\$0 \$100 0	\$1,000 \$100 10	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$1,150
Public Notice Board	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	) \$0 \$100	0 \$0 \$100 5	\$0 \$100	0 \$0 \$100	0 15%	\$0
BP - General meetings paperwork etc	\$1,000 \$100 10	\$1,200 \$100 12	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$6,300 \$100 63	\$0 \$100	0 \$0 \$100	0 15%	\$9,775
SEPA	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
SHPO (FCC 620/622)	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$7,100 \$100 71	\$0 \$100	0 \$0 \$100	0 15%	\$8,165
NEPA	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$2,700 \$100 27		0 \$0 \$100	0 15%	\$3,105
Public Hearings	\$0 \$100 0	\$0 \$100 0		\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
Balloon Test	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
Photos Sims	\$0 \$100 0	\$1,000 \$100 10	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$1,150
Building Permit Management	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$500 \$100 5	\$0 \$100	0 \$0 \$100	0 15%	\$575
Project Management	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$1,000 \$100 10	\$0 \$100	0 \$0 \$100	0 15%	\$1,150
Bids and Constuction										\$0
Construction Admin	\$1,000 \$100 10	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$2,000 \$100 20		0 \$0 \$100	0 15%	\$3,450
Bid Management	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$10,000 \$100 100		0 \$0 \$100	0 15%	\$11,500
Construction Site visits	\$1,000 \$100 10	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$1,000 \$100 10	\$0 \$100	0 \$0 \$100	0 15%	\$2,300
As built Drawings	\$1,500 \$100 15	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$300 \$100 3	\$0 \$100	0 \$0 \$100	0 15%	\$2,070
OM Manual	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$200 \$100 2	\$0 \$100	0 \$0 \$100	0 15%	\$230
Full tower climb inspection and report (new towers)	\$2,000 \$100 20	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$2,300
Legal/										\$0
Legal Consultant	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$200	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
Site Acquisition Admin	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$2,000 \$100 20	¥- ¥	0 \$0 \$100	0 15%	\$2,300
Site Acquisition Consultant	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$100	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
Print Fees	\$0 \$100 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100 C	\$0 \$0	0 \$0 \$100 0	\$0 \$100	0 \$0 \$100	0 15%	\$0
Design Total	\$16,000 160	\$22,400 224	\$3,500 35	\$5,500 55	5 \$0 \$0	0 \$37,200 387	\$53,000 292	2.5 \$0	0	\$158,240

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Lease/ Lease Support																			
Purchase Land	\$0 \$100	0 \$0 \$100	0 \$0 \$100 (	\$0 \$100	0	\$0	\$0	0	\$0	\$100	0	\$0	\$100	0	\$0	\$100	0	0%	\$0
Lease 50x 50 plot	\$0 \$100	0 \$0 \$100	0 \$0 \$100 (	\$0 \$100	0	\$0	\$0	0	\$0	\$100	0	\$0	\$100	0	\$0	\$100	0	0%	\$0
New Lease/Lease Revision/Admin	\$0 \$100	0 \$0 \$100	0 \$0 \$100 (	\$0 \$100	0	\$0	\$0	0	\$10,000	\$100	100	\$0	\$100	0	\$0	\$100	0	0%	\$10,000
																			\$10,000
Permit Fees																			
Permit Fees - Pre-Application	\$0 \$100	0 \$0 \$100	0 \$0 \$100 (	\$0 \$100	0	\$1,500	\$0	0	\$1,500	\$100	15	\$0	\$100	0	\$0	\$100	0	0%	\$3,000
Permit Fees LU	\$0 \$100	0 \$0 \$100	0 \$0 \$100 (	\$0 \$100	0	\$0	\$0	0	\$0	\$100	0	\$0	\$100	0	\$0	\$100	0	0%	\$0
Permit Fees BP	\$0 \$100	0 \$0 \$100	0 \$0 \$100 (	\$0 \$100	0	\$15,000	\$0	0	\$800	\$100	8	\$0	\$100	0	\$0	\$100	0	0%	\$15,800
Permit Fees - Demo	\$0 \$100	0 \$0 \$100	0 \$0 \$100 (	\$0 \$100	0	\$250	\$0	0	\$0	\$100	0	\$0	\$100	0	\$0	\$100	0	0%	\$250
				•		-				-									\$19,050
Not Included																			
Wild Life Study																			
RF designs etc (H&D) separate estimate																			
Critical Slopes																			

Scenarios 1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required

Scenario #2 2. Existing King County site reuse existing shelter, backup power and tower structural**modification** required. Added equipment racks and equipment to tower. Builing permit only

Consultant	Towe	ers etc		ES A&E	Survey		Ci	vil		Legal/Site Acquisition	Enviromental/Pern	nittina	Electrical/RF of	lesian M	anagement		Geotec	h MU	TOTAL
Design	sub total		hrs	sub total rate hrs										J. J					
Engineering Consultant project management	\$0	+		\$0 \$100 0	<b>\$0</b> \$1			\$100	0	\$0 \$100 0	\$0		0 \$16,000	\$200	80		\$100	0 0%	
Site Visits	\$1,000			\$0 \$100 0		00		\$100	0	\$0 \$100 0	\$500	\$100	5	\$100	0		\$100	0 0%	\$1,500
Site Feasibility Study	\$0	<b></b>	0	\$0 \$100 0		00		\$100	0	\$0 \$100 0	\$0	\$100	0\$0	\$100	0	¥ -	\$100	0 15%	\$0
Site Visits (Sub Contractors - bid walk)	\$0	<b></b>	0	\$800 \$100 8	\$0 \$1			\$100	0	\$0 \$100 0	\$500	\$100	5 \$0	\$100	0		\$100	0 15%	\$1,495
Lease Exhibt Drawings	\$0	+	0	\$800 \$100 8	\$0 \$1			\$100	0	\$0 \$100 0	\$0	\$100	D \$0	\$100	0		\$100	0 15%	\$920
Title Report	\$0	<b></b>	0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$0	\$100	D \$0	\$100	0		\$100	0 15%	
Property Survey (Site w/ 250ft of Road)	\$0	+	0	\$3,500 \$100 35	\$0 \$1			\$100	0	\$0 \$100 0	\$0	\$100	0 \$0	\$100	0		\$100	0 15%	\$4,025
Additional Road Survey (250ft to 2000ft)	\$0		0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$0	\$100	D \$0	\$100	0		\$100	0 15%	\$0
Survey Coordination	\$0	<b></b>		\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$1,000	\$100 1	0 \$0	\$100	0		\$100	0 15%	\$1,150
NIER Report	\$0	<b></b>		\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$0	\$100	0 \$5,000	\$200	25		\$100	0 15%	\$5,750
Intermod Report	\$0	+	_	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$0	\$100	0 \$16,000	\$200	80		\$100	0 15%	\$18,400
Noise Report	\$0	\$100	0	\$0 \$100 0	\$0 \$1	00	0 \$2,000	\$100	20	\$0 \$100 0	\$0	\$100	0 \$0	\$100	0	\$0	\$100	0 15%	
Oixil (Terret Draine an)	<b>^</b>	¢400		<u> </u>	<u> </u>	00	0 <b>(</b> 0	¢400	0	<b>*</b> 2 <b>*</b> 100	<u> </u>	¢100	n (* 1	¢400		¢o	¢400	0 459/	\$0
Civil (Target Drainage)	\$0	<b></b>		\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$0	\$100	0 \$0	\$100	0		\$100	0 15%	
Structural Tower Analysis	\$2,000	\$100		\$0 \$100 0 \$0 \$100 0		00		\$100 \$100	0	\$0 \$100 0 \$0 \$100 0	\$0 \$0	\$100 ( \$100 (	0 \$0 0 \$0	\$100 \$100	0		\$100 \$100	0 15%	\$2,300 \$2,300
Structural Existing Tower Inspection	\$2,000	\$100							0	** * · · ·		1		<b>T</b>	0	¥ -	+ · ·	0 15%	\$2,300
Structural Tower Upgrade design Geotechnical	\$2,000 \$0	\$100 \$100		\$0 \$100 0 \$0 \$100 0	\$0 \$1 \$0 \$1		0 \$0 0 \$5,500	\$100 \$100	0 55	\$0 \$100 0 \$0 \$100 0	\$0 \$1.000	\$100 0 \$100 10	0 \$0 0 \$0	\$100 \$100	0	¥ -	\$100 \$100	0 15% 0 15%	
Project Design	\$0	\$100			\$0 \$1 \$0 \$1			\$100	22	\$0 \$100 0 \$0 \$100 0	\$1,000 \$0	\$100 10	50 50 50	\$100	0		\$100	0 15%	
Land Use Drawings	\$3,000 \$0		30	\$0 \$100 0	\$0 \$ \$0 \$1			\$100	0	\$0 \$100 0 \$0 \$100 0	\$0 \$7,050	\$100 70.	5 \$0	\$100	0		\$100	0 15%	\$3,450 \$8,108
Building Permit Drawings	\$0			\$6,000 \$100 60	\$0 \$ \$0 \$1			\$100	0	\$0 \$100 0 \$0 \$100 0	\$7,050 \$0	\$100 70.3	5 \$0 0 \$0	\$100	0		\$100	0 15%	
Bid Drawings	\$0			\$1,800 \$100 80 \$1,800 \$100 18	\$0 \$ \$0 \$1			\$100	0	\$0 \$100 0	\$0 \$6,350	\$100 63.	5 \$0	\$100	0		\$100	0 15%	\$9,373
Construction Drawings	\$0			\$1,500 \$100 18 \$1,500 \$100 15	\$0 \$ \$0 \$			\$100	0	\$0 \$100 0	\$0,330 \$0	\$100 03.	5 \$0 0 \$0	\$100	0		\$100	0 15%	\$1,725
As built Drawings	\$0		0	\$1,500 \$100 15 \$1,500 \$100 15	\$0 \$1 \$0 \$1			\$100	0	\$0 \$100 0	\$300	\$100 3	3 \$0	\$100	0		\$100	0 15%	
Landscape Drawings	\$0		0	\$2,500 \$100 25	\$0 \$1			\$100	0	\$0 \$100 0	\$300		3 \$0	\$100	0		\$100	0 15%	
	φ0	φ100		φ2,000 φ100 20	φυφ	00	φ0	φ100	Ŭ	φ0 φ100 0	\$000	\$100 x	φ0	φ100	0	ψU	φ100	0 10/0	\$0
Grounding drawings	\$0	\$100	0	\$1,500 \$100 15	\$0 \$1	00	0 \$0	\$100	0	\$0 \$100 0	\$0	\$100	0 \$0	\$100	0	\$0	\$100	0 15%	\$1,725
Electrical drawings (one line)	\$0		0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$1,000	\$100 10	0 \$5,500	\$100	55		\$100	0 15%	\$7,475
Bid Spec Coordination	\$0	<b></b>	0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$1,000	\$100 10	0 \$0	\$100	0		\$100	0 15%	\$1,150
Elec designs and spec	\$0		0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$500	\$100	5 \$0	\$100	0	¥ -	\$100	0 15%	\$575
Mech designs and spec	\$0		0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$500	\$100	5 \$0	\$100	0		\$100	0 15%	
Building Specs	\$0		0	\$0 \$100 0	\$0 \$1	00		\$100	0	\$0 \$100 0	\$1,000	\$100 10	0 \$0	\$100	0		\$100	0 15%	
Tower Specs	\$0	\$100	0	\$0 \$100 0	\$0 \$1	00	0 \$0	\$100	0	\$0 \$100 0	\$0	\$100	0 \$0	\$100	0	\$0	\$100	0 15%	\$0
FAA/FCC Filings (Tower, Microwave & Land Mobile)	\$0	\$100	0	\$0 \$100 0	\$0 \$1	00	0 \$0	\$100	0	\$0 \$100 0	\$0	\$100	0 \$10,500	\$200	52.5	\$0	\$100	0 15%	\$12,075
Owner supplied equipment bids (racks gens etc)	\$0	\$100	0	\$0 \$100 0	\$0 \$1	00	0 \$0	\$100	0	\$0 \$100 0	\$0	\$100	0 \$0	\$100	0	\$0	\$100	0 15%	\$0
Enviromental Site Assessment (phase I)	\$0	\$100	0	\$0 \$100 0	\$0 \$1	00	0 \$0	\$100	0	\$0 \$100 0	\$0	\$100	0 \$0	\$100	0	\$0	\$100	0 15%	\$0
Road Design	\$0	\$100	0	\$0 \$100 0	\$0 \$1	00	0 \$0	\$100	0	\$0 \$100 0	\$0	\$100	0\$0	\$100	0	\$0	\$100	0 15%	\$0
Contruction Staking	\$0	\$100	0	\$100 0	<b>\$0 \$</b> 1	00	0 \$0	\$100	0	\$0 \$100 0	\$0	\$100	D \$0	\$100	0		\$100	0 15%	\$0
Construction Coordination	\$0	\$100	0	\$0 \$100 0	\$0 \$1	00	0 \$0	\$100	0	\$0 \$100 0	\$2,500	\$100 2	5 \$0	\$100	0	\$0	\$100	0 15%	\$2,875
Permit Applications																			\$0
LU -General meetings paperwork etc	\$0	<b></b>	0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$0	\$100	0 \$0	\$100	0		\$100	0 15%	\$0
Pre-application Meetings paperwork etc	\$0	<b></b>	0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$2,200	\$100 23	÷.	\$100	0	¥ -	\$100	0 15%	\$2,530
Public Notice Board	\$0	<b></b>	0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$350	\$100 3.5		\$100	0		\$100	0 15%	
BP -General meetings paperwork etc	\$500		5	\$500 \$100 5	\$0 \$1			\$100	0	\$0 \$100 0	\$6,300	\$100 63		\$100	0		\$100	0 15%	
SEPA	\$0	<b></b>	0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$0	\$100	D \$0	\$100	0		\$100	0 15%	
SHPO (FCC 612)	\$0		0	\$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0	\$7,100	\$100 7	1 \$0	\$100	0		\$100	0 15%	\$8,165
NEPA	\$0		0	\$0 \$100 0		00	-	\$100	0	\$0 \$100 0	\$2,700	\$100 2	7 \$0	\$100	0		\$100	0 15%	\$3,105
Public Hearings		\$100		0 \$0 \$100 0	\$0 \$1			\$100	0	\$0 \$100 0		\$100		\$100			\$100	0 15%	
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Lease/ Lease Support																										
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Lease 50x 50 plot	\$0	\$100	0	\$C	\$100	0	\$0	\$100	0	\$0 \$10	0	0	\$0	\$0	0	\$0	\$10	0	\$0	\$100	0	\$0	\$100	0	0%	\$0
New Lease/Lease Revision/Admin	\$0	\$100	0	\$C	\$100	0	\$0	\$100	0	\$0 \$10	0	0	\$0	\$0	0	\$0	\$100	C	\$0	\$100	0	\$0	\$100	0	0%	\$0
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						-			-			-			-				-	•						\$6,300
Not Included																										
Wild Life Study																										
RF designs etc (H&D) separate estimate																										
Critical Slopes																										

Scenarios
1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required

Scenario #3 3. (Low land site) All new King County site new shelter (50x 50), backup power and tower 180ft SS. Landuse and builing permit. Site zoning allows tower construction

Designsub totalrateEngineering Consultant project management\$0Site Visits\$1,000Site Visits\$1,000Site Visits\$1000Site Visits\$1000Site Visits\$1000Lease Exhibt Drawings\$20Property Survey (Site w/ 250ft of Road)\$0Additional Road Survey (250ft to 2000ft)\$00Survey Coordination\$00NiER Report\$00NiER Report\$00Noise Report\$00Noise Report\$00Structural Tower Analysis\$00Structural Tower Analysis\$00Structural Tower Upgrade design\$00Structural Tower Structural Struc	50 50 00 1 00 00 00 00 00 00 00 00	0         \$0         \$100           0         \$0         \$100           0         \$1,600         \$100           0         \$800         \$100           0         \$800         \$100           0         \$800         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$1,500         \$100           0         \$1,500         \$100           0         \$1,500         \$100           0         \$2,500         \$100           0         \$1,500         \$100	0         0           16         8           8         0           0         15	\$0         \$100         0           \$0         \$100         0      \$0         \$100	\$0         \$100         0           \$0         \$100         0      \$0         \$100	\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100	0         \$0           0         \$100           0         \$500           0         \$500           0         \$0           0         \$0           0         \$0           0         \$0           0         \$100	0 5 0 0 0 0 0 0 0 0 5 5 0 0 0 0 0 0 0 0	\$32,000 \$200 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$100 \$0 \$100 \$10,000 \$200 \$10,000 \$200 \$0 \$100 \$0		\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$100           \$100	0 0% 0 15% 0 15%	\$32,000 \$1,500 \$920 \$920 \$805 \$5,750 \$1,150 \$5,750 \$18,400 \$2,875 \$0 \$4,600 \$4,600 \$0 \$13,225 \$4,600
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Survey Coordination       \$0       \$1         NIER Report       \$0       \$1         Noise Report       \$0       \$1         Noise Report       \$0       \$1         Civil (Target Drainage)       \$0       \$1         Structural Tower Analysis       \$0       \$1         Structural Tower Inspection       \$0       \$1         Geotechnical       \$0       \$1         Iand Use Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Construction Drawings       \$0       \$1         Landscape Drawings       \$0       \$1         Grounding drawings       \$0       \$1         Landscape Drawings       \$0       \$1         Grounding drawings       \$0       \$1         Electrical drawings (one line)       \$0       \$1         Bid Spec Coordination       \$2,000       \$1         Elect designs and spec       \$0       \$1         Mech designs and spec       \$1,000       \$1         Mech designs and spec       \$1,000       \$1         Enviromental Site Assessment (phase I)       \$0       \$1	00           00	0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$4,500         \$100           0         \$1,800         \$100           0         \$1,500         \$100           0         \$2,500         \$100           0         \$1,500         \$100	0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         15           0         15	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$2,000         \$100         20           \$4,000         \$100         40           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0 \$100 \$0 \$100	0         \$1,000         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$500         \$100           0         \$500         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100	0 10 0 5 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$100 \$5,000 \$200 \$16,000 \$200 \$0 \$100 \$0 \$100		\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100           \$100	0 15% 0 15% 0 15% 0 15% 0 15% 0 15% 0 15% 0 15% 0 15% 50 15%	\$1,150 \$5,750 \$18,400 \$2,875 \$0 \$4,600 \$4,600 \$0 \$0 \$0 \$0 \$0 \$13,225
NIER Report       \$0       \$1         Intermod Report       \$0       \$1         Noise Report       \$0       \$1         Civil (Target Drainage)       \$0       \$1         Structural Tower Analysis       \$0       \$1         Structural Tower Analysis       \$0       \$1         Structural Tower Upgrade design       \$0       \$1         Geotechnical       \$0       \$1         Project Design       \$4,000       \$1         Land Use Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Bid Drawings       \$0       \$1         Construction Drawings       \$0       \$1         Landscape Drawings       \$0       \$1         Electrical drawings       \$0       \$1         Electrical drawings (one line)       \$0       \$1         Bid Spec Coordination       \$2,000       \$1         Building Specs       \$1,000       \$1         Mech designs and spec       \$0       \$1         Mech designs and spec       \$1,000       \$1         Building Specs       \$1,000       \$1         Contruction Coordination       \$0       \$1         Road Desi	00           00	0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$4,500         \$100           0         \$1,800         \$100           0         \$1,500         \$100           0         \$2,500         \$100           0         \$1,500         \$100	0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         15           0         15	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0         \$100         0           \$0         \$100         0           \$2,000         \$100         20           \$4,000         \$100         40           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100           \$0         \$100	0         \$0         \$100           0         \$0         \$100           0         \$500         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100	0 0 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$5,000 \$200 \$16,000 \$200 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100		\$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00	\$100 \$100 \$100 \$100 \$100 \$100 \$100 \$100	0 15% 0 15% 0 15% 0 15% 0 15% 0 15% 0 15% 50 15%	\$5,750 \$18,400 \$2,875 \$0 \$4,600 \$0 \$0 \$0 \$0 \$0 \$13,225
Intermod Report       \$0       \$1         Noise Report       \$0       \$1         Civil (Target Drainage)       \$0       \$1         Structural Tower Analysis       \$0       \$1         Structural Existing Tower Inspection       \$0       \$1         Structural Existing Tower Inspection       \$0       \$1         Structural Existing Tower Upgrade design       \$0       \$1         Geotechnical       \$0       \$1         Land Use Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Construction Drawings       \$0       \$1         As built Drawings       \$0       \$1         Grounding drawings       \$0       \$1         Electrical drawings (one line)       \$0       \$1         Bid Spec Coordination       \$2,000       \$1         Building Specs       \$0       \$1         Building Specs       \$1,000       \$1         FAA/FCC Filings (Tower, Microwave & Land Mobile)       \$0       \$1         Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Road Design       \$0       \$1         Construc	00           00	0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$6,000         \$100           0         \$1,800         \$100           0         \$1,500         \$100           0         \$2,500         \$100           0         \$1,500         \$100           0         \$1,500         \$100	0         0           0         0           0         0           0         0           0         0           0         0           0         45           0         60           18         15           0         15	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0         \$100         0           \$2,000         \$100         20           \$4,000         \$100         40           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0 \$100 \$0 \$100	0         \$0         \$100           0         \$500         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$100         \$100           0         \$1,000         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100	0 0 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$16,000 \$200 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100		\$0 \$0 \$0 \$0 \$0 \$5,000 \$5,000	\$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100	0 15% 0 15% 0 15% 0 15% 0 15% 0 15% 50 15%	\$18,400 \$2,875 \$0 \$4,600 \$0 \$0 \$0 \$13,225
Noise Report       \$0       \$1         Civil (Target Drainage)       \$0       \$1         Structural Tower Analysis       \$0       \$1         Structural Tower Inspection       \$0       \$1         Structural Tower Upgrade design       \$0       \$1         Structural Tower Upgrade design       \$0       \$1         Geotechnical       \$0       \$1         Land Use Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Bid Drawings       \$0       \$1         Construction Drawings       \$0       \$1         As built Drawings       \$0       \$1         Grounding drawings       \$0       \$1         Electrical drawings (one line)       \$0       \$1         Bid Spec Coordination       \$2,000       \$1         Building Specs       \$1,000       \$1         Tower Specs       \$1,000       \$1         FAA/FCC Filings (Tower, Microwave & Land Mobile)       \$0       \$1         Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Enviromental Site Assessment (phase I)       \$0       \$1         Construction Coordination       \$0       \$1         Envir	00           00	0 \$0 \$100 0 \$4,500 \$100 0 \$1,800 \$100 0 \$1,500 \$100 0 \$1,500 \$100 0 \$2,500 \$100 0 \$1,500 \$100	0         0           0         0           0         0           0         0           0         0           0         0           0         45           0         60           18         15           0         15	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$2,000 \$100 20 \$4,000 \$100 40 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$5,500 \$100 55 \$0 \$100 0 \$5,500 \$100 0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0	\$0 \$100 \$0 \$100	0         \$500         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$100         \$100           0         \$1,000         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100	0 0 0 0 10 70.5	\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100		\$0 \$0 \$0 \$0 \$5,000 \$5,000	\$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100       \$100	0 15% 0 15% 0 15% 0 15% 0 15% 50 15%	\$2,875 \$0 \$4,600 \$0 \$0 \$0 \$13,225
Civil (Target Drainage)       \$0       \$1         Structural Tower Analysis       \$0       \$1         Structural Tower Analysis       \$0       \$1         Structural Tower Upgrade design       \$0       \$1         Geotechnical       \$0       \$1         Geotechnical       \$0       \$1         Land Use Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Construction Drawings       \$0       \$1         As built Drawings       \$0       \$1         Construction Drawings       \$0       \$1         Grounding drawings       \$0       \$1         Grounding drawings       \$0       \$1         Bid Spec Coordination       \$2,000       \$1         Electrical drawings (one line)       \$0       \$1         Bid Spec Coordination       \$2,000       \$1         Elect designs and spec       \$0       \$1         Mech designs and spec       \$0       \$1         Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Tower Specs       \$1,000       \$1         Enviromental Site Assessment (phase I)	00 00 00 00 00 00 00 00 00 00 00 00 00	0 \$0 \$100 0 \$4,500 \$100 0 \$1,500 \$100 0 \$1,500 \$100 0 \$2,500 \$100 0 \$2,500 \$100 0 \$1,500 \$100	0         0           0         0           0         0           0         0           0         0           0         0           0         45           0         60           18         15           0         15	\$0 \$100 0 \$0 \$100 0	\$4,000 \$100 40 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$5,500 \$100 55 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0	\$0 \$100 \$0 \$100	0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$1,000         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100	0 0 0 0 10 70.5	\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100		\$0 \$0 \$0 \$5,000 \$5,000	\$100 \$100 \$100 \$100 \$100 \$100 \$100	0 15% 0 15% 0 15% 0 15% 50 15%	\$0 \$4,600 \$0 \$0 \$0 \$13,225
Structural Tower Analysis       \$0       \$1         Structural Existing Tower Inspection       \$0       \$1         Structural Tower Upgrade design       \$0       \$1         Geotechnical       \$0       \$1         Project Design       \$4,000       \$1         Land Use Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Construction Drawings       \$0       \$1         As built Drawings       \$0       \$1         Grounding drawings       \$0       \$1         Electrical drawings (one line)       \$0       \$1         Electrical drawings (one line)       \$0       \$1         Building Specs       \$1,000       \$1         Tower Specs       \$1,000       \$1         Prover Specs       \$1,000       \$1         Construction Coordination       \$0       \$1         Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Power Specs       \$1,000       \$1         Road Design       \$0       \$1         Construction Coordination       \$0       \$1         Road Design       \$0       \$	00           00	0 \$0 \$100 0 \$4,500 \$100 0 \$4,500 \$100 0 \$1,800 \$100 0 \$1,500 \$100 0 \$2,500 \$100 0 \$1,500 \$100	0         0           0         0           0         0           0         0           0         0           0         0           0         45           0         60           18         15           0         15	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$5,500         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100	0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$1,000         \$100           0         \$1,000         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100	0 0 0 10 70.5	\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100		\$0 \$0 \$5,000 \$5,000	) \$100 ) \$100 ) \$100 ) \$100	0 15% 0 15% 0 15% 50 15%	\$4,600 \$0 \$0 \$0 \$13,225
Structural Tower Analysis       \$0       \$1         Structural Existing Tower Inspection       \$0       \$1         Structural Tower Upgrade design       \$0       \$1         Geotechnical       \$0       \$1         Project Design       \$4,000       \$1         Land Use Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Construction Drawings       \$0       \$1         As built Drawings       \$0       \$1         Grounding drawings       \$0       \$1         Electrical drawings (one line)       \$0       \$1         Electrical drawings (one line)       \$0       \$1         Building Specs       \$1,000       \$1         Tower Specs       \$1,000       \$1         Prover Specs       \$1,000       \$1         Construction Coordination       \$0       \$1         Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Power Specs       \$1,000       \$1         Road Design       \$0       \$1         Construction Coordination       \$0       \$1         Road Design       \$0       \$	00           00	0 \$0 \$100 0 \$4,500 \$100 0 \$4,500 \$100 0 \$1,800 \$100 0 \$1,500 \$100 0 \$2,500 \$100 0 \$1,500 \$100	0         0           0         0           0         0           0         0           0         0           0         0           0         45           0         60           18         15           0         15	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$5,500         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100	0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$1,000         \$100           0         \$1,000         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100           0         \$100         \$100	0 0 0 10 70.5	\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100		\$0 \$0 \$5,000 \$5,000	) \$100 ) \$100 ) \$100 ) \$100	0 15% 0 15% 0 15% 50 15%	\$0 \$0 \$0 \$13,225
Structural Existing Tower Inspection       \$0       \$1         Structural Tower Upgrade design       \$0       \$1         Geotechnical       \$0       \$1         Project Design       \$4,000       \$1         Land Use Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         Building Permit Drawings       \$0       \$1         As built Drawings       \$0       \$1         Landscape Drawings       \$0       \$1         As built Drawings       \$0       \$1         Landscape Drawings       \$0       \$1         Grounding drawings       \$0       \$1         Electrical drawings (one line)       \$0       \$1         Bid Spec Coordination       \$2,000       \$1         Mech designs and spec       \$0       \$1         Building Specs       \$1,000       \$1         Tower Specs       \$1,000       \$1         Enviromental Site Assessment (phase I)       \$0       \$1         Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Construction Coordination       \$0       \$1         Construction Coordination <td>00 00 00 00 00 00 00 00 00 00 00 00 00</td> <td>0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$4,500 \$100 0 \$4,500 \$100 0 \$1,800 \$100 0 \$1,500 \$100 0 \$2,500 \$100 0 \$1,500 \$100</td> <td>0 0 0 0 0 45 0 60 0 18 0 15 0 15</td> <td>\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0</td> <td>\$0         \$100         0           \$0         \$100         0           \$5,500         \$100         55           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0</td> <td>\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100</td> <td>0         \$0         \$100           0         \$0         \$100           0         \$1,000         \$100           0         \$100         \$100           0         \$100         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$7,050         \$100           0         \$0         \$100</td> <td>0 0 10 0 70.5</td> <td>\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100</td> <td></td> <td>) \$( ) \$( ) \$5,000 ) \$(</td> <td>) \$100 ) \$100 ) \$100</td> <td>0 15% 0 15% 50 15%</td> <td>\$0 \$0 \$13,225</td>	00 00 00 00 00 00 00 00 00 00 00 00 00	0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$0 \$100 0 \$4,500 \$100 0 \$4,500 \$100 0 \$1,800 \$100 0 \$1,500 \$100 0 \$2,500 \$100 0 \$1,500 \$100	0 0 0 0 0 45 0 60 0 18 0 15 0 15	\$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0         \$100         0           \$0         \$100         0           \$5,500         \$100         55           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0           \$0         \$100         0	\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100	0         \$0         \$100           0         \$0         \$100           0         \$1,000         \$100           0         \$100         \$100           0         \$100         \$100           0         \$0         \$100           0         \$0         \$100           0         \$0         \$100           0         \$7,050         \$100           0         \$0         \$100	0 0 10 0 70.5	\$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100 \$0 \$100		) \$( ) \$( ) \$5,000 ) \$(	) \$100 ) \$100 ) \$100	0 15% 0 15% 50 15%	\$0 \$0 \$13,225
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Mech designs and spec       \$0       \$1         Building Specs       \$1,000       \$1         Tower Specs       \$1,000       \$1         FAA/FCC Filings (Tower, Microwave & Land Mobile)       \$0       \$1         Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Enviromental Site Assessment (phase I)       \$0       \$1         Road Design       \$0       \$1         Contruction Staking       \$0       \$1         Construction Coordination       \$0       \$1         Permit Applications       BP - General meetings paperwork etc       \$2,000       \$1         Pre-application Meetings       \$750       \$1         Public Notice Board       \$0       \$1         LU - General meetings paperwork etc       \$0       \$1         SEPA       \$0       \$1		\$0 \$100	0 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0	\$0 \$100	0	\$(	\$100	0 15%	\$2,300
Building Specs       \$1,000       \$1         Tower Specs       \$1,000       \$1         FAA/FCC Filings (Tower, Microwave & Land Mobile)       \$0       \$1         Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Enviromental Site Assessment (phase I)       \$0       \$1         Road Design       \$0       \$1         Contruction Staking       \$0       \$1         Construction Coordination       \$0       \$1         Permit Applications       BP - General meetings paperwork etc       \$2,000       \$1         Pre-application Meetings       \$750       \$1         Public Notice Board       \$0       \$1         LU - General meetings paperwork etc       \$0       \$1         SEPA       \$0       \$1	00	0 \$0 \$100	0 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$1,000 \$100	10	\$0 \$100	0 0		\$100	0 15%	\$1,150
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FAA/FCC Filings (Tower, Microwave & Land Mobile)       \$0       \$1         Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Enviromental Site Assessment (phase I)       \$0       \$1         Road Design       \$0       \$1         Contruction Staking       \$0       \$1         Construction Coordination       \$0       \$1         Permit Applications       90       \$1         BP - General meetings paperwork etc       \$2,000       \$1         Pre-application Meetings       \$750       \$1         LU -General meetings paperwork etc       \$0       \$1         SEPA       \$0       \$1		0 \$0 \$100		\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$1,000 \$100	10	\$0 \$100			\$100	0 15%	\$2,300
Owner supplied equipment bids (racks gens etc)       \$1,000       \$1         Enviromental Site Assessment (phase I)       \$0       \$1         Road Design       \$0       \$1         Contruction Staking       \$0       \$1         Construction Coordination       \$0       \$1         Permit Applications       90       \$1         BP - General meetings paperwork etc       \$2,000       \$1         Pre-application Meetings       \$750       \$1         LU -General meetings paperwork etc       \$0       \$1         SEPA       \$0       \$1		0 \$0 \$100	0 0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0	\$0 \$100			\$100	0 15%	\$1,150
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Design Total \$25,250	00 2 00 00 00 00	0 \$0 \$100	257	\$5,000 50	\$11,500 115		110 \$72,300	723			\$5,000		50	\$259,188

## King County P25 Phase 2 Radio System Cost Estimate

Lease/ Lease Support																						
Purchase Land	\$0	\$100 (	0 \$0 \$100	0 C	\$0 \$100	0	\$0	\$100	0	\$0	\$0	0	\$0	\$100	0	\$0 \$1	00	0	\$0\$	5100	0 0%	\$0
Lease 50x 50 plot	\$0	\$100	0 \$0 \$100	0 C	\$0 \$100	0	\$0	\$100	0	\$173,357	\$0	0	\$0	\$100	0	\$0 \$1	00	0	\$0 \$	5100	0 0%	\$173,357
New Lease/Lease Revision/Admin	\$0	\$100 (	0 \$0 \$100	0 0	\$0 \$100	0	\$0	\$100	0	\$0	\$0	0	\$10,000	\$100	100	\$0 \$1	00	0	\$0 \$	5100	0 0%	\$10,000
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Permit Fees																						
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Permit Fees LU	\$0	\$100	0 \$0 \$100	0 C	\$0 \$100	0	\$0	\$100	0	\$25,000	\$0	0	\$4,000	\$100	40	\$0 \$1	00	0	\$0 \$	5100	0 0%	\$29,000
Permit Fees BP	\$0	\$100	0 \$0 \$100	0 C	\$0 \$100	0	\$0	\$100	0	\$25,000	\$0	0	\$1,800	\$100	18	\$0 \$1	00	0	\$0 \$	5100	0 0%	\$26,800
Permit Fees - Demo	\$0	\$100 (	0 \$0 \$100	0 0	\$0 \$100	0	\$0	\$100	0	\$0	\$0	0	\$0	\$100	0	\$0 \$1	00	0	\$0 \$	5100	0 0%	\$0
						-			-				-			-		-			-	\$82,300
Not Included																						
Wild Life Study																						
RF designs etc (H&D) separate estimate																						
Critical Slopes																						

Scenarios
1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required

Scenario #4 4. (High site) All new King County site compound (50x50) new shelter (10x 25), backup power and tower 180ft SS, road work required. Landuse and builing permit. Site zoning allows tower construction

Consultant	Towe	rs etc		ES A	&E	Survey	Civil	Legal/Site Acqu	uisition	Enviromental/Per	mitting		Electrical/RF design	Management		Geotech	MU	TOTAL
Design	sub total	rate	hrs	sub total	rate hrs													
Engineering Consultant project management	\$0		-		\$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100			\$100	0	\$32,000 \$20			\$100	0 0%	\$32,00
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Title Report	\$0	\$100			\$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100		\$700		7	\$0 \$10	0		\$100	0 15%	\$80
Property Survey (Site w/ 250ft of Road)	\$0	\$100			\$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100		\$0		0	\$0 \$10	0		\$100	0 15%	\$
Additional Road Survey (250ft to 2000ft)	\$0	\$100			\$100 0	\$8,000 \$100 80	\$0 \$100	0 \$0 \$100		\$0		0	\$0 \$10	0		\$100	0 15%	\$9,20
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Lease/ Lease Support																						
Purchase Land	\$0	\$100	0	\$0	\$100 (	\$0 \$100	) 0	\$0 \$1	00	0 \$0	\$0	0	\$0	\$100	0	\$0	\$100	0	\$ 0 \$100	) (	0%	\$0
Lease 50x 50 plot	\$0	\$100	0	\$0	\$100 (	\$0 \$10	0 (	\$0 \$1	00	0 \$173,357	\$0	0	\$0	\$100	0	\$0	\$100	0	\$ 0 \$100	) (	0%	\$173,357
New Lease/Lease Revision/Admin	\$0	\$100	0	\$0	\$100 (	\$0 \$100	) 0	\$0 \$1	00	0 \$10,000	\$0	0	\$2,500	\$100	25	\$0	\$100	0	\$ 0 \$100	) (	0%	\$12,500
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Permit Fees																						
Permit Fees Pre-Application	\$0	\$100	0	\$0	\$100 (	\$0 \$100	) 0	\$0 \$1	00	0 \$25,000	\$0	0	\$1,500	\$100	15	\$0	\$100	0	\$ 0 \$100	) (	0%	\$26,500
Permit Fees LU	\$0	\$100	0	\$0	\$100 (	\$0 \$100	) 0	\$0 \$1	00	0 \$25,000	\$0	0	\$4,000	\$100	40	\$0	\$100	0	\$ 0 \$100	) (	0%	\$29,000
Permit Fees BP	\$0	\$100	0	\$0	\$100 (	\$0 \$100	0 (	\$0 \$1	00	0 \$25,000	\$0	0	\$1,800	\$100	18	\$0	\$100	0	\$ 0 \$100	) (	0%0	\$26,800
Permit Fees - Demo	\$0	\$100	0	\$0	\$100 (	\$0 \$100	0 (	\$0 \$1	00	0 \$0	\$0	0	\$0	\$100	0	\$0	\$100	0	\$ 0 \$100	) (	0%	\$0
			-			-															-	\$82,300
Not Included																						
Wild Life Study																						
RF designs etc (H&D) separate estimate																						
Critical Slopes																						

Scenarios
1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required

Scenario #5 5. Existing King County site **new shelter** due to lack of space, backup power and tower unmodified. Added equipment racks and equipment to tower. Land use and builbding permit required.

Consultant	Towe	rs etc		ES A	&E	Surv	ey	C	ivil		Legal/Site	Acquisition	Enviromental/Permitting	Electrical/RF	design M	Management		Geotech	MU	TOTAL
Design	sub total	rate	hrs	sub total	rate h	irs														
Engineering Consultant project management	\$0	\$150	0	\$0	\$100	0 \$0	\$100	0 \$0	\$100	0	) \$0 \$	\$100	0 \$0 \$100 0	\$32,000	0 \$200	160	\$0	\$100	0 0%	\$32,00
Site Visits	\$1,000		10		\$100		\$100		\$100	0	÷ -	\$100	0 \$0 \$100 0	)	\$100			\$100	0 0%	\$1,00
Site Feasibility Study	\$0		0		\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(	-			\$100	0 15%	\$1,84
Site Visits (Sub Contractors)	\$0		0		\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(				\$100	0 15%	\$92
Lease Exhibit Drawings	\$0	4	0		\$100		\$100		\$100	0	· ·	\$100	0 \$0 \$100 0	) \$(				\$100	0 15%	\$92
Title Report	\$0		0		\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(				\$100	0 15%	\$
Property Survey (Site w/ 250ft of Road)	\$0		0		\$100	0 \$3,000			\$100	0	· ·	\$100	0 \$1,000 \$100 10	· • •				\$100	0 15%	\$4,60
Additional Road Survey (250ft to 2000ft)	\$0	\$100	0	\$0	\$100		\$100		\$100	0	0 \$0 \$	\$100	0 \$0 \$100 0	) \$(	0 \$100	0 0	\$0	\$100	0 15%	\$
Survey Coordination	\$0	\$100	0		\$100	0 \$0	\$100	0 \$0	\$100	0	0 \$0 \$	\$100	0 \$700 \$100 7	7 \$(	0 \$100	0 0	\$0	\$100	0 15%	\$80
NIER Report	\$0	\$100	0		\$100	0 \$0	\$100		\$100		0 \$0 \$	\$100	0 \$0 \$100 0	\$5,000	0 \$200	) 25	\$0	\$100	0 15%	\$5,75
Intermod Report	\$0	\$100	0	\$0	\$100	0 \$0	\$100	0 \$0	\$100	0	0 \$0 \$	\$100	0 \$0 \$100 0	\$16,000	0 \$200	) 80	\$0	\$100	0 15%	\$18,40
Noise Report	\$0	\$100	0	\$0	\$100	0 \$0	\$100	0 \$0	\$100	0	) \$0 \$	\$100	0 \$0 \$100 0	\$(	0 \$100	0 0	\$0	\$100	0 15%	\$
																				\$
Civil (Target Drainage)	\$0				\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(		-		\$100	0 15%	\$
Structural Tower Analysis	\$2,000	\$100			\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(				\$100	0 15%	\$2,30
Structural Existing Tower Inspection	\$2,000	\$100			\$100		\$100		\$100			\$100	0 \$0 \$100 0	) \$(				\$100	0 15%	\$2,30
Structural Tower Upgrade design	\$2,000	\$100	20		\$100		\$100		\$100			\$100	0 \$0 \$100 0	) \$0	- +		÷ -	\$100	0 15%	\$2,30
Geotechnical	\$0		0		\$100		\$100	0 \$5,500		55		\$100	0 \$1,000 \$100 10	- -	÷ ÷ • • •			\$100	0 15%	\$7,47
Project Design	\$3,000				\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$0	+			\$100	0 15%	\$3,45
Land Use Drawings	\$0	+			\$100		\$100		\$100	0		\$100	0 \$7,050 \$100 70.5		- +			\$100	0 15%	\$13,28
Building Permit Drawings	\$0				\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(	- +			\$100	0 15%	\$6,90
Bid Drawings	\$0	+	0	+ /	\$100		\$100		\$100	0		\$100	0 \$6,350 \$100 63.5		- +			\$100	0 15%	\$9,37
Construction Drawings	\$0		0	\$1,500			\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(	- +			\$100	0 15%	\$1,72
As built Drawings	\$0	+	0	\$1,500	\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(	÷ ÷ • • •			\$100	0 15%	\$1,72
Landscape Drawings	\$0	\$100	0	\$2,500	\$100	25 \$0	\$100	0 \$0	\$100	0	) \$0 S	\$100	0 \$0 \$100 0	) \$(	\$100	0 0	\$0	\$100	0 15%	\$2,87
Orounding drouingo	¢0	¢100	0	¢1 500	¢100	45 ¢0	¢100	0.00	¢100	0	<u>۴</u> ۵	¢100	0 \$0 \$100 0	) ¢(	0 ¢100		¢0	¢100	0 150/	\$
Grounding drawings	\$0		0		\$100		\$100		\$100 \$100			\$100 \$100		) \$(	- +			\$100	0 15%	\$1,72
Electrical drawings (one line)	\$0 \$0				\$100		\$100 \$100					\$100 \$100	0 \$0 \$100 0	5,500				\$100	0 15%	\$6,32
Bid Spec Coordination Elec designs and spec	\$0 \$0				\$100 \$100		\$100 \$100		\$100 \$100	0		\$100 \$100	0 \$0 \$100 0 0 \$0 \$100 0	) \$( ) \$(				\$100 \$100	0 15% 0 15%	\$( \$(
Mech designs and spec	\$0 \$0				\$100		\$100		\$100	0	<b>.</b>	\$100 \$100	0 \$0 \$100 0	) \$(				\$100	0 15%	\$
Building Specs	\$0 \$1,000		10		\$100		\$100		\$100	0		\$100 \$100	0 \$1,000 \$100 10	· • •	-			\$100	0 15%	\$2,30
Tower Specs	\$1,000				\$100		\$100		\$100	0		\$100 \$100	0 \$0 \$1,000 \$100 10	) \$(	-			\$100	0 15%	\$2,30
FAA/FCC Filings (Tower, Microwave & Land Mobile)	\$1,000				\$100		\$100		\$100	0		\$100 \$100	0 \$0 \$100 0	) \$10,500				\$100	0 15%	\$12,07
Owner supplied equipment bids (racks gens etc)	\$1,000				\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$10,300 ) \$(				\$100	0 15%	\$1,15
Enviromental Site Assessment (phase I)	\$0 \$0				\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(	-			\$100	0 15%	\$1,15
Road Design	\$0 \$0				\$100		\$100		\$100	0	÷ -	\$100	0 \$0 \$100 0	) \$(				\$100	0 15%	\$
Contruction Staking	\$0 \$0			φυ	\$100		\$100		\$100	0	÷ -	\$100	0 \$0 \$100 0	) \$(	÷ ÷ • • •		φυ	\$100	0 15%	\$
Construction Coordination	\$0 \$0			\$0	\$100		\$100		\$100	0	·	\$100	0 \$2,500 \$100 25	φ.	-		\$0	\$100	0 15%	\$2,87
Permit Applications	φυ	φ100		φυ	φ100	φ0	ψ100	φ0	ψισο	0	φυ (	φισσ	\$\$\$	φ	φιου	, 0	φυ	φ100	0 1070	<u>φ2,013</u>
BP -General meetings paperwork etc	\$2.000	\$100	20	\$1 200	\$100	12 \$0	\$100	0 \$0	\$100	0	) \$0 \$	\$100	0 \$6,300 \$100 63	3 \$0	0 \$100	) 0	\$0	\$100	0 15%	\$10,92
Pre-application Meetings	\$750				\$100		\$100		\$100			\$100	0 \$0 \$100 0	) \$(	-			\$100	0 15%	\$2,01
Public Notice Board	\$0		0		\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(	-			\$100	0 15%	\$
LU - General meetings paperwork etc	\$2,000		20				\$100		\$100	0	÷ -	\$100	0 \$7,100 \$100 71	\$0	-			\$100	0 15%	\$11,84
SEPA	\$0				\$100		\$100		\$100	0		\$100	0 \$0 \$100 0	) \$(				\$100	0 15%	\$
SHPO (FCC 612)	\$0				\$100		\$100		\$100	0		\$100	0 \$7,100 \$100 71	I \$0				\$100	0 15%	\$8,16
NEPA	\$0	\$100	0	\$0	\$100		\$100		\$100	0	) \$0 \$	\$100	0 \$2,650 \$100 26.5	5 \$0	0 \$100	) 0		\$100	0 15%	\$3,04
Public Hearings	\$0	\$100	0		\$100	0 \$0	\$100		\$100	0	\$0 \$	\$100	0 \$0 \$100 0	) \$(	0 \$100	) 0	\$0	\$100	0 15%	
Balloon Test	\$0				\$100		\$100	0 \$0	\$100	0	) \$0 \$	\$100	0 \$0 \$100 0	) \$(		0 0		\$100	0 15%	\$( \$(
Photos Sims	\$0			\$1,000	\$100		\$100	0 \$0	\$100	0	) \$0 \$		0 \$0 \$100 0	) \$(	0 \$100		\$0	\$100	0 15%	\$1,15
Building Permit Management	\$1,000	\$100	10		\$100		\$100	0 \$0	\$100	0	0 \$0 \$		0 \$500 \$100 5	5 \$0	0 \$100	0 0		\$100	0 15%	\$1,72
Project Management	\$0	\$100	0	\$0	\$100	0 \$0	\$100	0 \$0	\$100	0	) \$0 \$	\$100	0 \$1,000 \$100 10	) \$(	0 \$100	0 0	\$0	\$100	0 15%	\$1,15
Bids and Constuction																				\$(
Construction Admin	\$1,000	\$100	10	\$0	\$100	0 \$0	\$100		\$100		0 \$0 \$	\$100	0 \$2,000 \$100 20	\$0	0 \$100	0 0	\$0	\$100	0 15%	\$3,45
Bid Management	\$0	\$100	0	\$0	\$100	0 \$0	\$100	0 \$0	\$100	0	0 \$0 \$	\$100	0 \$10,000 \$100 100	\$0	0 \$100	0 0	\$0	\$100	0 15%	\$11,50
Construction Site visits	\$1,000				\$100		\$100		\$100			\$100	0 \$1,000 \$100 10					\$100	0 15%	\$2,30
As built Drawings	\$1,500				\$100		\$100		\$100			\$100	0 \$300 \$100 3		0 \$100			\$100	0 15%	\$2,07
OM Manual	\$0				\$100		\$100		\$100			\$100	0 \$200 \$100 2		0 \$100			\$100	0 15%	\$23
Full tower climb inspection and report (new towers)	\$2,000	\$100	20	\$0	\$100	0 \$0	\$100	0 \$0	\$100	0	) \$0 \$	\$100	0 \$0 \$100 0	\$	0 \$100	0	\$0	\$100	0 15%	\$2,30
Legal/																				\$
Legal Consultant	\$0				\$100		\$100		\$100			\$200	0 \$0 \$100 0	\$(				\$100	0 15%	\$
Site Acquisition Admin	\$0				\$100		\$100		\$100			\$100	0 \$2,000 \$100 20	) \$(				\$100	0 15%	\$2,30
Site Acquisition Consultant	\$0	\$100	0		\$100		\$100	0 \$0	\$100	0		\$100	0 \$0 \$100 0	) \$(				\$100	0 15%	\$
Print Fees	\$0	\$100	0		\$100		\$100		\$100	0	\$0	\$0	0 \$0 \$100 0	\$0	0 \$100			\$100	0 15%	\$
Design Total	\$24,250		243	\$26,900	2	269 \$3,000	3	0 \$5,500		55	5 \$0	\$0	0 \$59,750 597.5	5 \$69,000	0	372.5	\$0		0	\$211,71

Lease/ Lease Support																						
Purchase Land	\$0	\$100	0	\$0	\$100	0	\$0 \$100	0	\$0 \$1	00	0 \$0	\$ 60 0	0 \$0 \$	6100	0	\$0	\$100	0	\$ 0 \$100	(	0%	\$0
Lease 50x 50 plot	\$0	\$100	0	\$0	\$100	0	\$0 \$100	0	\$0 \$1	00	0 \$173,357	\$ 60 (	0 \$0 \$	6100	0	\$0	\$100	0	\$ 0 \$100	(	0%	\$173,357
New Lease/Lease Revision/Admin	\$0	\$100	0	\$0	\$100	0	\$0 \$100	0	\$0 \$1	00	0 \$10,000	\$ 0 0	0 \$2,500 \$	5100	25	\$0	\$100	0	\$ 0 \$100	(	0%	\$12,500
																						\$185,857
Permit Fees																						
Permit Fees - Pre-Application	\$0	\$100	0	\$0	\$100	0	\$0 \$100	0	\$0 \$1	00	0 \$25,000	\$ 60 (	0 \$1,500 \$	6100	15	\$0	\$100	0	\$ 0 \$100	(	0%	\$26,500
Permit Fees LU	\$0	\$100	0	\$0	\$100	0	\$0 \$100	0	\$0 \$1	00	0 \$0	\$ 0 0	0 \$4,000 \$	6100	40	\$0	\$100	0	\$ 0 \$100	(	0%	\$4,000
Permit Fees BP	\$0	\$100	0	\$0	\$100	0	\$0 \$100	0	\$0 \$1	00	0 \$25,000	\$ 60 (	0 \$800 \$	6100	8	\$0	\$100	0	\$ 0 \$100	(	0%	\$25,800
Permit Fees - Demo	\$0	\$100	0	\$0	\$100	0	\$0 \$100	0	\$0 \$1	00	0 \$0	\$ 0 0	0 \$0 \$	5100	0	\$0	\$100	0	\$ 0 \$100	(	0%	\$0
			-			_		_	•				-									\$56,300
Not Included																						
Wild Life Study																						
RF designs etc (H&D) separate estimate																						
Critical Slopes																						

Scenarios 1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required

Scenario #6 6. Existing King County site reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Added equipment racks and equipment to tower. Land use and building permit required. Land assumed to be zoned for tower.

Consultant	Towers etc		ES A&E	Survey	Civil	Legal/Site Acquisition	Enviromental/Permitting	Electrical/RF design Management	Geotech	м.	TOTAL
Design	sub total rate	hrs s	ub total rate hrs								
Engineering Consultant project management	\$0 \$150	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$150 0	\$0 \$100	0 0%	\$
Site Visits	\$1,000 \$100	10	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 0%	
Site Feasibility Study	\$0 \$100	0	\$1,600 \$100 16	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Site Visits (Sub Contractors)	\$0 \$100	0	\$800 \$100 8	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Lease Exhibt Drawings	\$0 \$100	0	\$800 \$100 8	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Title Report	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Property Survey (Site w/ 250ft of Road)	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$
Additional Road Survey (250ft to 2000ft)	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$
Survey Coordination	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$700 \$100 7	\$0 \$100 0	\$0 \$100	0 15%	
NIER Report	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	s \$
Intermod Report	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$
Noise Report	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$ \$
Civil (Target Drainage)	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	5 5
Civil (Target Drainage) Structural Tower Analysis	\$0 \$100	20	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100 0 \$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	\$0 \$100 0 \$0 \$100 0	\$0 \$100	0 15%	
Structural Existing Tower Inspection	\$2,000 \$100		\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	\$0 \$100 0 \$0 \$100 0	\$0 \$100	0 15%	
Structural Tower Upgrade design	\$0 \$100	20	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	. ,
Geotechnical	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	12 1 22	5 \$0 \$100	0 \$1,000 \$100 10	\$0 \$100 0 \$0 \$100 0	\$0 \$100	0 15%	م \$7,47
Project Design	\$4,000 \$100	40	\$0 \$100 0	\$0 \$100 0	\$0,500 \$100 \$	0 \$0 \$100	0 \$1,000 \$100 10	\$0 \$100 0 \$0 \$100 0	\$0 \$100	0 15%	5 \$7,473 5 \$4,60
Land Use Drawings	\$4,000 \$100	0	\$4.500 \$100 45	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$7,050 \$100 70.5	\$0 \$100 0	\$0 \$100	0 15%	5 \$4,00
Building Permit Drawings	\$0 \$100	0	\$6,000 \$100 60	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Bid Drawings	\$0 \$100	0	\$1,800 \$100 18	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$6,350 \$100 63.5	\$0 \$100 0	\$0 \$100	0 15%	. ,
Construction Drawings	\$0 \$100	0	\$1,500 \$100 15	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
As built Drawings	\$0 \$100	0	\$1,500 \$100 15	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$1,72
Landscape Drawings	\$0 \$100	0	\$2,500 \$100 25	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
	<b>T</b>										\$
Grounding drawings	\$0 \$100	0	\$1,500 \$100 15	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Electrical drawings (one line)	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Bid Spec Coordination	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$
Elec designs and spec	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$
Mech designs and spec	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$
Building Specs	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$1,000 \$100 10	\$0 \$100 0	\$0 \$100	0 15%	\$1,15
Tower Specs	\$1,000 \$100	10	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$1,15
FAA/FCC Filings (Tower, Microwave & Land Mobile)	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Owner supplied equipment bids (racks gens etc)	\$1,000 \$100	10	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$1,15
Enviromental Site Assessment (phase I)	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$
Road Design	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$
Contruction Staking	\$0 \$100	0	\$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$100 0	\$100	0 15%	s \$1
Construction Coordination	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$2,500 \$100 25	\$0 \$100 0	\$0 \$100	0 15%	\$2,87
Permit Applications											\$
General meetings paperwork etc	\$2,000 \$100	20	\$1,200 \$100 12	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	\$3,68
Pre-application Meetings	\$750 \$100	7.5	\$1,000 \$100 10	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	. ,
Public Notice Board	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	s \$1
LU - General meetings paperwork etc	\$2,000 \$100	20	\$1,200 \$100 12	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$7,100 \$100 71	\$0 \$100 0	\$0 \$100	0 15%	\$11,84
SEPA SHPO (FCC 612)	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$7,100 \$100 71	\$0 \$100 0	\$0 \$100	0 15%	\$8,16
NEPA	\$0 \$100 \$0 \$100	0	\$0 \$100 0 \$0 \$100 0	\$0 \$100 0 \$0 \$100 0	\$0 \$100 \$0 \$100	0 \$0 \$100 0 \$0 \$100	0 \$2,650 \$100 26.5 0 \$0 \$100 0	\$0 \$100 0 \$0 \$100 0	\$0 \$100 \$0 \$100	0 15%	5 \$3,04 5 \$0
NEPA Public Hearings	\$0 \$100	10	\$0 \$100 0 \$0 \$100 0	\$0 \$100 0 \$0 \$100 0	\$0 \$100 \$0 \$100	0 \$0 \$100 0 \$0 \$100	0 \$0 \$100 0 \$0 \$100 0	\$0 \$100 0 \$0 \$100 0	\$0 \$100	0 15%	
Ballon Test	\$1,000 \$100	10	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0 \$0 \$100 0	\$0 \$100 0 \$0 \$100 0	\$0 \$100	0 15%	
Photos Sims	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0 0 \$0 \$100 0	\$0 \$100 0 \$0 \$100 0	\$0 \$100	0 15%	
Building Permit Management	\$1,000 \$100	10	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$500 \$100 0 0 \$500 \$100 5	\$0 \$100 0 \$0 \$100 0	\$0 \$100	0 15%	
Project Management	\$0 \$100		\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$1,000 \$100 5 0 \$1,000 \$100 10		\$0 \$100	0 15%	
Bids and Constuction	ψυψιου	0	\$0 \$100 U	ψ0 φ100 0	\$0 \$100	\$0 \$100	0 \$1,000 \$100 10	\$0 \$100 0	φ0 φ100	0 1370	\$ \$1,15
Construction Admin	\$1,000 \$100	10	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$2,000 \$100 20	\$0 \$100 0	\$0 \$100	0 15%	
Bid Management	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$10,000 \$100 100		\$0 \$100	0 15%	
Construction Site visits	\$1,000 \$100	10	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$1,000 \$100 100	\$0 \$100 0	\$0 \$100	0 15%	
As built Drawings	\$1,500 \$100		\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$300 \$100 3	\$0 \$100 0	\$0 \$100	0 15%	
OM Manual	\$0 \$100	.0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$200 \$100 2	\$0 \$100 0	\$0 \$100	0 15%	
Full tower climb inspection and report (new towers)	\$2,000 \$100	20	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Legal/	Ţ_,500 \$100		<u>+</u>			· · · · · · · · · · · · · · · · · · ·			÷÷ ÷		\$
Legal Consultant	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$200	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Site Acquisition Admin	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$2,000 \$100 20		\$0 \$100	0 15%	
Site Acquisition Consultant	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$100	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Print Fees	\$0 \$100	0	\$0 \$100 0	\$0 \$100 0	\$0 \$100	0 \$0 \$0	0 \$0 \$100 0	\$0 \$100 0	\$0 \$100	0 15%	
Design Total	\$23,250	233	\$26,900 269	\$0 \$100 0		5 \$0 \$0	0 \$52,450 524.5		\$0 \$100	0 1070	\$124,16
Design Total	ψ20,200	200	ψ20,300 209	ψυ υ	ψ0,000	φυ φυ	φυ2,400 024.0	ψυ υ	ΨΟ	U	φι 244, Ι

Lease/ Lease Support																							
Purchase Land	\$0	\$100	0	\$0 \$	5100	0 \$0 \$10	0 0	\$0 \$100	0	\$0	\$0	0	\$0	\$100	0 0	\$0	\$100	0	\$0	\$100	0	0%	\$0
Lease 50x 50 plot	\$0	\$100	0	\$0 \$	5100	0 \$0 \$10	0 0	\$0 \$100	0	\$86,678	\$0	0	\$0	\$100	0 0	\$0	\$100	0	\$0	\$100	0	0%	\$86,678
New Lease/Lease Revision/Admin	\$0	\$100	0	\$0 \$	5100	0 \$0 \$10	0 0	\$0 \$100	0	\$10,000	\$0	0	\$2,500	\$100	) 25	\$0	\$100	0	\$0	\$100	0	0%	\$12,500
																							\$99,178
Permit Fees																							
Permit Fees Pre-Application	\$0	\$100	0	\$0 \$	5100	0 \$0 \$10	0 0	\$0 \$100	0	\$0	\$0	0	\$1,500	\$100	) 15	\$0	\$100	0	\$0	\$100	0	0%	\$1,500
Permit Fees LU	\$0	\$100	0	\$0 \$	5100	0 \$0 \$10	0 0	\$0 \$100	0	\$25,000	\$0	0	\$4,000	\$100	0 40	\$0	\$100	0	\$0	\$100	0	0%	\$29,000
Permit Fees BP	\$0	\$100	0	\$0 \$	5100	0 \$0 \$10	0 0	\$0 \$100	0	\$25,000	\$0	0	\$1,200	\$100	) 12	\$0	\$100	0	\$0	\$100	0	0%	\$26,200
Permit Fees - Demo	\$0	\$100	0	\$0 \$	5100	0 \$0 \$10	0 0	\$0 \$100	0	\$0	\$0	0	\$500	\$100	) 5	\$0	\$100	0	\$0	\$100	0	0%	\$500
			-						-		•	-				-	-				-		\$57,200
Not Included																							
Wild Life Study																							
RF designs etc (H&D) separate estimate																							
Critical Slopes																							

Scenarios 1. Existing King County site: reuse existing shelter, backup power and tower/rooftop unmodified. Add equipment racks and equipment to tower

2. Existing King County site: reuse existing shelter, backup power and tower structural modification required. Add equipment racks and equipment to tower.

3. (Lowland site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

3. (High site) All new King County site compound (50' x 50'), new shelter (10' x 25'), backup power and tower - 180ft SS

5. Existing King County site: new shelter due to lack of space, backup power and tower unmodified. Add equipment racks and equipment to tower

6. Existing King County site: reuse existing shelter, backup power, demo existing tower all new 180ft SS tower. Add equipment racks and equipment to tower.

Additional Assumptions:

Site topography such that retaining walls and other site stabilization measures not required

King County P25 Phase 2 Radio System Cost Estimate

## Sheet 3 - King County P25 Radio System Site Equipment Cost Estimate

King County P25 Radio System Cost Estimate Master Site, Prime Sites, and Remote Repeater Sites Site Distribution Assumptions

		Estimated	Т	otal Equipment
		Equipment Cost		Cost Per Site
Site Category	Quantity	Per Site		Category
Master	2	\$1,250,000.00	\$	2,500,000.00
Total Master Sites	2		\$	2,500,000.00
Simulcast Prime Site - 800 MHz Urban Area Simulcast Systems	4	\$ 914,197.00	\$	3,656,788.00
Simulcast Prime Site - 800 MHz Transportation Corridors ("HWYS")	3	\$ 524,197.00	\$	1,572,591.00
Simulcast Prime Site - VHF/UHF Simulcast System	1	\$ 446,197.00	\$	446,197.00
Total Simulcast Prime Sites	8		\$	5,675,576.00
Transportation Corridor ("HWYS") Site - 800 MHz Only Site	6	\$ 532,547.96	\$	3,195,287.76
Transportation Corridor ("HWYS") Site - 800 MHz/UHF/VHF Site	6	\$ 755,950.08	\$	4,535,700.48
Urban Area 28-Channel Simulcast Site - 800 MHz Only	40	\$1,398,884.90	\$	55,955,396.00
Urban Area 28-Channel Simulcast Site - With UHF/VHF	4	\$1,622,287.02	\$	6,489,148.08
Total Remote Repeater Sites	56		\$	70,175,532.32

#### MASTER SITE

1	Y MASTER SITE MASTER SITE CONFIGURATION 7.9 ZC/NM HW 24 SITES OR LESS	\$40,000.00	DISCOUNT 0%	KC PRICE \$0.00 \$40,000.00
1	7.9 REDUNDANT ZC HW 24 SITE OR LESS HIGH AVAILABILITY ZC LICENSE	\$40,000.00 \$10,000.00	0%	\$40,000.00 \$10,000.00
1 1	DUAL COMMON PLATFORM HARDWARE MAX 24 SITES STORAGE DEVICE		0% 0%	\$0.00 \$0.00
1	WINDOWS SUPPLEMENTAL TRANS CONFIG		0%	\$0.00
58	P25 Phase 2 TDMA Operation site LICENSE (includes site-level Ph1 IVD license)		0%	\$0.00
1	P25 Phase 2 TDMA Operation (includes zone-level Ph1 IVD license)		0%	\$0.0
1	ANTI-VIRUS SERVICE (SERVERS) BASELINE BACK UP	<b>\$</b> 5,000,00	0%	\$0.00 \$0.00
11 6	500 RADIO USER LICENSES MCC 7500 CONSOLE LICENSES (QTY 5)	\$5,000.00 \$5,000.00		\$55,000.00 \$30,000.00
2	ANTI-VIRUS SERVICE SYMANTEC ENDPOINT PROTECTION V11.0 CORP ED LIC & MEDIA SINGLE COPY	\$500.00	0%	\$1,000.00
1	UNIFIED NETWORK CONFIGURATOR (UNC)	\$75.00 \$20,000.00		\$75.00 \$20,000.00
1	USER CONFIGURATION MANAGER (UCM) UNIFIED EVENT MANAGER (UEM)	\$5,000.00 \$20,000.00	0%	\$5,000.00 \$20,000.00 \$20,000.00
1	EMAIL ALARM NOTIFICATIONS ZONEWATCH	\$5,000.00 \$20,000.00	0%	\$5,000.0 \$20,000.0
1	ZONE HISTORICAL REPORTS DYNAMIC REPORTS	\$5,000.00	0%	\$5,000.0 \$5,000.0 \$8,000.0
1	RADIO CONTROL MANAGER AFFILIATION USER REPORTS	\$15,000.00 \$7,000.00	0%	\$15,000.0 \$7,000.0
1	CERTIFIED NETWORK MANAGEMENT ASTRO 7.5/7.6/7.7/7.8-REPL BY DDN9977A REPL BY DDN9977A		0%	\$0.0
1	ASTRO 7.9 CLIENT APPLICATION SOFTWARE		0%	\$0.0
1	CRYSTAL REPORTS 2008 (VISTA COMPATIBLE; FOR A7.5 & BEYOND) 19" LCD, BLACK, NON-TOUCH	\$994.00 \$1,520.00		\$994.0 \$1,520.0
1	CERTIFIED KEYBOARD FOR RSD SERVERS AND WORKSTATIONS	\$42.00		\$42.0
1	CERTIFIED OPTICAL WHEEL MOUSE FOR RSD SERVERS AND WORKSTATIONS	\$30.00	0%	\$30.0
1	2610-24 ETHERNET SWITCH	\$2,250.00	0%	\$2,250.0
1 1	S6000 MNR MULTI-PROTOCOL ROUTER S6000 4 PORT ULTRAWAN II MODULE	\$15,995.00 \$3,000.00		\$15,995.0 \$3,000.0
1 1	S6000 MNR MULTI-PROTOCOL ROUTER S6000 4 PORT ULTRAWAN II MODULE	\$15,995.00 \$3,000.00	0% 0%	\$15,995.0 \$3,000.0
1	PRIME/MASTER SITE CONFIG AC POWER	\$34,712.00	0% 0%	\$0.0 \$34,712.0
50 4	CABLE: 1/4" SUPERFLEX POLY JKT PER FOOT 1/4" TYPE N MALE CONNECTOR FOR FSJ1-50A CABLE	\$1.95 \$27.25	0% 0%	\$97.5 \$109.0
1	SRC7500 SWG ROUTING CENTER	\$1,000.00	0% 0%	0.0\$ \$1,000.0
1 1	ADD: DUAL CORE LAN 1-24 SITES ADD: DUAL GATEWAY ROUTERS STANDARD	\$13,900.00 \$31,400.00	0% 0%	\$13,900.0 \$31,400.0
1 1	ADD: RED CORE ROUTER 1-24 SITES CWR ADD: DUAL LINK 1 PAIR CWR		0% 0%	\$0.0 \$0.0
1	ISSI GATEWAY WITH 3 PORTS	\$239,640.50	0%	\$239,640.5
2	KVL 4000 KEYLOADER		0%	\$0.0
2	INT: KMF OPERATION ADD: ASTRO 25 MODE		0% 0%	\$0.0 \$0.0
2	ADD: ASN MODE ADD: AC LINE CORD US		0% 0%	\$0.0 \$0.0
2	ADD: ADP PRIVACY ADD: KEYLOAD CABLE FOR APX PORTABLE		0% 0%	\$0.0 \$0.0
2	ADD: USB COMM/CHARGE CABLE W/CUP CABLE KEYLOAD MX		0%	\$0.0 \$0.0
4 4	ADD: CABLE FOR RNC, DIU, MGEG KEYLOADING CABLE ADAPTER (GCAI)		0% 0%	\$0.0 \$0.0
1	SEVEN AND A HALF FOOT RACK	\$495.00	0%	\$495.0 \$4,950.0
5	POWER DIST. UNIT SURGE PROTECT 120V RACK MT ADAPTER PLATES, 19 IN FOR DSOP820B, DSOP820B2 & DSNSOP820B	\$990.00 \$101.00	0%	\$4,950.0
5 26	EIGHT WIRE PROTECTION MODULE WITH RJ-48 PASS THROUGH & MECH GRD CONN	\$154.00		\$4,004.0
5	HORIZONTAL RACK BUS BAR FOR TSJ AND WPH SERIES NETWORK PROTECTOR	\$88.00		\$440.0
1	SITE MANAGER ADVANCED	\$3,000.00	0%	\$3,000.0
1	ADD: 90VAC TO 260VAC PS TO SM SDM3000 ASTRO F/W FOR A7.9	\$1,850.00 \$1,850.00	0%	\$1,850.0 \$1,850.0
3	AAD TERM BLCK & CONN WI	\$90.00		\$270.0
1 1	RTU_PER_DEVICE_SW_LICENSES RTU_SW_LIC_PER_NFM-RTU_I-O	\$75.00 \$90.00		\$75.0 \$90.0
1	RTU_SW_LIC_PER_TRAK_GPS	\$90.00		\$90.0
1 1	SITE MANAGER ADVANCED 90VAC TO 260VAC PS TO SM	\$3,000.00 \$120.00	0% 0%	\$3,000.0 \$120.0
1	SDM3000 ASTRO F/W FOR A7.9	\$1,850.00	0%	\$1,850.0
1 32	RTU_PER_DEVICE_SW_LICENSES RTU_SW_LIC_PER_HARRIS_M-W_ RADIO	\$75.00 \$270.00		\$75.0 \$8,640.0
1 32	GMC_PER_DEVICE_SW_LICENSES GMC_SW_LIC_PER_HARRIS_M-W_ RADIO	\$75.00 \$270.00		\$75.0 \$8,640.0
1	MASTER SYSTEM KEY PACKAGE FOR THE ADVANCED SYSTEM KEY CPS FEATURE		0%	\$0.0
1	TORQUE WRENCH KIT FOR 7-16 DIN & TYPE N COUPLING NUTS	\$199.00	0% 0%	\$199.0
	ANAGEMENT			
1 1	MOSCAD NFM VIRTUAL APPLIANCE SITE MANAGER ADVANCED	\$28,453.00 \$3,000.00	0% 0%	\$28,453.0 \$3,000.0
1 1	ADD: 90VAC TO 260VAC PS TO SM SDM3000 NETWORK TRANSLATOR ASTRO F/W FOR A7.9	\$120.00 \$1,850.00		\$120.0 \$1,850.0
1	Z400 HIGH TIER WORKSTATION	\$5,950.00		\$5,950.0
1 1	19" LCD, BLACK, NON-TOUCH INTOUCH RUNTIME 60K TAG W/O-I/O, V10.1, LIC ONLY	\$1,520.00	0% 0%	\$1,520.0 \$0.0
1	SYMANTEC ENDPOINT PROTECTION V11.0 CORP ED LIC & MEDIA SINGLE COPY	\$8,700.00	0%	\$8,700.0
1	NFM FOR A7.9 DOCUMENTATION	\$20.00		\$20.0
1	SDM3000 BUILDER SOFTWARE FOR A7.9	\$800.00	0%	\$800.0
1 1	GMC_PER_DEVICE_SW_LICENSES GMC_SW_LIC_PER_NFM-RTU_I-O	\$75.00 \$90.00	0%	\$75.0 \$90.0
1	GMC_SW_LIC_PER_TRAK_GPS	\$90.00		\$90.0
58 58	GMC_PER_DEVICE_SW_LICENSES GMC_SW_LIC_PER_NFM-RTU_I-O	\$75.00 \$90.00	0%	\$4,350.0 \$5,220.0
58	SW,GMC_SW_LIC_PER_RFDS		0%	\$0.0
1 1	48 VDC RECTIFIER/DC DISTRIBUTION SYSTEM 48 VDC VRLA BATTERY PLANT	\$36,680.00 \$45,000.00	0%	\$36,680.0 \$45,000.0
	48 VDC WIRING	\$12,000.00		\$12,000.0
1	SPILL CONTAINMENT	\$5,000.00		\$5,000.0
1	SPILL CONTAINMENT HIGH-SEISMIC RACK ADJUSTMENT FOR EQUIPMENT/FIRMWARE/SOFTWARE COSTS NOT	\$5,000.00 \$2,000.00		\$5,000.0 \$2,000.0

#### URBAN AREA 800 MHZ SIMULCAST PRIME SITE

	PRIME SITE GCP 8000 SITE CONTROLLER CHASSIS GCP 8000 ISTE CONTROLLER	UNIT PRICE \$3,000.00 \$5,000.00	DISCOUNT 0%	KC PRICE \$3,000.00 \$5,000.00
1   1 F	POP SOUTING CONTROLLER PASED MULTISITE SITE CONTROLLER SOFTWARE RACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$3,000.00 \$62,500.00 \$0.00 \$0.00	0% 0%	\$3,000.00 \$62,500.00 \$0.00 \$0.00
1 (	GCP 8000 SITE CONTROLLER CHASSIS GCP 8000 ISTE CONTROLLER P BASED MULTISITE SITE CONTROLLER SOFTWARE	\$3,000.00 \$5,000.00 \$62,500.00	0%	\$3,000.00 \$5,000.00 \$62,500.00
1 F	PACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00 \$0.00 \$0.00
2 ( 2	GMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR P BASED MULTISITE OPERATION	\$3,000.00 \$5,000.00 \$9,000.00	0% 0% 0%	\$3,000.00 \$10,000.00 \$18,000.00
1 F	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$4,000.00 \$0.00 \$0.00	0% 0% 0%	\$8,000.00 \$0.00 \$0.00
2 (	GMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR P BASED MULTISITE OPERATION	\$3,000.00 \$5,000.00 \$9,000.00	0% 0% 0%	\$3,000.00 \$10,000.00 \$18,000.00
2 F 1 F	PERSECTION OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$3,000.00 \$4,000.00 \$0.00 \$0.00	0% 0%	\$13,000.00 \$8,000.00 \$0.00 \$0.00
1 (	GMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR	\$3,000.00	0% 0%	\$3,000.00 \$10,000.00
2 F 1 F	P BASED MULTISITE OPERATION P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$9,000.00 \$4,000.00 \$0.00	0%	\$18,000.00 \$8,000.00 \$0.00
1 (	POWER CABLE, DC (INCLUDED IN UNIT COST)  SMC 8000 COMPARATOR CHASSIS	\$0.00	0%	\$0.00
2 I 2 F	GMC 8000 COMPARATOR P BASED MULTISITE OPERATION 225 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$5,000.00 \$9,000.00 \$4,000.00 \$0.00		\$10,000.00 \$18,000.00 \$8,000.00
1 F	POWER CABLE, DC (INCLUDED IN UNIT COST) SMC 8000 COMPARATOR CHASSIS	\$0.00	0% 0%	\$0.00 \$0.00 \$3,000.00
2 0 2 1	SMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR P BASED MULTISITE OPERATION P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1)	\$3,000.00 \$5,000.00 \$9,000.00 \$4,000.00	0%	\$3,000.00 \$10,000.00 \$18,000.00 \$8,000.00
1 F	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00 \$0.00	0%	\$0.00 \$0.00
2 ( 2	GMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR P BASED MULTISITE OPERATION	\$3,000.00 \$5,000.00 \$9,000.00	0%	\$3,000.00 \$10,000.00 \$18,000.00
1 F	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$4,000.00 \$0.00 \$0.00	0% 0% 0%	\$8,000.00 \$0.00 \$0.00
2 0	GMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR P BASED MULTISITE OPERATION	\$3,000.00 \$5,000.00 \$9,000.00	0%	\$3,000.00 \$10,000.00 \$18,000.00
2 F 1 F	P BASED MULTISTIE OPERATION 225 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$9,000.00 \$4,000.00 \$0.00 \$0.00	0% 0%	\$18,000.00 \$8,000.00 \$0.00 \$0.00
1 (	SMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR	\$3,000.00		\$3,000.00 \$10,000.00
2   2 F 1 F	P BASED MULTISITE OPERATION P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$9,000.00 \$4,000.00 \$0.00	0% 0%	\$18,000.00 \$8,000.00 \$0.00
1 (	POWER CABLE, DC (INCLUDED IN UNIT COST)  GMC 8000 COMPARATOR CHASSIS	\$0.00	0%	\$0.00 \$3,000.00
2   2 F	GMC 8000 COMPARATOR P BASED MULTISITE OPERATION 225 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$5,000.00 \$9,000.00 \$4,000.00 \$0.00	0% 0% 0%	\$10,000.00 \$18,000.00 \$8,000.00 \$0.00
1 F	POWER CABLE, DC (INCLUDED IN UNIT COST) SMC 8000 COMPARATOR CHASSIS	\$0.00		\$0.00
2 0 2 1	GMC 8000 COMPARATOR P BASED MULTISITE OPERATION P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1)	\$5,000.00 \$9,000.00 \$4,000.00	0%	\$10,000.00 \$18,000.00 \$8,000.00
1 F	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00 \$0.00		\$0.00 \$0.00
2 0 2 1	GMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR P BASED MULTISITE OPERATION	\$3,000.00 \$5,000.00 \$9,000.00		\$3,000.00 \$10,000.00 \$18,000.00
1 F	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$4,000.00 \$0.00 \$0.00		\$8,000.00 \$0.00 \$0.00
2 0	GMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR P BASED MULTISITE OPERATION	\$3,000.00 \$5,000.00 \$9,000.00	0% 0% 0%	\$3,000.00 \$10,000.00 \$18,000.00
2 F 1 F	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST) POWER CABLE, DC (INCLUDED IN UNIT COST)	\$4,000.00 \$0.00 \$0.00	0% 0%	\$8,000.00 \$0.00 \$0.00
2 0	GMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR	\$3,000.00 \$5,000.00	0%	\$3,000.00 \$10,000.00
2 F 1 F	P BASED MULTISITE OPERATION 225 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$9,000.00 \$4,000.00 \$0.00	0% 0%	\$18,000.00 \$8,000.00 \$0.00
1 (	POWER CABLE, DC (INCLUDED IN UNIT COST)  GMC 8000 COMPARATOR CHASSIS GMC 8000 COMPARATOR	\$0.00 \$3,000.00 \$5,000.00	0%	\$0.00 \$3,000.00 \$10,000.00
2 I 2 F	PASED MULTISITE OPERATION P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1) RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$9,000.00 \$4,000.00 \$0.00	0%	\$18,000.00 \$8,000.00 \$0.00
F	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
4 F 4 F	7.5' RACK POWER DIST. UNIT SURGE PROTECT 120V RACK MOUNT ADAPTER PALTES 19 IN FOR DSOP820B,DSOP820B2, DSNSOP820B	\$495.00 \$990.00 \$101.00	0% 0%	\$1,485.00 \$3,960.00 \$404.00
4 H	3 WIRE PROTECTION MUDULE WITH RJ-28 PASS THROUGH & MECH GRD CONN HORIZONTAL RACK BUS BAR FOR TSJ AND WPH SERIES NETWORK PROTECTOR	\$154.00 \$88.00	0%	\$3,388.00 \$352.00
2 F 1 S	GGM 8000 GATEWAY POWER CABLE, DC (INCLUDED IN UNIT COST) SRC 24 PORT T1/E1 EXP II CO-OP WAN ROUTER RELAY PANEL	\$4,200.00 \$0.00 \$7,500.00	0% 0% 0%	\$8,400.00 \$0.00 \$0.00 \$15,000.00
1 S	SITE MANAGER 90VAC TO 260VAC PS TO SM	\$3,000.00 \$120.00	0% 0%	\$3,000.00 \$120.00
1 S 3 T	SDM3000 ASTRO F/W FOR A7.9 FERM BLOCK	\$1,850.00 \$90.00		\$1,850.00 \$270.00
1 S	3500 ETHERNET SWITCH S6000 MNR MULTI-PROTOCOL ROUTER S6000 4 PORT ULTRAWAN II MODULE	3,600.00 15,995.00 3,000.00		14,400.00 15,995.00 3,000.00
1 5	S6000 MNR MULTI-PROTOCOL ROUTER S6000 4 PORT ULTRAWAN II MODULE	15,995.00 3,000.00	0%	15,995.00 3,000.00
1 <i>F</i>	3PS FREQUENCY REFERENCE ANTENNA KIT FOR 8900 W/ 100' CABLE, GROUNDING, LIGHTNING SUPRESSOR 18 VDC RECTIFIER/DC DISTRIBUTION SYSTEM	\$34,712.00 \$1,186.00 \$36,680.00	0% 0% 0%	\$34,712.00 \$1,186.00 \$36,680.00
1 4 1 4	18 VDC RECTIFIERDE DISTRIBUTION SYSTEM 18 VDC VRLA BATTERY PLANT 18 VDC WIRING PILL CONTAINMENT	\$36,680.00 \$45,000.00 \$12,000.00 \$5,000.00	0% 0%	\$36,680.00 \$45,000.00 \$12,000.00 \$5,000.00
	HIGH-SEISMIC RACK	\$2,000.00	0% 0% Total	\$3,000.00 \$2,000.00 \$914,197.00

#### 800 MHz SIMULCAST PRIME SITE - TRANSPORTATION CORRIDORS

QUANTITY	PRIME SITE	UNIT PRICE	DISCOUNT	KC PRICE
1	GCP 8000 SITE CONTROLLER CHASSIS	\$3,000.00		\$3,000.00
1	GCP 8000 ISTE CONTROLLER	\$5,000.00		
1	IP BASED MULTISITE SITE CONTROLLER SOFTWARE	\$62,500.00		. ,
1	RACK MOUNT HARDWARE	\$0.00		\$0.00
1	POWER CABLE, DC	\$0.00		\$0.00
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1	GCP 8000 SITE CONTROLLER CHASSIS	\$3,000.00	0%	\$3,000.00
1	GCP 8000 ISTE CONTROLLER	\$5,000.00		
1	IP BASED MULTISITE SITE CONTROLLER SOFTWARE	\$62,500.00		\$62,500.00
1	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$02,500.00		\$0.00
1	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00		\$0.00
	FOWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	φ0.00
4		¢2,000,00	00/	¢2,000,00
1	GMC 8000 COMPARATOR CHASSIS	\$3,000.00		\$3,000.00
2	GMC 8000 COMPARATOR	\$5,000.00		. ,
2	IP BASED MULTISITE OPERATION	\$9,000.00		. ,
2	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1)	\$4,000.00		\$8,000.00
1	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$0.00		\$0.00
1	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
1	GMC 8000 COMPARATOR CHASSIS	\$3,000.00	0%	\$3,000.00
2	GMC 8000 COMPARATOR	\$5,000.00		
2	IP BASED MULTISITE OPERATION	\$9,000.00		\$18,000.00
2	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1)	\$4,000.00		\$8,000.00
1	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$0.00		\$0.00
1	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00		\$0.00
1			0%	
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1	GMC 8000 COMPARATOR CHASSIS	\$3,000.00		. ,
2	GMC 8000 COMPARATOR	\$5,000.00		. ,
2	IP BASED MULTISITE OPERATION	\$9,000.00		\$18,000.00
2	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1)	\$4,000.00		\$8,000.00
1	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
1	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
1	GMC 8000 COMPARATOR CHASSIS	\$3,000.00	0%	\$3,000.00
2	GMC 8000 COMPARATOR	\$5,000.00		\$10,000.00
2	IP BASED MULTISITE OPERATION	\$9,000.00		\$18,000.00
2	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1)	\$4,000.00		\$8,000.00
1		\$0.00		
1	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)			\$0.00
1	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
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3	7.5" RACK	\$495.00		\$1,485.00
4	POWER DIST. UNIT SURGE PROTECT 120V	\$990.00		\$3,960.00
4	RACK MOUNT ADAPTER PALTES 19 IN FOR DSOP820B, DSOP820B2, DSNSOP820B	\$101.00		\$404.00
22	8 WIRE PROTECTION MUDULE WITH RJ-28 PASS THROUGH & MECH GRD CONN	\$154.00	0%	\$3,388.00
4	HORIZONTAL RACK BUS BAR FOR TSJ AND WPH SERIES NETWORK PROTECTOR	\$88.00	0%	\$352.00
2	GGM 8000 GATEWAY	\$4,200.00	0%	\$8,400.00
2	DC POWER	\$0.00		\$0.00
1	SRC 24 PORT T1/E1 EXP II	\$0.00	0%	\$0.00
2	CO-OP WAN ROUTER RELAY PANEL	\$7,500.00		\$15,000.00
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1	SITE MANAGER	\$3,000.00	0%	\$3,000.00
1	90VAC TO 260VAC PS TO SM	\$3,000.00		
				\$120.00
1	SDM3000 ASTRO F/W FOR A7.9	\$1,850.00		\$1,850.00
3	TERM BLOCK	\$90.00	0%	\$270.00
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4	3500 ETHERNET SWITCH	3,600.00		14,400.00
1	S6000 MNR MULTI-PROTOCOL ROUTER	15,995.00		15,995.00
1	S6000 4 PORT ULTRAWAN II MODULE	3,000.00	0%	3,000.00
1	S6000 MNR MULTI-PROTOCOL ROUTER	15,995.00	0%	15,995.00
1	S6000 4 PORT ULTRAWAN II MODULE	3,000.00	0%	3,000.00
			1	
1	GPS FREQUENCY REFERENCE	\$34,712.00	0%	\$34,712.00
ļ	ANTENNA KIT FOR 8900 W/ 100' CABLE, GROUNDING, LIGHTNING SUPRESSOR	\$1,186.00		\$1,186.00
1		ψ1,100.00	078	ψ1,100.00
•			L	\$36,680.00
1		¢26 600 00	<u>^0/</u>	
1 1	48 VDC RECTIFIER/DC DISTRIBUTION SYSTEM	\$36,680.00		
1 1 1 1	48 VDC VRLA BATTERY PLANT	\$45,000.00	0%	\$45,000.00
1 1 1 1 1	48 VDC VRLA BATTERY PLANT 48 VDC WIRING	\$45,000.00 \$12,000.00	0% 0%	\$45,000.00 \$12,000.00
1 1 1 1 1 1	48 VDC VRLA BATTERY PLANT 48 VDC WIRING SPILL CONTAINMENT	\$45,000.00 \$12,000.00 \$5,000.00	0% 0% 0%	\$45,000.00 \$12,000.00 \$5,000.00
1 1 1 1 1	48 VDC VRLA BATTERY PLANT 48 VDC WIRING	\$45,000.00 \$12,000.00	0% 0% 0%	\$45,000.00 \$12,000.00
1 1 1 1 1 1	48 VDC VRLA BATTERY PLANT 48 VDC WIRING SPILL CONTAINMENT	\$45,000.00 \$12,000.00 \$5,000.00	0% 0% 0%	\$45,000.00 \$12,000.00 \$5,000.00

#### VHF/UHF SIMULCAST PRIME SITE

QUANTITY	PRIME SITE	UNIT PRICE	DISCOUNT	KC PRICE
	GCP 8000 SITE CONTROLLER CHASSIS	\$3,000.00	0%	\$3,000.00
1	GCP 8000 ISTE CONTROLLER	\$5,000.00	0%	\$5,000.00
1	IP BASED MULTISITE SITE CONTROLLER SOFTWARE	\$62,500.00	0%	\$62,500.00
1	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
1	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
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1	GCP 8000 SITE CONTROLLER CHASSIS	\$3,000.00	0%	\$3,000.00
1	GCP 8000 ISTE CONTROLLER	\$5,000.00	0%	\$5,000.00
1	IP BASED MULTISITE SITE CONTROLLER SOFTWARE	\$62,500.00	0%	\$62,500.00
1	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
1	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
	GMC 8000 COMPARATOR CHASSIS	\$3,000.00	0%	\$3,000.00
2	GMC 8000 COMPARATOR	\$5,000.00	0%	\$10,000.00
2	IP BASED MULTISITE OPERATION	\$9,000.00	0%	\$18,000.00
2	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1)	\$4,000.00	0%	\$8,000.00
1	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
1	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
4		<b>#0.000.00</b>	0.01	<b>MO 000 00</b>
1	GMC 8000 COMPARATOR CHASSIS	\$3,000.00	0%	\$3,000.00
2	GMC 8000 COMPARATOR	\$5,000.00	0%	\$10,000.00
2	IP BASED MULTISITE OPERATION	\$9,000.00	0%	\$18,000.00
2	P25 PHASE 2 TDMA OPERATION (INCLUDES PHASE 1)	\$4,000.00	0%	\$8,000.00
	RACK MOUNT HARDWARE (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
1	POWER CABLE, DC (INCLUDED IN UNIT COST)	\$0.00	0%	\$0.00
3	7.5" RACK	\$495.00	0%	\$1,485.00
	POWER DIST. UNIT SURGE PROTECT 120V	\$990.00		\$3,960.00
	RACK MOUNT ADAPTER PALTES 19 IN FOR DSOP820B,DSOP820B2, DSNSOP820B	\$101.00	0%	\$404.00
	8 WIRE PROTECTION MUDULE WITH RJ-28 PASS THROUGH & MECH GRD CONN	\$154.00	0%	\$3,388.00
	HORIZONTAL RACK BUS BAR FOR TSJ AND WPH SERIES NETWORK PROTECTOR	\$88.00	0%	\$352.00
2	GGM 8000 GATEWAY	\$4,200.00	0%	\$8,400.00
2	DC POWER	\$0.00	0%	\$0.00
1	SRC 24 PORT T1/E1 EXP II		0%	\$0.00
2	CO-OP WAN ROUTER RELAY PANEL	\$7,500.00	0%	\$15,000.00
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1	SITE MANAGER	\$3,000.00	0%	\$3,000.00
1	90VAC TO 260VAC PS TO SM	\$120.00	0%	\$120.00
1	SDM3000 ASTRO F/W FOR A7.9	\$1,850.00	0%	\$1,850.00
3	TERM BLOCK	\$90.00	0%	\$270.00
4	3500 ETHERNET SWITCH	3,600.00	0%	14,400.00
1	S6000 MNR MULTI-PROTOCOL ROUTER	15,995.00	0%	15,995.00
1	S6000 4 PORT ULTRAWAN II MODULE	3,000.00	0%	3,000.00
1	S6000 MNR MULTI-PROTOCOL ROUTER	15.995.00	0%	15,995.00
1	S6000 4 PORT ULTRAWAN II MODULE	3,000.00	0%	3,000.00
		3,000.00	078	3,000.00
1	GPS FREQUENCY REFERENCE	\$34,712.00	0%	\$34,712.00
1	ANTENNA KIT FOR 8900 W/ 100' CABLE, GROUNDING, LIGHTNING SUPRESSOR	\$1,186.00	0%	\$1,186.00
1	48 VDC RECTIFIER/DC DISTRIBUTION SYSTEM	\$36,680.00	0%	\$36,680.00
	48 VDC VRLA BATTERY PLANT	\$45,000.00		\$45,000.00
1	48 VDC WIRING	\$12,000.00	0%	\$12,000.00
1	SPILL CONTAINMENT	\$5,000.00		\$5,000.00
1	HIGH-SEISMIC RACK	\$2,000.00	0%	\$2,000.00
			Tatal	¢440.407.00
			Total	\$446,197.00

#### URBAN AREA TRUNKED SIMULCAST SITE - 800 MHz

UANTIT	Y TRUNKING SIMULCAST GPS TIMING ANTENA/RECEIVER	UNIT PRICE \$1,090.00		KC PRICE \$2,180.0
2 2	MOUNTING KIT FOR GPS ANTENNA HPD GPS SURGE PROTECTOR 48 VDC	\$90.00	0%	\$1,250.0 \$1,250.0
2	125' OUTDOOR UV PROTECTED CABLE 6PR, 22 AWG DB15	\$530.00		\$1,060.0
1 6	GTR 8000 EXPANDABLE SITE SUBSYSTEM 700/800 MHZ MID POWER	\$6,000.00 \$6,300.00	0% 0%	\$6,000.0 \$37,800.0
6	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE GTR 8000 BASE RADIOS	\$4,000.00	0%	\$24,000.0 \$71,400.0
6 1	IP BASED MULTISITE BASE RADIO SOFTWARE SITE & CABINET RMC W/CAPABILITY OF 7-24 BRS	\$16,700.00	0%	\$100,200.0 \$2,100.0
1	PRIMARY 6 PORT CAVITY COMBINER	\$8,400.00	0%	\$8,400.0
2	GPB 800 REFERENCE DIST MODULE REFERENCE DISTRIBUTION SOFTWARE (INCLUDED W/ GPB 8000)	\$23,000.00 \$0.00	0% 0%	\$46,000.0 \$0.0
2 1	GGM 8000 GATEWAY 7.5' OPEN RACK, 48 RU	\$4,200.00 \$495.00	0% 0%	\$8,400.0 \$495.0
1	GTR 8000 EXPANDABLE SITE SUBSYSTEM	\$6,000.00	0%	\$6,000.0
6 6	700/800 MHZ MID POWER ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$6,300.00 \$4,000.00	0% 0%	\$37,800.0 \$24,000.0
6	GTR 8000 BASE RADIOS IP BASED MULTISITE BASE RADIO SOFTWARE	\$11,900.00 \$16,700.00	0% 0%	\$71,400.0 \$100,200.0
1 1	CABINET RMC W/CAPABILITY OF 6 BRS PRIMARY 6 PORT CAVITY COMBINER	\$700.00 \$8,400.00	0% 0%	\$700.0 \$8,400.0
2	XHUB 7.5' OPEN RACK, 48 RU	\$3,500.00 \$495.00	0% 0%	\$3,500.0 \$495.0
1	GTR 8000 EXPANDABLE SITE SUBSYSTEM	\$6,000.00	0%	\$6,000.0
6 6	700/800 MHZ MID POWER ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$6,300.00 \$4,000.00	0%	\$37,800.0 \$24,000.0
6 6	GTR 8000 BASE RADIOS IP BASED MULTISITE BASE RADIO SOFTWARE	\$11,900.00 \$16,700.00	0%	\$71,400.0 \$100,200.0
1	PRIMARY 6 PORT CAVITY COMBINER	\$2,100.00 \$8,400.00	0%	\$2,100.0 \$8,400.0
2	XHUB	\$3,500.00	0%	\$3,500.0
1	7.5' OPEN RACK, 48 RU	\$495.00	0%	\$495.0
1 6	GTR 8000 EXPANDABLE SITE SUBSYSTEM 700/800 MHZ MID POWER	\$6,000.00 \$6,300.00	0% 0%	\$6,000.0 \$37,800.0
6 6	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE GTR 8000 BASE RADIOS	\$4,000.00 \$11,900.00	0%	\$24,000.0 \$71,400.0
6 1	IP BASED MULTISITE BASE RADIO SOFTWARE CABINET RMC W/CAPABILITY OF 6 BRS	\$16,700.00 \$700.00	0% 0%	\$100,200.0 \$700.0
1	PRIMARY 6 PORT CAVITY COMBINER XHUB	\$8,400.00 \$3,500.00	0% 0%	\$8,400.0 \$3,500.0
1	7.5' OPEN RACK, 48 RU	\$495.00		\$495.0
1 4	GTR 8000 EXPANDABLE SITE SUBSYSTEM 700/800 MHZ MID POWER	\$6,000.00 \$6,300.00	0% 0%	\$6,000.0 \$25,200.0
4	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$4,000.00	0%	\$16,000.0
4	GTR 8000 BASE RADIOS IP BASED MULTISITE BASE RADIO SOFTWARE	\$11,900.00 \$16,700.00	0%	\$47,600.0 \$66,800.0
1 1	CABINET RMC W/CAPABILITY OF 6 BRS PRIMARY 6 PORT CAVITY COMBINER	\$700.00 \$8,400.00	0%	\$700.0 \$8,400.0
2 1	XHUB 7.5' OPEN RACK, 48 RU	\$3,500.00 \$495.00	0% 0%	\$3,500.0 \$495.0
3	800 MHZTX FILTER W/PMU	\$1,000.00	0%	\$3,000.0
3 2	PHASING HARNESS SITE PRESELECTOR	\$1,000.00 \$3,500.00	0% 0%	\$3,000.0 \$7,000.0
5	SURGE ARRESTOR	\$80.23	0%	\$401.1
1 1	SITE MANAGER 90VAC TO 260VAC PS TO SM	\$3,000.00 \$120.00	0% 0%	\$3,000.0 \$120.0
1	SDM300 ASTRO F/W FOR A7.9 TERM BLOCK	\$1,850.00 \$90.00		\$1,850.0 \$270.0
1 15	800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2,000.00 \$2.95	0%	\$2,000.0 \$44.2
2 2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR CABLE WRAP WEATHERPROOFING	\$26.00 \$36.45	0% 0%	\$52.0 \$72.9
200	CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT 1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$20.98 \$176.51	0% 0%	\$4,196.0 \$353.0
5 2	1-5/8" SUREGROUND GROUNDING 1-5/8" SUPPORT HOIST GRIP	\$38.51 \$35.36	0% 0%	\$192.5 \$70.7
7 25	1-5/8" CABLE HANGER KIT 10 PACK CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$28.08 \$2.95	0% 0%	\$196.5 \$73.7
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
1 15	800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2,000.00 \$2.95	0% 0%	\$2,000.0 \$44.2
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR CABLE WRAP WEATHERPROOFING	\$26.00	0%	\$52.0
200	CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT	\$36.45 \$20.98	0%	\$72.9 \$4,196.0
2 5	1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR 1-5/8" SUREGROUND GROUNDING	\$176.51 \$38.51	0% 0%	\$353.0 \$192.5
2 7	1-5/8" SUPPORT HOIST GRIP 1-5/8" CABLE HANGER KIT 10 PACK	\$35.36 \$28.08	0% 0%	\$70.7 \$196.5
25 2	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$2.95 \$26.00	0% 0%	\$73.7 \$52.0
1	800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$2,000.00	0%	\$2,000.0
15 2	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$2.95 \$26.00	0%	\$44.2 \$52.0
2 200	CABLE 1-16 WRAP WEATHERPROOFING CABLE 1-5/8" AVA HELIAX POLY JKT PER FOOT	\$36.45	0%	\$72.9 \$72.9 \$4,196.0
2	1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$176.51	0%	\$353.0
5	1-5/8" SUREGROUND GROUNDING 1-5/8" SUPPORT HOIST GRIP	\$38.51 \$35.36	0%	\$192.5 \$70.7
7 25	1-5/8" CABLE HANGER KIT 10 PACK CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$28.08 \$2.95	0%	\$196.5 \$73.7
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
1 15	800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2,000.00 \$2.95	0% 0%	\$2,000.0 \$44.2
2 2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR CABLE WRAP WEATHERPROOFING	\$26.00 \$36.45	0% 0%	\$52.0 \$72.9
200 2	CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT 1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$20.98 \$176.51	0% 0%	\$4,196.0 \$353.0
5 2	1-5/8" SUREGROUND GROUNDING 1-5/8" SUPPORT HOIST GRIP	\$38.51	0%	\$192.5 \$70.7
7 25	1-5/8" CABLE HANGER KIT 10 PACK CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$28.08	0%	\$196.5 \$73.7
25	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$2.95	0%	\$73.7 \$52.0
1	800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$2,000.00	0%	\$2,000.0
15 2	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$2.95 \$26.00	0%	\$44.2 \$52.0
2 200	CABLE WRAP WEATHERPROOFING CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT	\$36.45 \$20.98	0%	\$72.9 \$4,196.0
2 5	1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR 1-5/8" SUREGROUND GROUNDING	\$176.51 \$38.51	0% 0%	\$353.0 \$192.5
2 7	1-5/8" SUPPORT HOIST GRIP 1-5/8" CABLE HANGER KIT 10 PACK	\$35.36		\$70.7 \$196.5
25 2	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$2.95	0%	\$73.7 \$52.0
1	48 VDC RECTIFIER/DC DISTRIBUTION SYSTEM	\$36,680.00	0%	
1	48 VDC RECTIFIER/DC DISTRIBUTION SYSTEM 48 VDC VRLA BATTERY PLANT	\$45,000.00	0%	\$36,680.0 \$45,000.0
1	48 VDC WIBINC	¢40.000.01		
1 1 1 1	48 VDC WIRING SPILL CONTAINMENT HIGH-SEISMIC RACK	\$12,000.00 \$5,000.00 \$2,000.00	0% 0% 0%	\$12,000.0 \$5,000.0 \$2,000.0

#### URBAN AREA TRUNKED SIMULCAST SITE WITH 800 MHz, VHF & UHF

2 2 2 2	GPS TIMING ANTENA/RECEIVER MOUNTING KIT FOR GPS ANTENNA HPD GPS SURGE PROTECTOR 48 VDC 105 OUTDODE U/V PROTECTED CABLE 6PD 22 AWG DB15	\$1,090.00 \$90.00 \$625.00 \$530.00		\$2,180. \$180. \$1,250. \$1,060
2	125' OUTDOOR UV PROTECTED CABLE 6PR, 22 AWG DB15 GTR 8000 EXPANDABLE SITE SUBSYSTEM 700/800 MHZ MID POWER	\$530.00 \$6,000.00 \$6,300.00	0%	\$1,060. \$6,000. \$37,800.
6 6	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE GTR 8000 BASE RADIOS IP BASED MULTISITE BASE RADIO SOFTWARE	\$4,000.00 \$11,900.00 \$16,700.00	0%	\$24,000. \$71,400. \$100,200.
1 1 2	SITE & CABINET RMC W/CAPABILITY OF 7-24 BRS PRIMARY 6 PORT CAVITY COMBINER GPB 800 REFERENCE DIST MODULE	\$2,100.00 \$8,400.00 \$23,000.00	0%	\$2,100. \$8,400. \$46,000.
2 2	GF DOO REFERENCE DIST MODDLE REFERENCE DISTRIBUTION SOFTWARE (INCLUDED W/ GPB 8000) GGM 8000 GATEWAY 7.5' OPEN RACK, 48 RU	\$0.00 \$4,200.00 \$495.00	0%	\$40,000. \$0.0 \$8,400. \$495.
1 6	GTR 8000 EXPANDABLE SITE SUBSYSTEM 700/800 MHZ MID POWER	\$6,000.00 \$6,300.00	0%	\$6,000. \$37,800.
6 6 6	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE GTR 8000 BASE RADIOS IP BASED MULTISITE BASE RADIO SOFTWARE	\$4,000.00 \$11,900.00 \$16,700.00	0%	\$24,000. \$71,400. \$100,200.
1	CABINET RMC W/CAPABILITY OF 6 BRS PRIMARY 6 PORT CAVITY COMBINER XHUB	\$700.00 \$8,400.00 \$3,500.00	0%	\$700. \$8,400. \$3,500.
1	7.5' OPEN RACK, 48 RU GTR 8000 EXPANDABLE SITE SUBSYSTEM	\$495.00	0%	\$495.
6 6 6	700/800 MHZ MID POWER ASTRO 25 P25 PHASE 2 TDMA SOFTWARE GTR 8000 BASE RADIOS	\$6,300.00 \$6,300.00 \$4,000.00 \$11,900.00	0%	\$37,800 \$24,000 \$71,400
6 1	IP BASED MULTISITE BASE RADIO SOFTWARE SITE & CABINET RMC W/CAPABILITY OF 7-24 BRS	\$16,700.00 \$2,100.00	0%	\$100,200 \$2,100.
2	PRIMARY 6 PORT CAVITY COMBINER XHUB 7.5' OPEN RACK, 48 RU	\$8,400.00 \$3,500.00 \$495.00	0%	\$8,400. \$3,500. \$495.
1 6	GTR 8000 EXPANDABLE SITE SUBSYSTEM 700/800 MHZ MID POWER ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$6,000.00 \$6,300.00 \$4,000.00	0% 0% 0%	\$6,000 \$37,800 \$24,000
6 6 1	GTR 8000 BASE RADIOS IP BASED MULTISITE BASE RADIO SOFTWARE CABINET RMC W/CAPABILITY OF 6 BRS	\$4,000.00 \$11,900.00 \$16,700.00 \$700.00	0%	\$24,000 \$71,400 \$100,200 \$700.
1 2	PRIMARY 6 PORT CAVITY COMBINER XHUB 7.5' OPEN RACK, 48 RU	\$8,400.00 \$3,500.00 \$495.00	0%	\$700. \$8,400. \$3,500. \$495.
1	GTR 8000 EXPANDABLE SITE SUBSYSTEM 700/800 MHZ MID POWER	\$6,000.00	0%	\$6,000.
4 4 4	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE GTR 8000 BASE RADIOS	\$6,300.00 \$4,000.00 \$11,900.00	0% 0% 0%	\$25,200 \$16,000 \$47,600
4	IP BASED MULTISITE BASE RADIO SOFTWARE CABINET RMC W/CAPABILITY OF 6 BRS PRIMARY 6 PORT CAVITY COMBINER	\$16,700.00 \$700.00 \$8,400.00	0%	\$66,800 \$700 \$8,400
2	XHUB 7.5' OPEN RACK, 48 RU	\$3,500.00 \$495.00	0%	\$3,500. \$495.
1 2 2	GTR 8000 EXPANDABLE SITE SUBSYSTEM VHF MID POWER ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$6,000.00 \$6,300.00 \$4,000.00	0% 0% 0%	\$6,000. \$12,600. \$8,000.
2	GTR 8000 BASE RADIOS IP BASED MULTISITE BASE RADIO SOFTWARE CABINET RMC W/CAPABILITY OF 6 BRS	\$11,900.00 \$16,700.00 \$700.00	0%	\$23,800 \$33,400 \$700.
1 2 1	PRIMARY 6 PORT CAVITY COMBINER XHUB 7.5' OPEN RACK, 48 RU	\$8,400.00 \$3,500.00 \$495.00	0%	\$8,400. \$3,500. \$495.
1 2	GTR 8000 EXPANDABLE SITE SUBSYSTEM UHF MID POWER	\$6,000.00 \$6,300.00	0%	\$6,000. \$12,600
2 2 2	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE GTR 8000 BASE RADIOS IP BASED MULTISITE BASE RADIO SOFTWARE	\$4,000.00 \$11,900.00 \$16,700.00	0% 0% 0%	\$8,000 \$23,800 \$33,400
1 1 2	CABINET RMC WICAPABILITY OF 6 BRS PRIMARY 6 PORT CAVITY COMBINER XHUB	\$700.00 \$8,400.00 \$3,500.00	0%	\$700 \$8,400 \$3,500
1	7.5' OPEN RACK, 48 RU 800 MHZ TX FILTER W/PMU	\$495.00	0%	\$495.
3 2	PHASING HARNESS 800 MHZ SITE PRESELECTOR UHF TX FILTER W/PMU	\$1,000.00 \$3,500.00	0%	\$3,000. \$3,000. \$7,000. \$3,500.
1	UHF SITE PRESELECTOR VHF TX FILTER W/PMU	\$3,500.00 \$3,500.00 \$3,500.00	0% 0%	\$3,500 \$3,500
9	VHF SITE PRESELECTOR SURGE ARRESTOR	\$3,500.00	0%	\$3,500. \$722.
1 1 1	SITE MANAGER 90VAC TO 260VAC PS TO SM SDM3000 ASTRO F/W FOR A7.9	\$3,000.00 \$120.00 \$1,850.00	0%	\$3,000. \$120. \$1,850.
3	TERM BLOCK 800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$90.00 \$2,000.00	0%	\$270. \$2,000.
15 2 2	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR CABLE WRAP WEATHERPROOFING	\$2.95 \$26.00 \$36.45	0% 0% 0%	\$44. \$52. \$72.
200 2 5	CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT 1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR 1-5/8" SUREGROUND GROUNDING	\$20.98 \$176.51 \$38.51	0% 0% 0%	\$4,196. \$353. \$192.
2 7 25	1-5/8" SUPPORT HOIST GRIP 1-5/8" CABLE HANGER KIT 10 PACK CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$35.36 \$28.08 \$2.95	0% 0% 0%	\$70. \$196. \$73.
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR 800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$26.00 \$2,000.00	0%	\$52.
15 2 2	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR CABLE WRAP WEATHERPROOFING	\$2.95 \$26.00 \$36.45	0% 0% 0%	\$44. \$52. \$72.
200 2 5	CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT 1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR 1-5/8" SUREGROUND GROUNDING	\$20.98 \$176.51 \$38.51	0% 0% 0%	\$4,196. \$353. \$192.
2 7 25	1-5/8' SUPPORT HOIST GRIP 1-5/8' CABLE HANGER KIT 10 PACK CABLE: 1/2' LDF HELIAX POLY JKT PER FOOT	\$35.36 \$28.08 \$2.95	0% 0% 0%	\$70. \$196. \$73.
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR 800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$26.00 \$2,000.00	0%	\$52. \$2,000.
15 2 2	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR CABLE WRAP WEATHERPROOFING	\$2.95 \$26.00 \$36.45	0% 0% 0%	\$44. \$52. \$72.
200 2 5	CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT 1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR 1-5/8" SUREGROUND GROUNDING	\$20.98 \$176.51 \$38.51	0% 0% 0%	\$4,196. \$353. \$192.
2 7 25	1-5/8" SUPPORT HOIST GRIP 1-5/8" CABLE HANGER KIT 10 PACK CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$35.36 \$28.08 \$2.95	0%	\$70. \$196. \$73.
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR 800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$26.00 \$2,000.00	0%	\$52.
15 2 2	CABLE: 1/2* LDF HELIAX POLY JKT PER FOOT 1/2' 7 - 16 DIN MALE POSITIVE STOP CONNECTOR CABLE WRAP WEATHERPROOFING	\$2.95 \$26.00 \$36.45	0% 0% 0%	\$44. \$52. \$72.
200 2 5	CABLE: 1-5/8' AVA HELIAX POLY JKT PER FOOT 1-5/8' 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR 1-5/8' SUREGROUND GROUNDING	\$20.98 \$176.51 \$38.51	0% 0% 0%	\$4,196. \$353. \$192.
2 7 25	1-5/8' SUPPORT HOIST GRIP 1-5/8' CABLE HANGER KIT 10 PACK CABLE: 1/2' LDF HELIAX POLY JKT PER FOOT	\$35.36 \$28.08 \$2.95	0% 0% 0%	\$70. \$196. \$73.
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR     800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$26.00 \$2,000.00		\$52.
15 2	CABLE: 1/2' LDF HELIAX POLY JKT PER FOOT 1/2' 7 - 16 DIN MALE POSITIVE STOP CONNECTOR CABLE WRAP WEATHERPROOFING	\$2.95 \$26.00 \$36.45	0%	\$44. \$52. \$72.
2 200 2 5	CABLE WKAP WEATHERPROOFING CABLE: 1-5/8' AVA HELIAX POLY JKT PER FOOT 1-5/8' 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR 1-5/8' SUREGROUND GROUNDING	\$36.45 \$20.98 \$176.51 \$38.51	0%	\$72. \$4,196. \$353. \$192.
2 7 25	1-5/8* SUREGROUND GROUNDING 1-5/8* SUPPORT HOIST GRIP 1-5/8* CABLE HANGER KIT 10 PACK CABLE: 1/2* LDF HELIAX POLY JKT PER FOOT	\$38.51 \$35.36 \$28.08 \$2.95	0%	\$192. \$70. \$196. \$73.
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.
1 15 2	VHF OMNI ANTENNA, 6 DBD, V-POL CABLE: 1/2* LDF HELIAX POLY JKT PER FOOT 1/2* 7 - 16 DIN MALE POSITIVE STOP CONNECTOR CABLE SWRAD WEATHERDROOFING	\$1,450.00 \$2.95 \$26.00	0% 0%	\$1,450. \$44. \$52.
2 200 2	CABLE WRAP WEATHERPROOFING CABLE: 7/8* AVA HELIAX POLY JKT PER FOOT 7/8* 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$32.21 \$8.37 \$39.31	0% 0% 0%	\$64 \$1,674 \$78
5 2 7	7/8" SUREGROUND GROUNDING 7/8" SUPPORT HOIST GRIP 7/8" CABLE HANGER KIT 10 PACK	\$34.84 \$55.50 \$28.08	0% 0% 0%	\$174. \$111. \$196.
25	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$2.95 \$26.00	0%	\$73. \$52.
1 15 2	VHF OMNI ANTENNA, 6 DBD, V-POL CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$1,450.00 \$2.95 \$26.00	0%	\$1,450. \$44. \$52.
2 200 2	CABLE WRAP WEATHERPROOFING CABLE: 7/8* AVA HELIAX POLY JKT PER FOOT 7/8* 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$32.21 \$8.37 \$39.31	0% 0% 0%	\$64. \$1,674. \$78.
5 2 7	7/8' SUREGROUND GROUNDING 7/8' SUPPORT HOIST GRIP 7/8' CABLE HANGER KIT 10 PACK	\$34.84 \$55.50 \$28.08	0% 0% 0%	\$174. \$111. \$196.
25 2	CABLE: 1/2* LDF HELIAX POLY JKT PER FOOT 1/2* 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$2.95 \$26.00	0% 0%	\$73. \$52.
1 15 2	UHF OMNI ANTENNA, 6 DBD, V-POL CABLE: 1/2° LDF HELIAX POLY JKT PER FOOT 1/2° 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$1,154.00 \$2.95 \$26.00	0% 0% 0%	\$1,154. \$44. \$52.
2 200 2	CABLE WRAP WEATHERPROOFING CABLE: 7/8° AVA HELIAX POLY JKT PER FOOT 7/8° 7 - 18 DIN FEMALE POSTIVE STOP CONNECTOR	\$32.21 \$8.37 \$39.31	0% 0% 0%	\$64. \$1,674. \$78.
5 2 7	7/8" SUREGROUND GROUNDING 7/8" SUREGROUND GROUNDING 7/8" SUPPORT HOIST GRIP 7/8" CABLE HANGER KIT 10 PACK	\$39.31 \$34.84 \$55.50 \$28.08	0% 0%	\$174. \$174. \$111. \$196.
25 2	7/8 CABLE HANGER KIT 10 PACK CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$28.08 \$2.95 \$26.00	0%	\$196. \$73. \$52.
1 15 2	UHF OMNI ANTENNA, 6 DBD, V-POL CABLE: 1/2* LDF HELIAX POLY JKT PER FOOT 1/2* 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$1,154.00 \$2.95 \$26.00	0% 0% 0%	\$1,154. \$44. \$52
2 2 2 2 2 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2	CABLE WRAP WEATHERPROOFING CABLE: 7/8* AVA HELIAX POLY JKT PER FOOT	\$32.21 \$8.37	0% 0%	\$64. \$1,674
2 5 2	7/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR 7/8" SUREGROUND GROUNDING 7/8" SUPPORT HOIST GRIP 7/8" CANE LUNICE T 40 DAGK	\$39.31 \$34.84 \$55.50		\$78. \$174. \$111.
7 25 2	7/8" CABLE HANGER KIT 10 PACK CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT 1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$28.08 \$2.95 \$26.00	0% 0% 0%	\$196. \$73. \$52.
1	48 VDC RECTIFIER/DC DISTRIBUTION SYSTEM 48 VDC VRLA BATTERY PLANT	\$36,680.00 \$45,000.00	0%	\$36,680 \$45,000
1	48 VDC WIRING	\$12,000.00	0%	\$12,000

#### 800 MHz SIMULCAST TRUNKED SITE - TRANSPORTATION CORRIDORS

QUANTITY	TRUNKING SIMULCAST	UNIT PRICE	DISCOUNT	KC PRICE
2	GPS TIMING ANTENA/RECEIVER	\$1,090.00		\$2,180.00
2	MOUNTING KIT FOR GPS ANTENNA	\$90.00		\$180.00
2	HPD GPS SURGE PROTECTOR 48 VDC	\$625.00		\$1,250.00
2	125' OUTDOOR UV PROTECTED CABLE 6PR, 22 AWG DB15	\$530.00		\$1,060.00
		<b></b>		+ ,
1	GTR 8000 EXPANDABLE SITE SUBSYSTEM	\$6,000.00	0%	\$6,000.00
6	700/800 MHZ MID POWER	\$6,300.00		
6	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$4,000.00		
6	GTR 8000 BASE RADIOS	\$11,900.00		
6	IP BASED MULTISITE BASE RADIO SOFTWARE	\$16,700.00		\$100,200.00
1	SITE & CABINET RMC W/CAPABILITY OF 7-24 BRS	\$2,100.00		\$2,100.00
1	PRIMARY 6 PORT CAVITY COMBINER	\$8,400.00	0%	\$8,400.00
2	GPB 800 REFERENCE DIST MODULE	\$23,000.00	0%	\$46,000.00
2	REFERENCE DISTRIBUTION SOFTWARE (INCLUDED W/ GPB 8000)	\$0.00	0%	\$0.00
2	GGM 8000 GATEWAY	\$4,200.00	0%	\$8,400.00
1	7.5' OPEN RACK, 48 RU	\$495.00	0%	\$495.00
1	GTR 8000 EXPANDABLE SITE SUBSYSTEM	\$6,000.00	0%	\$6,000.00
2	700/800 MHZ MID POWER	\$6,300.00	0%	\$12,600.00
2	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$4,000.00	0%	\$8,000.00
2	GTR 8000 BASE RADIOS	\$11,900.00	0%	\$23,800.00
2	IP BASED MULTISITE BASE RADIO SOFTWARE	\$16,700.00	0%	\$33,400.00
1	CABINET RMC W/CAPABILITY OF 6 BRS	\$700.00	0%	\$700.00
1	PRIMARY 6 PORT CAVITY COMBINER	\$8,400.00	0%	\$8,400.00
2	XHUB	\$3,500.00	0%	\$3,500.00
1	7.5' OPEN RACK, 48 RU	\$495.00	0%	\$495.00
1	800 MHZ TX FILTER W/PMU	\$1,000.00	0%	\$1,000.00
1	PHASING HARNESS	\$1,000.00	0%	\$1,000.00
1	800 MHZ SITE PRESELECTOR	\$3,500.00	0%	\$3,500.00
2	SURGE ARRESTOR	\$80.23	0%	\$160.46
1	SITE MANAGER	\$3,000.00		\$3,000.00
1	90VAC TO 260VAC PS TO SM	\$120.00	0%	\$120.00
1	SDM3000 ASTRO F/W FOR A7.9	\$1,850.00		\$1,850.00
3	TERM BLOCK	\$90.00	0%	\$270.00
1	800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$2,000.00		\$2,000.00
15	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95		\$44.25
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00		\$52.00
2	CABLE WRAP WEATHERPROOFING	\$36.45		\$72.90
200	CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT	\$20.98		\$4,196.00
2	1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$176.51		\$353.02
5	1-5/8" SUREGROUND GROUNDING	\$38.51	0%	\$192.55
2	1-5/8" SUPPORT HOIST GRIP	\$35.36		\$70.72
7	1-5/8" CABLE HANGER KIT 10 PACK	\$28.08		\$196.56
25	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95		\$73.75
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.00
		<b>#0.000.0</b>		<b>#0.000</b>
1	800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$2,000.00		\$2,000.00
15		\$2.95		\$44.25
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.00
2		\$36.45		\$72.90
200		\$20.98		\$4,196.00
2		\$176.51	0%	\$353.02
5		\$38.51	0%	\$192.55
<u>          2</u> 7	1-5/8" SUPPORT HOIST GRIP 1-5/8" CABLE HANGER KIT 10 PACK	\$35.36 \$28.08		\$70.72 \$196.56
	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT			\$196.56
25 2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$2.95 \$26.00	0% 0%	
		j 	0%	\$52.00
1		¢26 600 00	00/	¢26 600 00
1	48 VDC RECTIFIER/DC DISTRIBUTION SYSTEM	\$36,680.00		\$36,680.00
1	48 VDC VRLA BATTERY PLANT 48 VDC WIRING	\$45,000.00		\$45,000.00
1	SPILL CONTAINMENT	\$12,000.00		. ,
1	HIGH-SEISMIC RACK	\$5,000.00		\$5,000.00 \$2,000.00
1		\$2,000.00	0%	φ∠,000.0U
		+	Total	\$532,547.96
		1		ψυυ∠,υ+1.30

800 MHz/VHF/UHF TRUNKED SIMULCAST SITE - TRANSPORTATIO CORRIDORS

2 2 2	Y TRUNKING SIMULCAST GPS TIMING ANTENA/RECEIVER MOUNTING KIT FOR GPS ANTENNA	UNIT PRICE \$1,090.00 \$90.00	DISCOUNT 0% 0%	<u>\$2,180.0</u> \$180.0
2 2	HPD GPS SURGE PROTECTOR 48 VDC 125' OUTDOOR UV PROTECTED CABLE 6PR, 22 AWG DB15	\$90.00 \$625.00 \$530.00	0% 0%	\$1,250.0 \$1,060.0
1	GTR 8000 EXPANDABLE SITE SUBSYSTEM	\$6,000.00	0%	\$6,000.0
6	700/800 MHZ MID POWER	\$6,300.00	0%	\$37,800.0
6	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$4,000.00	0%	\$24,000.0
6	GTR 8000 BASE RADIOS	\$11,900.00	0%	\$71,400.0
6	IP BASED MULTISITE BASE RADIO SOFTWARE	\$16,700.00	0%	\$100,200.0
1	SITE & CABINET RMC W/CAPABILITY OF 7-24 BRS	\$2,100.00	0%	\$2,100.0
1	PRIMARY 6 PORT CAVITY COMBINER	\$8,400.00	0%	\$8,400.0
2	GPB 800 REFERENCE DIST MODULE	\$23,000.00	0%	\$46,000.0
2	REFERENCE DISTRIBUTION SOFTWARE (INCLUDED W/ GPB 8000)	\$0.00	0%	\$0.0
2	GGM 8000 GATEWAY	\$4,200.00	0%	\$8,400.0
1	7.5' OPEN RACK, 48 RU GTR 8000 EXPANDABLE SITE SUBSYSTEM	\$495.00	0% 0%	\$495.0
2	700/800 MHZ MID POWER	\$6,300.00	0%	\$12,600.0
2	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$4,000.00	0%	\$8,000.0
2	GTR 8000 BASE RADIOS	\$11,900.00	0%	\$23,800.0
2	IP BASED MULTISITE BASE RADIO SOFTWARE	\$16,700.00	0%	\$33,400.0
1	CABINET RMC W/CAPABILITY OF 6 BRS	\$700.00	0%	\$700.0
1	PRIMARY 6 PORT CAVITY COMBINER	\$8,400.00	0%	\$8,400.0
1 2 1	FRIMARY & FORT CAVITY COMBINER           XHUB           7.5' OPEN RACK, 48 RU	\$3,500.00 \$495.00	0% 0%	\$3,500.0 \$495.0
1	GTR 8000 EXPANDABLE SITE SUBSYSTEM	\$6,000.00	0%	\$6,000.0
2	VHF MID POWER	\$6,300.00	0%	\$12,600.0
2	ASTRO 25 PES PHASE 2 TDMA SOFTWARE	\$4,000.00	0%	\$8,000.0
2	GTR 8000 BASE RADIOS	\$11,900.00	0%	\$23,800.0
2	IP BASED MULTISITE BASE RADIO SOFTWARE	\$16,700.00	0%	\$33,400.0
1	CABINET RMC W/CAPABILITY OF 6 BRS	\$700.00	0%	\$700.0
1	PRIMARY 6 PORT CAVITY COMBINER	\$8,400.00	0%	\$8,400.0
2	XHUB	\$3,500.00	0%	\$3,500.0
1	7.5' OPEN RACK, 48 RU	\$495.00	0%	\$495.0
1	GTR 8000 EXPANDABLE SITE SUBSYSTEM	\$6,000.00	0%	\$6,000.0
2	UHF MID POWER	\$6,300.00	0%	\$12,600.0
2	ASTRO 25 P25 PHASE 2 TDMA SOFTWARE	\$4,000.00	0%	\$8,000.0
2	GTR 8000 BASE RADIOS	\$11,900.00	0%	\$23,800.0
2	IP BASED MULTISITE BASE RADIO SOFTWARE	\$16,700.00	0%	\$33,400.0
1	CABINET RMC W/CAPABILITY OF 6 BRS	\$700.00	0%	\$700.0
1 2 1	PRIMARY 6 PORT CAVITY COMBINER XHUB 7.5' OPEN RACK, 48 RU	\$700.00 \$8,400.00 \$3,500.00 \$495.00	0% 0% 0%	\$700.0 \$8,400.0 \$3,500.0 \$495.0
1	800 MHZ TX FILTER W/PMU	\$1,000.00	0%	\$1,000.0
1	PHASING HARNESS	\$1,000.00	0%	\$1,000.0
1	800 MHZ SITE PRESELECTOR	\$3,500.00	0%	\$3,500.0
1	UHF TX FILTER W/PMU	\$3,500.00	0%	\$3,500.0
1	UHF SITE PRESELECTOR	\$3,500.00	0%	\$3,500.0
1	VHF TX FILTER W/PMU	\$3,500.00	0%	\$3,500.0
1	VHF SITE PRESELECTOR	\$3,500.00	0%	\$3,500.0
6	SURGE ARRESTOR SITE MANAGER	\$80.23	0%	\$481.3
1	90VAC TO 260VAC PS TO SM	\$120.00	0%	\$120.0
1	SDM3000 ASTRO F/W FOR A7.9	\$1,850.00	0%	\$1,850.0
3	TERM BLOCK 800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$90.00	0% 0%	\$270.0 \$2,000.0
15	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$44.2
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
2	CABLE WRAP WEATHERPROOFING	\$36.45	0%	\$72.9
200	CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT	\$20.98	0%	\$4,196.0
2	1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$176.51	0%	\$353.0
5	1-5/8" SUREGROUND GROUNDING	\$38.51	0%	\$192.5
2	1-5/8" SUPPORT HOIST GRIP	\$35.36	0%	\$70.7
7	1-5/8" CABLE HANGER KIT 10 PACK	\$28.08	0%	\$196.5
25	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$73.
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
1	800 MHZ COLLINEAR OMNI ANTENNA, 11.5 DBD	\$2,000.00	0%	\$2,000.0
15	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$44.2
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
2	CABLE WRAP WEATHERPROOFING	\$36.45	0%	\$72.9
200	CABLE: 1-5/8" AVA HELIAX POLY JKT PER FOOT	\$20.98	0%	\$4,196.0
2	1-5/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$176.51	0%	\$353.0
5	1-5/8" SUREGROUND GROUNDING	\$38.51	0%	\$192.5
2	1-5/8" SUPPORT HOIST GRIP	\$35.36	0%	\$70.7
7	1-5/8" CABLE HANGER KIT 10 PACK	\$28.08	0%	\$196.5
25	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$73.5
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
1	VHF OMNI ANTENNA, 6 DBD, V-POL	\$1,450.00	0%	\$1,450.0
15	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$44.2
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
2	CABLE WRAP WEATHERPROOFING	\$32.21	0%	\$64.4
200	CABLE: 7/8" AVA HELIAX POLY JKT PER FOOT	\$8.37	0%	\$1,674.0
2	7/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$39.31	0%	\$78.0
5	7/8" SUREGROUND GROUNDING	\$34.84	0%	\$174.2
2	7/8" SUPPORT HOIST GRIP	\$55.50	0%	\$111.0
7	7/8" CABLE HANGER KIT 10 PACK	\$28.08	0%	\$196.9
25	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$73.7
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
	VHF OMNI ANTENNA, 6 DBD, V-POL	\$1,450.00	0%	\$1,450.0
15	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$44.2
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
2	CABLE WRAP WEATHERPROOFING	\$32.21	0%	\$64.4
200	CABLE: 7/8" AVA HELIAX POLY JKT PER FOOT	\$8.37	0%	\$1,674.0
2	7/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$39.31	0%	\$78.0
5	7/8" SUREGROUND GROUNDING	\$34.84	0%	\$174.:
2	7/8" SUPPORT HOIST GRIP	\$55.50	0%	\$111.0
7	7/8" CABLE HANGER KIT 10 PACK	\$28.08	0%	\$196.9
25	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$73.
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
1	UHF OMNI ANTENNA, 6 DBD, V-POL	\$1,154.00	0%	\$1,154.0
15	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$44.2
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
2	CABLE WRAP WEATHERPROOFING	\$32.21	0%	\$64.4
200	CABLE: 7/8" AVA HELIAX POLY JKT PER FOOT	\$8.37	0%	\$1,674.0
2	7/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$39.31	0%	\$78.6
5	7/8" SUREGROUND GROUNDING	\$34.84	0%	\$174.2
2	7/8" SUPPORT HOIST GRIP	\$55.50	0%	\$111.0
7	7/8" CABLE HANGER KIT 10 PACK	\$28.08	0%	\$196.5
25	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$73.7
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
1	UHF OMNI ANTENNA, 6 DBD, V-POL	\$1,154.00	0%	\$1,154.0
15	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$44.2
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
2	CABLE WRAP WEATHERPROOFING	\$32.21	0%	\$64.4
200	CABLE: 7/8" AVA HELIAX POLY JKT PER FOOT	\$8.37	0%	\$1,674.0
2	7/8" 7 - 16 DIN FEMALE POSTIVE STOP CONNECTOR	\$39.31	0%	\$78.0
5	7/8" SUREGROUND GROUNDING	\$34.84	0%	\$174.2
2	7/8" SUPPORT HOIST GRIP	\$55.50	0%	\$111.0
7	7/8" CABLE HANGER KIT 10 PACK	\$28.08	0%	\$196.5
25	CABLE: 1/2" LDF HELIAX POLY JKT PER FOOT	\$2.95	0%	\$73.7
2	1/2" 7 - 16 DIN MALE POSITIVE STOP CONNECTOR	\$26.00	0%	\$52.0
1 1	48 VDC RECTIFIER/DC DISTRIBUTION SYSTEM 48 VDC VRLA BATTERY PLANT 48 VDC WIRING	\$36,680.00 \$45,000.00 \$12,000.00	0% 0%	\$36,680.0 \$45,000.0 \$12,000.0
1	SPILL CONTAINMENT	\$5,000.00	0%	\$5,000.0
1	HIGH-SEISMIC RACK	\$2,000.00	0%	\$2,000.0

Sheet 4 -King County P25 Radio System Dispatch System Cost Estimate

### KING COUNTY P25 PHASE 2 800 MHz RADIO SYSTEM - DISPATCH SYSTEM COST ESTIMATE

SYSI	EM: KING COUNTY P25 PHASE 2 800 MHz	RADIO SYS	TEM							PREPARED BY: CHECKED BY:					Date: Date:	<u>06-Jan-12</u>	
										CHECKED BI.		<u>CI3</u>	Average Labor			/Hr.	
					1				Material		Labor			Subcontract			111.
ltem	Description	Port	Seattle Sub- Region	King County Sub-Region		EPSCA Sub- Region	Qty	Unit		Extended Amount		Unit Cost	Extended Amount	Unit Cost Exten		Unit Cost	Extended Total
1	Dispatch Workstation Application License, AES, soft instant recall recorder (IRR)	23	34	29	21	22	129	h	\$39,100.00	\$5,043,900.00		\$0.0	\$0.00		\$0.00	\$39,100.00	\$5,043,900.0
1	Dispatch Workstation (1 position), CPU, voice interface module, 19" LCD non-touch screen; Keyboard and	23	34	29	21	22	129	each	\$39,100.00	\$5,043,900.00		\$0.0	50.00		\$0.00	\$39,100.00	\$5,043,900.0
2	mouse, dual speakers, footswitch	23	34	29	21	22	129	each	\$8,927.00	\$1,151,583.00		\$0.0	\$0.00		\$0.00	\$8,927.00	\$1,151,583.0
3	Conventional Channel Interface (CCI; 4 Ch. 4WE&M / V.24)	1	5	7	2	5	20	each	\$4,960.00	\$99,200.00		\$0.0	\$0.00		\$0.00	\$4,960.00	\$99,200.0
4	Auxiliary Input/Output Device, IP (alarm/door controls); application software license, basic	2	5	7	2	5	21	each	\$2,240.00	\$47,040.00		\$0.0	\$0.00		\$0.00	\$2,240.00	\$47,040.0
5	Control Station, Backup, 700/800 MHz, P25 PII TDMA, rack mount 20W; desktop control w/microphone	28	44	36	26	28	162	each	\$8,453.00	\$1,369,386.00		\$0.0	) \$0.00		\$0.00	\$8,453.00	\$1,369,386.00
0	Control Station Antenna System, 746-869 MHz omni, 0 dBd with transmission line, connectors, hoist and	-			-	10	10		<b>#</b> 4 000 00	<b>*</b> 04,000,00		<b>*</b> 0.0	<b>*</b> 0.00		¢0.00	¢4,000,00	<b>#04.000.0</b>
6	ground kit Control station combiner, 746-960 MHz, eight port; single 800 MHz window filter (requires two antennas	5	14	14	5	10	48	each	\$1,902.00	\$91,296.00		\$0.0	) \$0.00		\$0.00	\$1,902.00	\$91,296.00
7	above)	4	5	7	4	5	25	each	\$10,648.48	\$266,212.00		\$0.0	\$0.00		\$0.00	\$10,648.48	\$266,212.00
8	Receiver multicoupler, 16-port; 120 VAC, single receive filter (800 MHz); requires one antenna above.	1	0	0	1	0	2	each	\$4,639.14	\$9,278.28		\$0.0			\$0.00	\$4,639.14	\$9,278.26
9	Ethernet Switch, Managed, 24-Port, Rack Mount Router, Ethernet/T1 Interface, multi-protocol; AES; 4	2	10	14	2	6	34	each	\$2,250.00	\$76,500.00		\$0.0	\$0.00		\$0.00	\$2,250.00	\$76,500.0
10	port	2	10	14	2	6	34	each	\$19,993.00	\$679,762.00		\$0.0			\$0.00	\$19,993.00	\$679,762.0
11	TVSS, 120 VAC, Rack-Mount eight-circuit	2	10	14	2	5	33	each	\$1,091.00	\$36,003.00		\$0.0			\$0.00	\$1,091.00	\$36,003.0
12 13	Misc. site hardware, cables Conventional Site Controller	2	10 5	14 7	2	5 4	33 18	lot	\$1,500.00 \$12,084.00	\$49,500.00		\$0.0			\$0.00 \$0.00	\$1,500.00 \$12,084.00	\$49,500.0
13	Ethernet TVSS, eight-wire, rack mounted	2	5 10	14	2	4 6	34	each each	\$12,084.00	\$217,512.00 \$8,228.00		\$0.0 \$0.0			\$0.00	\$12,084.00 \$242.00	\$217,512.0 \$8,228.0
15	Misc. Spare Equipment (per site)	4	5	7	4	5	25	lot	\$3,000.00	\$75,000.00		\$0.0			\$0.00	\$3,000.00	\$75,000.0
16	Dispatch Logging Application License, AES (per site)	1	5	7	3	4	20	each	\$34,580.00	\$691,600.00		\$0.0	\$0.00		\$0.00	\$34,580.00	\$691,600.0
17	Console logger interface for AES voice encryption, rack- mount	1	5	7	3	4	20	each	\$2,785.00	\$55,700.00		\$0.0			\$0.00	\$2,785.00	\$55,700.0
18	Not Used	0	0	0	0	0	0	each		\$0.00		\$0.0			\$0.00	\$0.00	\$0.0
19	Not Used Logging recorder, Digital IP, 30 calls, rack mount (no	0	0	0	0	0	0	each		\$0.00		\$0.0	\$0.00		\$0.00	\$0.00	\$0.0
20	playback station) Logging recorder interface to Master Site (for trunked	0	5	7	0	3	15	each	\$80,073.00	\$1,201,095.00		\$0.0	\$0.00		\$0.00	\$80,073.00	\$1,201,095.0
21	radio traffic)	0	0	0	0	0	0	each	\$26,886.40	\$0.00		\$0.0	\$0.00		\$0.00	\$26,886.40	\$0.0
22	Digital IP Logging Recorder, 120 channel (max), rack mount; incl. remote replay application and playback station (Qty. 1)	1	0	0	1	1	3	each	\$104,822.80	\$314,468.40		\$0.0	\$0.00		\$0.00	\$104,822.80	\$314,468.4
	Playback Workstation, CPU, 19" LCD non-touch monitor, windows, playback application, mouse,									. ,							
	keyboard KVM switch, eight-port, PS2/USB/VGA	2	5	7	2	4	20	each	\$5,261.00	\$105,220.00	<b> </b>	\$0.0			\$0.00	\$5,261.00	\$105,220.0
24 25	NVIVI SWILCH, EIGHT-POH, FSZ/USB/VGA	2	5	7	2	5 0	21 0	each each	\$726.00	\$15,246.00 \$0.00	+	\$0.0 \$0.0			\$0.00 \$0.00	\$726.00 \$0.00	\$15,246.0 \$0.0
25 26		0	0	0	0	0	0	each		\$0.00		\$0.0			\$0.00	\$0.00 \$0.00	\$0.0
20		0	0	0	0	0	0	each		\$0.00		\$0.0	-		\$0.00	\$0.00	\$0.0
_,		5		, v			~	Cuon		\$11,603,729.68		<i>\$</i> 0.0				MENT TOTAL	\$11,603,729.6
					•											STALLATION	\$348,111.8
-																	\$11,951,841.5

DISPATCH SYSTEMS TOTAL \$11,951,850.00

#### King County P25 Phase 2 Radio System Cost Estimate KING COUNTY P25 PHASE 2 800 MHz RADIO SYSTEM - DISPATCH SYSTEM COST ESTIMATE SYSTEM: PORT OF SEATTLE

#### PREPARED BY: Greg Forrest CHECKED BY: Tom Eckels

											Ma	ater	ial		Labor		Sub
Item	Description	Center 1	Center 2	Center 3	Center 4	Center 5	Center 6	Center 7	Center Qty	Unit	Unit Cost		Extended Amount	Unit MH	Unit Cost	Extended Amount	Unit Cost
1	Dispatch Workstation Application License, AES, soft instant recall recorder (IRR)	23							23	each	\$ 39,100.00	\$	899,300.00	0.000	0.00	0.00	0.00
<u> </u>	Dispatch Workstation (1 position), CPU, voice interface	20							20	cacin	φ 00,100.00	Ψ	000,000.00	0.000	0.00	0.00	0.00
	module, 19" LCD non-touch screen; Keyboard and																
2	mouse, dual speakers, footswitch	23							23	each	\$ 8,927.00	\$	205,321.00	0.000	0.00	0.00	0.00
3	Conventional Channel Interface (CCI; 4 Ch. 4WE&M / V.24)	1							1	each	\$ 4,960.00	\$	4,960.00	0.000	0.00	0.00	0.00
	Auxiliary Input/Output Device, IP (alarm/door controls);																
4	application software license, basic	2							2	each	\$ 2,240.00	\$	4,480.00	0.000	0.00	0.00	0.00
-	Control Station, Backup, 700/800 MHz, P25 PII TDMA,	20							20	h	¢ 0.450.00	¢	000 004 00	0.000	0.00	0.00	0.00
5	rack mount 20W; desktop control w/microphone Control Station Antenna System, 746-869 MHz omni, 0	28						-	28	each	\$ 8,453.00	\$	236,684.00	0.000	0.00	0.00	0.00
6	dBd with transmission line, connectors, hoist and ground kit	5							5	each	\$ 1,902.00	\$	9,510.00	0.000	0.00	0.00	0.00
	Control station combiner, 746-960 MHz, eight port;	5							5	each	ψ 1,302.00	Ψ	3,310.00	0.000	0.00	0.00	0.00
	single 800 MHz window filter (requires two antennas																
7	above)	4							4	each	\$ 10,648.48	\$	42,593.92	0.000	0.00	0.00	0.00
	Receiver multicoupler, 16-port; 120 VAC, single receive																
	filter (800 MHz); requires one antenna above.	1							1		\$ 4,639.14		4,639.14		0.00	0.00	0.00
9	Ethernet Switch, Managed, 24-Port, Rack Mount	2							2	each	\$ 2,250.00	\$	4,500.00	0.000	0.00	0.00	0.00
	Router, Ethernet/T1 Interface, multi-protocol; AES; 4 por	2							2	each	\$ 19,993.00	\$	39,986.00	0.000	0.00	0.00	0.00
	TVSS, 120 VAC, Rack-Mount eight-circuit	2							2	each	\$ 1,091.00	\$	2,182.00	0.000	0.00	0.00	0.00
	Misc. site hardware, cables	2							2	lot	\$ 1,500.00	\$	3,000.00	0.000	0.00	0.00	0.00
	Conventional Site Controller	1							1	each	\$ 12,084.00		12,084.00	0.000	0.00	0.00	0.00
14	Ethernet TVSS, eight-wire, rack mounted	2							2	each	\$ 242.00	\$	484.00	0.000	0.00	0.00	0.00
15	Misc. Spare Equipment (per site)	4							4	lot	\$ 3,000.00	\$	12,000.00	0.000	0.00	0.00	0.00
16	Dispatch Logging Application License, AES (per site)	1							1	each	\$ 34,580.00	\$	34,580.00	0.000	0.00	0.00	0.00
17	Console logger interface for AES voice encryption, rack- mount	1							1	each	\$ 2,785.00	\$	2,785.00	0.000	0.00	0.00	0.00
	Not Used	1							0	each	\$ 2,705.00	φ \$	2,785.00	0.000	0.00	0.00	0.00
	Not Used								0	each	\$ -	\$ \$		0.000	0.00	0.00	0.00
-	Logging recorder, Digital IP, 30 calls, rack mount (no playback station)								0	each	\$ 80,073.00	\$		0.000	0.00	0.00	0.00
	Logging recorder interface to Master Site (for trunked radio traffic)								0	each	\$ 26,886.40	\$		0.000	0.00	0.00	0.00
	Digital IP Logging Recorder, 120 channel (max), rack mount; incl. remote replay application and playback																
22	station (Qty. 1) Playback Workstation, CPU, 19" LCD non-touch	1							1	each	\$104,822.80	\$	104,822.80	0.000	0.00	0.00	0.00
22	monitor, windows, playback application, mouse,	2							2	aaab	¢ 5 261 00	¢	10 522 00	0.000	0.00	0.00	0.00
	keyboard KVM switch, eight-port, PS2/USB/VGA	2							2		\$ 5,261.00 \$ 726.00	\$ \$	10,522.00	0.000	0.00	0.00	0.00
24 25	, and the second s	۷							0	each each		\$ \$	1,452.00	0.000	0.00	0.00	0.00
25 26				}	<u> </u>			ł	0			\$ \$	-	-			
26				}	<u> </u>			ł	U	each	\$- \$-	\$ \$	-	0.000	0.00	0.00	0.00
	Total									each	φ -	Ŧ	- 1,635,885.86		0.00	0.00	0.00

Date:	
Date:	

28-Dec-11

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				Ye	ar 2011\$
Subc	ontract				
Cost	Extended Amount		Unit Cost		Extended Total
.00	0.00	\$	39,100.00	\$	899,300.00
.00	0.00	\$	8,927.00	\$	205,321.00
.00	0.00	\$	4,960.00	\$	4,960.00
.00	0.00	\$	2,240.00	\$	4,480.00
.00	0.00	\$	8,453.00	\$	236,684.00
.00	0.00	\$	1,902.00	\$	9,510.00
.00	0.00	\$	10,648.48	\$	42,593.92
.00	0.00	\$ \$	4,639.14	\$ \$	4,639.14
.00	0.00	¢ \$	19,993.00	\$	39,986.00
.00	0.00	\$	1,091.00	\$	2,182.00
.00	0.00	\$	1,500.00	\$	3,000.00
.00	0.00	\$	12,084.00	\$	12,084.00
.00	0.00	\$	242.00	\$	484.00
.00	0.00	\$	3,000.00	\$	12,000.00
.00	0.00	\$	34,580.00	\$	34,580.00
.00	0.00	\$	2,785.00	\$	2,785.00
.00	0.00	\$	_,	\$	-
.00	0.00	\$	-	\$	-
.00	0.00	\$	80,073.00	\$	-
.00	0.00	\$	26,886.40	\$	-
.00	0.00	\$	104,822.80	\$	104,822.80
.00	0.00	\$	5,261.00	\$	10,522.00
.00	0.00	\$	726.00	\$	1,452.00
.00	0.00	\$	-	\$	-
.00	0.00	\$	-	\$	-
.00	0.00	\$	-	\$	-
	0.00			\$	1,635,885.86

Year 2011\$

# King County P25 Phase 2 Radio System Cost Estimate KING COUNTY P25 PHASE 2 800 MHz RADIO SYSTEM - DISPATCH SYSTEM COST ESTIMATE SYSTEM: <u>Seattle Sub-Region</u>

### PREPARED BY: Greg Forrest CHECKED BY: Tom Eckels

														Average L	abor Rate =	\$0.00	/Hr.		Year 2011\$
											Ma	aterial		Labor		Sub	ocontract		
ltem	Description	Center 1	Center 2	Center 3	Center 4	Center 5	Center 6	Center 7	Center Qty	Unit	Unit Cost	Extended Amount	Unit MH	Unit Cost	Extended Amount	Unit Cost	Extended Amount	Unit Cost	Extended Total
1	Dispatch Workstation Application License, AES, soft instant recall recorder (IRR)	7	7	7	7	6			34	each	\$ 39,100.00	\$ 1,329,400.00	0.000	0.00	0.00	0.00	0.00	\$ 39,100.00	\$ 1,329,400.00
2	Dispatch Workstation (1 position), CPU, voice interface module, 19" LCD non-touch screen; Keyboard and mouse, dual speakers, footswitch	7	7	7	7	6			34	aaab	¢ 0.007.00	¢ 202 519 00	0.000	0.00	0.00	0.00	0.00	¢ 9.007.00	¢ 202 548 0
	Conventional Channel Interface (CCI; 4 Ch. 4WE&M / V.24)	1	1	1	1	1			5	each each	\$ 4,960.00	\$ 303,518.00 \$ 24,800.00	0.000	0.00	0.00	0.00	0.00	\$ 4,960.00	\$ 303,518.00 \$ 24,800.00
4	Auxiliary Input/Output Device, IP (alarm/door controls); application software license, basic	1	1	1	1	1			5	each	\$ 2,240.00		0.000	0.00	0.00	0.00	0.00		
5	Control Station, Backup, 700/800 MHz, P25 PII TDMA, rack mount 20W; desktop control w/microphone	9	9	9	9	8			44	each	\$ 8.453.00	\$ 371,932.00	0.000	0.00	0.00	0.00	0.00	\$ 8,453.00	\$ 371,932.00
6	Control Station Antenna System, 746-869 MHz omni, 0 dBd with transmission line, connectors, hoist and ground kit	3	3	3	3	2			14	each	\$ 1,902.00		0.000	0.00	0.00	0.00	0.00		
	Control station combiner, 746-960 MHz, eight port; single 800 MHz window filter (requires two antennas	5	5	5	5	2													
7	above) Receiver multicoupler, 16-port; 120 VAC, single receive	1	1	1	1	1			5	each	\$ 10,648.48	\$ 53,242.40	0.000	0.00	0.00	0.00	0.00	\$ 10,648.48	\$ 53,242.4
8	filter (800 MHz); requires one antenna above.								0	each	\$ 4,639.14	\$-	0.000	0.00	0.00	0.00	0.00	\$ 4,639.14	\$-
9	Ethernet Switch, Managed, 24-Port, Rack Mount	2	2	2	2	2			10	each	\$ 2,250.00	\$ 22,500.00	0.000	0.00	0.00	0.00	0.00	\$ 2,250.00	\$ 22,500.0
10	Router, Ethernet/T1 Interface, multi-protocol; AES; 4 por	2	2	2	2	2			10	each	\$ 19,993.00	. ,	0.000	0.00	0.00	0.00	0.00	\$ 19,993.00	\$ 199,930.00
11	TVSS, 120 VAC, Rack-Mount eight-circuit	2	2	2	2	2			10	each	\$ 1,091.00	\$ 10,910.00	0.000	0.00	0.00	0.00	0.00	¥ ,	\$ 10,910.0
12	Misc. site hardware, cables	2	2	2	2	2			10	lot	\$ 1,500.00	\$ 15,000.00	0.000	0.00	0.00	0.00	0.00	. ,	\$ 15,000.00
13	Conventional Site Controller	1	1	1	1	1			5	each	\$ 12,084.00	\$ 60,420.00	0.000	0.00	0.00	0.00			\$ 60,420.00
14	Ethernet TVSS, eight-wire, rack mounted	2	2	2	2	2			10	each	\$ 242.00	\$ 2,420.00	0.000	0.00	0.00	0.00	0.00	•	\$ 2,420.0
15	Misc. Spare Equipment (per site)	1	1	1	1	1			5	lot	\$ 3,000.00	\$ 15,000.00	0.000	0.00	0.00	0.00	0.00	\$ 3,000.00	\$ 15,000.0
16	Dispatch Logging Application License, AES (per site) Console logger interface for AES voice encryption, rack-	1	1	1	1	1			5	each	\$ 34,580.00	\$ 172,900.00	0.000	0.00	0.00	0.00	0.00	\$ 34,580.00	\$ 172,900.00
17	mount	1	1	1	1	1			5	each	\$ 2,785.00	\$ 13,925.00	0.000	0.00	0.00	0.00	0.00	\$ 2,785.00	\$ 13,925.0
18	Not Used								0	each	\$-	\$-	0.000	0.00	0.00	0.00	0.00	\$-	\$-
19	Not Used								0	each	\$-	\$-	0.000	0.00	0.00	0.00	0.00	\$-	\$-
20	Logging recorder, Digital IP, 30 calls, rack mount (no playback station)	1	1	1	1	1			5	each	\$ 80,073.00	\$ 400,365.00	0.000	0.00	0.00	0.00	0.00	\$ 80,073.00	\$ 400,365.00
21	Logging recorder interface to Master Site (for trunked radio traffic)								0	each	\$ 26,886.40	\$-	0.000	0.00	0.00	0.00	0.00	\$ 26,886.40	\$-
22	Digital IP Logging Recorder, 120 channel (max), rack mount; incl. remote replay application and playback station (Qty. 1)								0	each	\$104,822.80	\$-	0.000	0.00	0.00	0.00	0.00	\$ 104,822.80	\$-
	Playback Workstation, CPU, 19" LCD non-touch monitor, windows, playback application, mouse, keyboard	1	1	1	1	1			5	each	\$ 5,261.00	\$ 26,305.00	0.000	0.00	0.00	0.00	0.00	\$ 5,261.00	\$ 26,305.0
	KVM switch, eight-port, PS2/USB/VGA	1	1	1	1	1		<u> </u>	5	each	\$ 3,201.00 \$ 726.00		0.000	0.00	0.00	0.00	0.00		
	\$0			*				1	0	each	\$ -	\$ -	0.000	0.00	0.00	0.00	0.00		\$ -
26									0	each	\$ -	\$-	0.000	0.00	0.00	0.00	0.00		\$ -
20									0	each		\$-	0.000	0.00	0.00	0.00	0.00		\$ -
	Total								0	cuon	Ψ -	\$ 3,064,025.40	0.000	0.00	0.00	0.00	0.00		\$ 3,064,025.4

Date:	<u>28-Dec-11</u>
Date:	

#### King County P25 Phase 2 Radio System Cost Estimate KING COUNTY P25 PHASE 2 800 MHz RADIO SYSTEM - DISPATCH SYSTEM COST ESTIMATE SYSTEM: King County Sub-Region

#### PREPARED BY: <u>Greg Forrest</u> CHECKED BY: <u>Tom Eckels</u>

													Average I	_abor Rate =	\$0.00	/Hr.			Year 2011\$
											Mat	terial		Labor		Sub	ocontract		
Item	Description	Center 1 C	enter 2	Center 3	Center 4	Center 5	Center 6	Center 7	Center Qty	Unit	Unit Cost	Extended Amount	Unit Mł	Unit Cost	Extended Amount	Unit Cost	Extended Amount	Unit Cost	Extended Total
	Dispatch Workstation Application License, AES, soft	_		4				4			<b>•</b> • • • • • • • • • • • • • • • • • •	¢ 1 100 000		0.00	0.00	0.00	0.00	<b>•</b> 00,400,00	<b>*</b> 4 400 000 00
	instant recall recorder (IRR) Dispatch Workstation (1 position), CPU, voice interface	5	4	4	4	4	4	4	29	each	\$ 39,100.00	\$ 1,133,900	0.000 00	0.00	0.00	0.00	0.00	\$ 39,100.00	\$ 1,133,900.00
	module, 19" LCD non-touch screen; Keyboard and																		
	mouse, dual speakers, footswitch	5	4	4	4	4	4	4	29	each	\$ 8,927.00	\$ 258,883	0.000	0.00	0.00	0.00	0.00	\$ 8,927.00	\$ 258,883.00
	Conventional Channel Interface (CCI; 4 Ch. 4WE&M /					-					• •,•	,						+ 0,0-1100	+
	V.24)	1	1	1	1	1	1	1	7	each	\$ 4,960.00	\$ 34,720	0.000 0.000	0.00	0.00	0.00	0.00	\$ 4,960.00	\$ 34,720.00
	Auxiliary Input/Output Device, IP (alarm/door controls);																		
4	application software license, basic	1	1	1	1	1	1	1	7	each	\$ 2,240.00	\$ 15,680	000.0 00	0.00	0.00	0.00	0.00	\$ 2,240.00	\$ 15,680.00
	Control Station, Backup, 700/800 MHz, P25 PII TDMA,	6	5	5	F	5	5	5	36	aaab	\$ 8,453.00	¢ 204.209	0.000	0.00	0.00	0.00	0.00	¢ 0.452.00	¢ 204 208 00
_	rack mount 20W; desktop control w/microphone Control Station Antenna System, 746-869 MHz omni, 0	0	5	5	5	5	5	5	30	each	\$ 8,453.00	\$ 304,308	0.000	0.00	0.00	0.00	0.00	\$ 8,453.00	\$ 304,308.00
	dBd with transmission line, connectors, hoist and ground																		
	kit	2	2	2	2	2	2	2	14	each	\$ 1,902.00	\$ 26,628	0.000	0.00	0.00	0.00	0.00	\$ 1,902.00	\$ 26,628.00
-	Control station combiner, 746-960 MHz, eight port;	_	_		_	_					• .,•••••							• ,•••	+
	single 800 MHz window filter (requires two antennas																		
7	above)	1	1	1	1	1	1	1	7	each	\$ 10,648.48	\$ 74,539	36 0.000	0.00	0.00	0.00	0.00	\$ 10,648.48	\$ 74,539.36
	Receiver multicoupler, 16-port; 120 VAC, single receive										<b>•</b> • • • • • •	•							
-	filter (800 MHz); requires one antenna above.	-			-				0		\$ 4,639.14	\$	0.000	0.00	0.00	0.00	0.00		
9	Ethernet Switch, Managed, 24-Port, Rack Mount	2	2	2	2	2	2	2	14	each	\$ 2,250.00	\$ 31,500	0.000 00	0.00	0.00	0.00	0.00	\$ 2,250.00	\$ 31,500.00
10	Router, Ethernet/T1 Interface, multi-protocol; AES; 4 port	2	2	2	2	2	2	2	14	aaab	\$ 19,993.00	\$ 279,902	0.000	0.00	0.00	0.00	0.00	\$ 19.993.00	\$ 279.902.00
	TVSS, 120 VAC, Rack-Mount eight-circuit	2	2	2	2	2	2	2	14	each	\$ 19,993.00 \$ 1,091.00	\$ 279,902 \$ 15,274		0.00	0.00	0.00	0.00	* - ,	\$ 279,902.00 \$ 15,274.00
	Misc. site hardware, cables									each		. ,						. ,	. ,
	Conventional Site Controller	2	2	2	2	2	2	2	14 7	lot	\$ 1,500.00	\$ 21,000 \$ 84,588		0.00	0.00	0.00	0.00	<pre>\$ 1,500.00 \$ 12,084.00</pre>	\$ 21,000.00
				-		1		•		each	\$ 12,084.00			0.00	0.00	0.00	0.00	. ,	\$ 84,588.00
	Ethernet TVSS, eight-wire, rack mounted	2	2	2	2	2	2	2	14	each	\$ 242.00	\$ 3,388		0.00	0.00	0.00	0.00	\$ 242.00	\$ 3,388.00
15	Misc. Spare Equipment (per site)	1	1	1	1	1	1	1	7	lot	\$ 3,000.00	\$ 21,000	000.0 00	0.00	0.00	0.00	0.00	\$ 3,000.00	\$ 21,000.00
16	Dispatch Logging Application License, AES (per site)	1	1	1	1	1	1	1	7	each	\$ 34,580.00	\$ 242,060	0.000 0.000	0.00	0.00	0.00	0.00	\$ 34,580.00	\$ 242,060.00
	Console logger interface for AES voice encryption, rack-	1		1				1	1	cuon	φ 04,000.00	φ 242,000	0.000	0.00	0.00	0.00	0.00	φ 04,000.00	φ 242,000.00
	mount	1	1	1	1	1	1	1	7	each	\$ 2,785.00	\$ 19,495	0.000	0.00	0.00	0.00	0.00	\$ 2,785.00	\$ 19,495.00
18	Not Used								0	each	\$ -	\$		0.00	0.00	0.00	0.00	\$ -	\$ -
19	Not Used								0	each	\$-	\$	0.000	0.00	0.00	0.00	0.00	\$ -	\$ -
	Logging recorder, Digital IP, 30 calls, rack mount (no																		
20	playback station)	1	1	1	1	1	1	1	7	each	\$ 80,073.00	\$ 560,511	000.0 00	0.00	0.00	0.00	0.00	\$ 80,073.00	\$ 560,511.00
	Logging recorder interface to Master Site (for trunked																		
	radio traffic)								0	each	\$ 26,886.40	\$	0.000	0.00	0.00	0.00	0.00	\$ 26,886.40	\$-
	Digital IP Logging Recorder, 120 channel (max), rack																		
	mount; incl. remote replay application and playback station (Qty. 1)								0	h	\$ 104,822.80	¢	0.000	0.00	0.00	0.00	0.00	\$ 104,822.80	¢
	Playback Workstation, CPU, 19" LCD non-touch								0	each		\$	0.000	0.00	0.00	0.00	0.00	ə 104,022.00	- Ф
	monitor, windows, playback application, mouse,																		
	keyboard	1	1	1	1	1	1	1	7	each	\$ 5,261.00	\$ 36,827	0.000	0.00	0.00	0.00	0.00	\$ 5,261.00	\$ 36,827.00
_	KVM switch, eight-port, PS2/USB/VGA	1	1	1	1	1	1	1	7	each	\$ 726.00	\$ 5,082		0.00	0.00	0.00	0.00	. ,	. ,
25						1	1	1	0	each	\$ -	\$		0.00	0.00	0.00	0.00		\$ -
26									0	each	\$-	\$		0.00	0.00	0.00	0.00		\$-
27										each	\$-	\$	0.000	0.00	0.00	0.00	0.00		\$-
	Total									Guon	+	\$ 3,169,285		0.00	0.00	0.00	0.00	*	\$ 3,169,285.36

Date:	<u>28-Dec-11</u>
Date:	

### KING COUNTY P25 PHASE 2 800 MHz RADIO SYSTEM - DISPATCH SYSTEM COST ESTIMATE SYSTEM: Valley Com Sub-Region

PREPARED BY: Greg Forrest CHECKED BY: Tom Eckels

												Av	erage La	abor Rate =	\$0.00	/Hr.				Yea	ar 2011\$
										Mat	teria	al		Labor		Sub	ocontract				
ltem	n Description	Center 1	Center 2 Center 3	Center 4	Center 5	Center 6	Center 7	Center Qty	Unit	Unit Cost		Extended Amount	Unit MH	Unit Cost	Extended Amount	Unit Cost	Extended Amount	U	nit Cost	E	Extended Total
	Dispatch Workstation Application License, AES, soft							Í													
1	instant recall recorder (IRR)	21						21	each	\$ 39,100.00	\$	821,100.00	0.000	0.00	0.00	0.00	0.00	\$	39,100.00	\$	821,100.00
	Dispatch Workstation (1 position), CPU, voice interface																				
0	module, 19" LCD non-touch screen; Keyboard and							04	1	<b>*</b> 0.007.00	<b>^</b>	407 407 00	0.000	0.00	0.00	0.00	0.00	<b>^</b>	0.007.00	<b>^</b>	407 407 00
2	mouse, dual speakers, footswitch Conventional Channel Interface (CCI; 4 Ch. 4WE&M /	21						21	each	\$ 8,927.00	\$	187,467.00	0.000	0.00	0.00	0.00	0.00	\$	8,927.00	\$	187,467.00
3	V.24)	2						2	each	\$ 4,960.00	\$	9,920.00	0.000	0.00	0.00	0.00	0.00	\$	4,960.00	\$	9,920.00
	Auxiliary Input/Output Device, IP (alarm/door controls);																				
4	application software license, basic	2						2	each	\$ 2,240.00	\$	4,480.00	0.000	0.00	0.00	0.00	0.00	\$	2,240.00	\$	4,480.00
I	Control Station Dealure 700/000 MULE DOS DU TOMA																				
5	Control Station, Backup, 700/800 MHz, P25 PII TDMA, rack mount 20W; desktop control w/microphone	26						26	each	\$ 8,453.00	¢	210 779 00	0.000	0.00	0.00	0.00	0.00	¢	9 452 00	¢	219,778.00
5	Control Station Antenna System, 746-869 MHz omni, 0	20						20	each	φ 0,455.00	φ	219,778.00	0.000	0.00	0.00	0.00	0.00	φ	0,455.00	φ	219,778.00
	dBd with transmission line, connectors, hoist and ground																				
6	kit	5						5	each	\$ 1,902.00	\$	9,510.00	0.000	0.00	0.00	0.00	0.00	\$	1,902.00	\$	9,510.00
-	Control station combiner, 746-960 MHz, eight port;									• .,••==••	Ŧ	-,						+	.,	+	
	single 800 MHz window filter (requires two antennas																				
7	above)	4						4	each	\$ 10,648.48	\$	42,593.92	0.000	0.00	0.00	0.00	0.00	\$	10,648.48	\$	42,593.92
	Receiver multicoupler, 16-port; 120 VAC, single receive																				
8	filter (800 MHz); requires one antenna above.	1						1	each	\$ 4,639.14		4,639.14	0.000	0.00	0.00	0.00		-	4,639.14		4,639.14
9	Ethernet Switch, Managed, 24-Port, Rack Mount	2						2	each	\$ 2,250.00	\$	4,500.00	0.000	0.00	0.00	0.00	0.00	\$	2,250.00	\$	4,500.00
10								0	1	<b>4</b> 40,000,00	<b>^</b>		0.000	0.00	0.00	0.00	0.00	<b>^</b>	40.000.00	<b>^</b>	~~~~~~
10	Router, Ethernet/T1 Interface, multi-protocol; AES; 4 port							2	each	. ,	\$	39,986.00	0.000	0.00	0.00	0.00	0.00		,	\$	39,986.00
11	TVSS, 120 VAC, Rack-Mount eight-circuit	2						2	each		\$	2,182.00	0.000	0.00	0.00	0.00	0.00	\$	,	\$	2,182.00
12	Misc. site hardware, cables	2						2	lot	<i>t j i i i i i</i>	\$	3,000.00	0.000	0.00	0.00	0.00	0.00	\$	1,500.00	\$	3,000.00
13	Conventional Site Controller	1						1	each	+ /	\$	12,084.00	0.000	0.00	0.00	0.00	0.00	\$	12,084.00	\$	12,084.00
14	Ethernet TVSS, eight-wire, rack mounted	2						2	each	\$ 242.00	\$	484.00	0.000	0.00	0.00	0.00	0.00	\$	242.00	\$	484.00
15	Misc. Spare Equipment (per site)	4						4	lot	\$ 3,000.00	\$	12,000.00	0.000	0.00	0.00	0.00	0.00	\$	3,000.00	\$	12,000.00
16	Dispatch Logging Application License, AES (per site)	3						3	each	\$ 34,580.00	\$	103,740.00	0.000	0.00	0.00	0.00	0.00	\$	34,580.00	\$	103,740.00
	Console logger interface for AES voice encryption, rack-											-									· · · · ·
17	mount	3						3	each	\$ 2,785.00	\$	8,355.00	0.000	0.00	0.00	0.00	0.00	\$	2,785.00	\$	8,355.00
18	Not Used							0	each	\$-	\$	-	0.000	0.00	0.00	0.00	0.00	\$	-	\$	-
19	Not Used							0	each	\$-	\$	-	0.000	0.00	0.00	0.00	0.00	\$	-	\$	-
	Logging recorder, Digital IP, 30 calls, rack mount (no																				
20								0	each	\$ 80,073.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$	80,073.00	\$	-
	Logging recorder interface to Master Site (for trunked									• • • • • • •	•									•	
21	radio traffic)							0	each	\$ 26,886.40	\$	-	0.000	0.00	0.00	0.00	0.00	\$	26,886.40	\$	
	Digital IP Logging Recorder, 120 channel (max), rack																				
22	station (Qty. 1)	1						1	oach	\$ 104,822.80	¢	104 822 80	0.000	0.00	0.00	0.00	0.00	¢.	10/ 822 80	¢	104,822.80
22	Playback Workstation, CPU, 19" LCD non-touch	1						- 1	each	\$ 104,022.00	φ	104,022.00	0.000	0.00	0.00	0.00	0.00	φ	104,022.00	ψ	104,022.00
	monitor, windows, playback application, mouse,																				
23	keyboard	2						2	each	\$ 5,261.00	\$	10,522.00	0.000	0.00	0.00	0.00	0.00	\$	5,261.00	\$	10,522.00
24	KVM switch, eight-port, PS2/USB/VGA	2				İ		2	each	\$ 726.00		1,452.00	0.000	0.00	0.00	0.00	0.00		726.00		1,452.00
25				1	1			0			\$	-	0.000	0.00	0.00	0.00	0.00			\$	
26								0	each	\$-	\$	-	0.000	0.00	0.00	0.00	0.00	\$		\$	
									each	\$-	\$	-	0.000	0.00	0.00	0.00	0.00	\$	-	\$	
- '	Total								00011		•	1,602,615.86	0.000	0.00	0.00	0.00	0.00	Ψ		+	1,602,615.86

Date:	28-Dec-11
Date:	

#### King County P25 Phase 2 Radio System Cost Estimate KING COUNTY P25 PHASE 2 800 MHz RADIO SYSTEM - DISPATCH SYSTEM COST ESTIMATE SYSTEM: EPSCA Sub-Region

#### PREPARED BY: Greg Forrest CHECKED BY: Tom Eckels

	#NAME?												A	verage La	abor Rate =	\$0.00	/Hr.
											Material				Labor		Sub
Item	Description	Center 1	Center 2	Center 3	Center 4	Center 5	Center 6	Center 7	Center Qty	Unit	Unit Cost		xtended Amount	Unit MH	Unit Cost	Extended Amount	Unit Cost
1	Dispatch Workstation Application License, AES, soft instant recall recorder (IRR)	12	4	3	3				22	each	\$ 39,100.00	\$	860,200.00	0.000	0.00	0.00	0.00
	Dispatch Workstation (1 position), CPU, voice interface		-	-	-						+	Ŧ	,				
	module, 19" LCD non-touch screen; Keyboard and																
2	mouse, dual speakers, footswitch	12	4	3	3				22	each	\$ 8,927.00	\$	196,394.00	0.000	0.00	0.00	0.00
3	Conventional Channel Interface (CCI; 4 Ch. 4WE&M / V.24)	2	1	1	1				5	each	\$ 4,960.00	\$	24,800.00	0.000	0.00	0.00	0.00
4	Auxiliary Input/Output Device, IP (alarm/door controls); application software license, basic	2	1	1	1				5	each	\$ 2,240.00	\$	11,200.00	0.000	0.00	0.00	0.00
<u> </u>									<u> </u>	ouon	\$ 2,210.00	Ŷ	11,200.00	0.000	0.00	0.00	0.00
5	Control Station, Backup, 700/800 MHz, P25 PII TDMA, rack mount 20W; desktop control w/microphone	15	5	4	4				28	each	\$ 8,453.00	\$	236,684.00	0.000	0.00	0.00	0.00
	Control Station Antenna System, 746-869 MHz omni, 0 dBd with transmission line, connectors, hoist and ground																
6	kit	4	2	2	2				10	each	\$ 1,902.00	\$	19,020.00	0.000	0.00	0.00	0.00
	Control station combiner, 746-960 MHz, eight port; single 800 MHz window filter (requires two antennas																
7	above)	2	1	1	1				5	each	\$ 10,648.48	\$	53,242.40	0.000	0.00	0.00	0.00
	Receiver multicoupler, 16-port; 120 VAC, single receive																
8	filter (800 MHz); requires one antenna above.								0	each	. ,	-	-	0.000	0.00	0.00	0.00
9	Ethernet Switch, Managed, 24-Port, Rack Mount	2	2	1	1				6	each	\$ 2,250.00	\$	13,500.00	0.000	0.00	0.00	0.00
10	Router, Ethernet/T1 Interface, multi-protocol; AES; 4 port	2	2	1	1				6	each	\$ 19,993.00	\$	119,958.00	0.000	0.00	0.00	0.00
11	TVSS, 120 VAC, Rack-Mount eight-circuit	2	1	1	1				5	each	\$ 1,091.00	\$	5,455.00	0.000	0.00	0.00	0.00
12	Misc. site hardware, cables	2	1	1	1				5	lot	\$ 1,500.00	\$	7,500.00	0.000	0.00	0.00	0.00
13	Conventional Site Controller	1	1	1	1				4	each	\$ 12,084.00	\$	48,336.00	0.000	0.00	0.00	0.00
14	Ethernet TVSS, eight-wire, rack mounted	2	2	1	1				6	each	\$ 242.00	\$	1,452.00	0.000	0.00	0.00	0.00
15	Misc. Spare Equipment (per site)	2	1	1	1				5	lot	\$ 3,000.00	\$	15,000.00	0.000	0.00	0.00	0.00
16	Dispatch Logging Application License, AES (per site)	1	1	1	1				4	each	\$ 34,580.00	\$	138,320.00	0.000	0.00	0.00	0.00
17	Console logger interface for AES voice encryption, rack- mount	1	1	1	1				4	each	\$ 2,785.00	\$	11,140.00	0.000	0.00	0.00	0.00
18	Not Used	1							0	each	\$ -	\$	-	0.000	0.00	0.00	0.00
19	Not Used								0	each		\$	-	0.000	0.00	0.00	0.00
20	Logging recorder, Digital IP, 30 calls, rack mount (no playback station)		1	1	1				3	each			240,219.00	0.000	0.00	0.00	0.00
21	Logging recorder interface to Master Site (for trunked radio traffic)								0	each	\$ 26,886.40	\$	-	0.000	0.00	0.00	0.00
	Digital IP Logging Recorder, 120 channel (max), rack mount; incl. remote replay application and playback																
22	station (Qty. 1)	1							1	each	\$ 104,822.80	\$	104,822.80	0.000	0.00	0.00	0.00
	Playback Workstation, CPU, 19" LCD non-touch monitor, windows, playback application, mouse,																
23	keyboard	1	1	1	1				4	each			21,044.00	0.000	0.00	0.00	0.00
24	KVM switch, eight-port, PS2/USB/VGA	2	1	1	1				5	each			3,630.00	0.000	0.00	0.00	0.00
	\$0								0	each		\$	-	0.000	0.00	0.00	0.00
	\$0								0	each		\$	-	0.000	0.00	0.00	0.00
27	\$0									each	\$-	\$	-	0.000	0.00	0.00	0.00
L	Total							1				\$ 2	,131,917.20			0.00	1

Date: <u>28-Dec-11</u> Date:

				Ye	ar 2011\$
ubo	contract				
t t	Extended Amount		Unit Cost		Extended Total
	0.00	\$	39,100.00	\$	860,200.00
	0.00	\$	8,927.00	\$	196,394.00
	0.00	\$	4,960.00	\$	24,800.00
	0.00	\$	2,240.00	\$	11,200.00
	0.00	Ψ	2,240.00	Ψ	11,200.00
	0.00	\$	8,453.00	\$	236,684.00
	0.00	\$	1,902.00	\$	19,020.00
	0.00	\$	10,648.48	\$	53,242.40
	0.00	\$	4 630 14	\$	
	0.00	\$	4,639.14 2,250.00	φ \$	13,500.00
	0.00	\$	19,993.00	\$	119,958.00
	0.00	\$	1,091.00	\$	5,455.00
	0.00	\$	1,500.00	\$	7,500.00
	0.00	\$	12,084.00	\$	48,336.00
	0.00	\$ \$	242.00	\$ \$	1,452.00
	0.00	<del>۹</del>	3,000.00	э \$	15,000.00
	0.00	÷ \$	2,785.00	¢ \$	11,140.00
	0.00	\$	-	\$	-
	0.00	\$	-	\$	-
	0.00	\$	80,073.00	\$	240,219.00
	0.00	\$	26,886.40	\$	-
	0.00	\$	104,822.80	\$	104,822.80
				<b>,</b>	
	0.00	\$	5,261.00	\$	21,044.00
	0.00	\$	726.00	\$	3,630.00
	0.00	\$	-	\$	-
	0.00	\$	-	\$	-
	0.00	\$	-	\$	-

0.00

\$ 2,131,917.20

#### KING COUNTY P25 PHASE 2 800 MHz RADIO SYSTEM - DISPATCH SYSTEM COST ESTIMATE SYSTEM: SPARES NOTE: Spare costs are included in the individual sub-system worksheets

PREPARED BY: CHECKED BY:

															Average La	abor Rate =	\$0.00	/Hr.		Year	2011
											Mat	erial			Labor		Subo	contract			
ltem	Description	Center 1	Center 2	Center 3	Center 4	Center 5	Center 6	Center 7	Center Qty	Unit	Unit Cost	Extend Amou		Unit MH	Unit Cost	Extended Amount	Unit Cost	Extended Amount	Unit Cost	Exter Tot	ended otal
1	Dispatch Workstation Application License, AES, soft instant recall recorder (IRR)								0	each	\$ 39,100.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 39,100.0	) \$	-
	Dispatch Workstation (1 position), CPU, voice interface									Cuon	¢ 00,100.00	Ŷ		0.000	0.00	0.00	0.00	0.00	• • • • • • • • • • • •	-	
2	module, 19" LCD non-touch screen; Keyboard and mouse, dual speakers, footswitch								0	each	\$ 8,927.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 8,927.0	) \$	-
	Conventional Channel Interface (CCI; 4 Ch. 4WE&M /																		. ,		
3	V.24) Auxiliary Input/Output Device, IP (alarm/door controls);								0	each	\$ 4,960.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 4,960.0	5	-
4	application software license, basic								0	each	\$ 2,240.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 2,240.0	D \$	
	Control Station, Backup, 700/800 MHz, P25 PII TDMA,																				
5	rack mount 20W; desktop control w/microphone								0	each	\$ 8,453.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 8,453.0	) \$	
	Control Station Antenna System, 746-869 MHz omni, 0 dBd with transmission line, connectors, hoist and																				
6	ground kit								0	each	\$ 1,902.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 1,902.0	) \$	
	Control station combiner, 746-960 MHz, eight port; single 800 MHz window filter (requires two antennas																				
7	above)								0	each	\$ 10,648.48	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 10,648.4	3 \$	-
	Receiver multicoupler, 16-port; 120 VAC, single																				
8	receive filter (800 MHz); requires one antenna above.								0	each	\$ 4,639.14	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 4,639.1	ŧ\$	-
9	Ethernet Switch, Managed, 24-Port, Rack Mount								0	each	\$ 2,250.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 2,250.0	D \$	
10	Router, Ethernet/T1 Interface, multi-protocol; AES; 4 port								0	each	\$ 19,993.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 19,993.0	<b>)</b> \$	_
11	TVSS, 120 VAC, Rack-Mount eight-circuit								0	each	\$ 1,091.00		-	0.000	0.00	0.00	0.00	0.00			-
12	Misc. site hardware, cables								0	lot	\$ 1,500.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 1,500.0	C \$	
13	Conventional Site Controller								0	each	\$ 12,084.00	<b>T</b>	-	0.000	0.00	0.00	0.00	0.00			
14 15	Ethernet TVSS, eight-wire, rack mounted Misc. Spare Equipment (per site)								0	each lot	\$ 242.00 \$ 3,000.00	\$ \$	-	0.000	0.00	0.00	0.00	0.00		-	-
15									0	101	\$ 3,000.00	φ	-	0.000	0.00	0.00	0.00	0.00	\$ 3,000.0	<u>,                                    </u>	
16	Dispatch Logging Application License, AES (per site)								0	each	\$ 34,580.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 34,580.0	)\$	-
17	Console logger interface for AES voice encryption, rack- mount								0	each	\$ 2,785.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 2,785.0	o \$	-
18	Not Used								0	each	\$ -	\$	-	0.000	0.00	0.00	0.00	0.00		\$	-
19	Not Used								0	each	\$-	\$	-	0.000	0.00	0.00	0.00	0.00	\$-	\$	-
20	Logging recorder, Digital IP, 30 calls, rack mount (no playback station)								0	each	\$ 80,073.00	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 80,073.0	\$	-
21	Logging recorder interface to Master Site (for trunked radio traffic)								0	each	\$ 26,886.40	\$	-	0.000	0.00	0.00	0.00	0.00	\$ 26,886.4	) \$	-
	Digital IP Logging Recorder, 120 channel (max), rack mount; incl. remote replay application and playback station (Qty. 1)								0	each	\$104,822.80		_	0.000	0.00	0.00	0.00		\$ 104,822.8		
22	Playback Workstation, CPU, 19" LCD non-touch monitor, windows, playback application, mouse,								0	each	φ104,022.00	φ	-	0.000	0.00	0.00	0.00	0.00	φ 104,622.0	) <b>D</b>	
	keyboard								0	each	\$ 5,261.00		-	0.000	0.00	0.00	0.00	0.00			-
	KVM switch, eight-port, PS2/USB/VGA								0	each	\$ 726.00			0.000	0.00	0.00	0.00	0.00			
25									0	each	\$ -			0.000	0.00	0.00	0.00	0.00		\$	-
26 27									0	each	\$ - \$ -	\$ \$	-	0.000	0.00	0.00	0.00	0.00		\$ \$	-
	হত Total									each	φ -		-	0.000	0.00	0.00 <b>0.00</b>	0.00	0.00 <b>0.00</b>	φ -	\$ \$	<u> </u>

Date: 28-Dec-11 Date:

# King County P25 Phase 2 Radio System Cost Estimate KING COUNTY P25 PHASE 2 TRUNKED RADIO SYSTEM - DISPATCH SYSTEM COST ESTIMATE SYSTEM: KING COUNTY P25 PHASE 2 SYSTEM PREPARED BY: Greg Forrest CHECKED BY: Tom Eckels

Date: <u>28-Dec-11</u> Date:

**Assumptions & Source** 

	Assumptions & Source			
ltem	Description	Source	No.	Assumptions
	Dispatch Workstation Application License, AES, soft instant recall recorder (IRR)	Motorola	1	B1905 MCC 7500 ASTRO 25 SOFTWARE
2	Dispatch Workstation (1 position), CPU, voice interface module, 19" LCD non-touch screen; Keyboard and mouse, dual speakers, footswitch	Motorola	2	DDN9650 MCC7500
3	Conventional Channel Interface (CCI; 4 Ch. 4WE&M V.24)	Motorola	3	GGM8000
4	Auxiliary Input/Output Device, IP (alarm/door controls); application software license, basic	Motorola	4	F4543 SDM3000 RTU
5	Control Station, Backup, 700/800 MHz, P25 PII TDMA, rack mount 20W; desktop control w/microphone	Motorola	5	APX7500
6		Motorola	6	Previous Proposals
	Control station combiner, 746-960 MHz, eight port; single 800 MHz window filter (requires two antennas above)	DB-Spectra	7	Qty. 1 - HC111W1-08F; Qty 1 - DB4258S10WT (or similar), w/rack mounting
	Receiver multicoupler, 16-port; 120 VAC, single receive filter (800 MHz); requires one antenna above.	DB-Spectra	8	Qty 1: DBSMC1-16C, Qty 1 - DB4258S10WT (or similar), w/rack mounting
	Ethernet Switch, Managed, 24-Port, Rack Mount Router, Ethernet/T1 Interface, multi-protocol; AES; 4	Motorola	9	2610-24
10	port	Motorola	10	ST6000
	TVSS, 120 VAC, Rack-Mount eight-circuit	Motorola	11	OP820S
	Misc. site hardware, cables	Various	12	Various - Various
	Conventional Site Controller	Motorola	13	GCP8000
	Ethernet TVSS, eight-wire, rack mounted	Motorola	14	DSTSJ100BT
15	Misc. Spare Equipment (per site)	Various	15	N/A
	Dispatch Logging Application License, AES (per site) Console logger interface for AES voice encryption,	Motorola	16	B1905 MCC 7500 ASTRO 25 SOFTWARE
17	rack-mount	Motorola	17	DDN9650 MCC7500
-	Not Used		18	
	Not Used Logging recorder, Digital IP, 30 calls, rack mount (no		19	
20	playback station) Logging recorder interface to Master Site (for trunked	Motorola	20	TT1092
21	radio traffic)	Motorola	21	AIS
	Digital IP Logging Recorder, 120 channel (max), rack mount; incl. remote replay application and playback			
		Nice	22	Previous Proposals - Options
	Playback Workstation, CPU, 19" LCD non-touch monitor, windows, playback application, mouse, keyboard	Motorola	23	DDN9589
	KVM switch, eight-port, PS2/USB/VGA	Motorola	23	DSF1DA108Z
	\$0		66	
	\$0 \$0		67	
	\$0 \$0		68	
00	ΨŸ	1	00	I

Sheet 4 - King County P25 Radio System Dispatch Cost Estimate R1.xlsx Hatfield & Dawson Consulting Engineers

#### Sheet 5 - King County P25 Radio System Microwave Radio Interconnect Cost Estimate

#### Interconnect System Cost Estimate Microwave System Cost Estimate Summary

		Frequency			Number of	
Site/Microwave Hop Type	Configuration	Band	Per Hop Microwave Radio Cost	Per Hop Antenna System Cost	Hops	Extended Cost
Transportation Corridor Spur	MHSB - Non-Diversity	Lower 6 GHz	\$149,644	\$13,369.10	8	\$1,304,104.76
Transportation Corridor Spur	MHSB - Space Diversity	Lower 6 GHz	\$156,120	\$26,738.19	4	\$731,432.76
Urban Area Simulcast Site	Loop Protected Non-Diversity	11 GHz	\$96,448	\$10,230.01	40	\$4,267,120.36
Urban Area Simulcast Site	Loop Protected Space Diversity	11 GHz	\$148,496	\$20,460.02	4	\$675,824.07
Dispatch Center	Loop Protected Non-Diversity	11 GHz	\$96,448	\$10,230.01	18	\$1,920,204.16
				Microwave Radio System Equip	oment Cost	\$8,898,686.11
				Microwave Radio System Instal	lation Cost	\$240,264.53
				Microwave Radio System	Total Cost	\$9,138,950.64

#### King County P25 Phase 2 Radio System Interconnect System Cost Estimate Microwave Radio Equipment Costs

Microwave Radio Equipment Costs	
6 GHz	
NS (1+0) 6 GHz Configuration (per hop)	\$89,220
MHSB (1+1) 6 GHz Configuration (per hop)	\$149,644
NSSD (1+0) 6 GHz Configuration (per hop)	\$156,120
HSSD (1+1) 6 GHz Configuration (per hop)	\$156,120
11 GHz	
NS (1+0) 11 GHz Configuration (per hop)	\$96,448
MHSB (1+1) 11 GHz Configuration (per hop)	\$144,684
NSSD (1+0) 11 GHz Configuration	\$148,496
HSSD (1+1) 11 GHz Configuration	\$148,496
Redundant Alarm and Control System (per hop)	\$100,000

NS = Non Standby - loop protection MHSB - Monitored Hot Standby for spurs

NSSD - Non Standby, Space Diversity

HSSD - Hot Standby, Space Diversity

All radios assume Ethernet operation only, MPLS (Alcatel 9500 MPR)

#### King County P25 Phase 2 Radio System Interconnect System Cost Estimate Microwave Radio Antenna System Costs

Description	Part Number	Cost	Quantity	Extended
		Each		Cost
6ft HP ant single pol 5.725-6.425 GHz CPR137G with Radome	HP6-57W-P1A	\$3,010.00	2	\$ 6,020.00
			_	
Elliptical Waveguide 5.925 - 6.425 GHz Std.	EW52	\$ 10.00	300	\$ 3,000.00
Non-Tunable Conn for EW52 CPR137G Flange	252DE	\$ 267.00	4	\$ 1,068.00
Hanger Kit for EW52, Kit of 10 each	42396A-8	\$ 22.00	8	\$ 176.00
Waveguide Boot, 4" for EW52	WGB4-52	\$ 43.00	2	\$ 86.00
Grounding Kit w/ one hole lug for EW63	204989-4	\$ 18.00	6	\$ 108.00
Hoisting Grip for EW63	24312A	\$ 26.00	4	\$ 104.00
36" Flex-Twist, CPR137G Flanges 5.85-8.2 GHz	F137CCS3	\$ 337.00	2	\$ 674.00
Pressure Window, CPR137G	55001-137	\$ 51.00	2	\$ 102.00
Hardware Kit, 3/8" x 1" bolts, lock washers & nuts	31769-1	\$ 4.59	4	\$ 18.36
Angle Adapter Kit, Stainless steel	31768A	\$ 26.69	6	\$ 160.14
Threaded Rod Support Kit, Stainless steel 12" Long	31771-4	\$ 27.20	4	\$ 108.80
Subtotal				\$ 11,625.30
Markup for price increase (15%)				\$ 1,743.80
Total				\$ 13,369.10

6ft HP ant single pol 5.925-7.125 GHz CPR137G with Radome	HP6-59W-P1A	\$3,052.00	2	\$ 6,104.00
Elliptical Waveguide 6.425 - 7.125 GHz Std.	EW63	\$ 8.00	150	\$ 1,200.00
Non-Tunable Conn for EW63 CPR137G Flange	163DE	\$ 175.00	4	\$ 700.00
Hanger Kit for EW63, Kit of 10 each	42396A-7	\$ 22.00	8	\$ 176.00
Grounding Kit w/ one hole lug for EW63	204989-4	\$ 18.00	6	\$ 108.00
Hoisting Grip for EW63	24312A	\$ 26.00	4	\$ 104.00
Waveguide Boot, 4" for EW63	WGB4-63	\$ 43.00	4	\$ 172.00
36" Flex-Twist, CPR137G Flanges Low VSWR. 6.425-7.125 GHz	F137CCB3	\$ 406.00	2	\$ 812.00
Pressure Window, CPR137G	55001-137	\$ 51.00	2	\$ 102.00
Hardware Kit, 3/8" x 1" bolts, lock washers & nuts	31769-1	\$ 4.59	8	\$ 36.72
Angle Adapter Kit, Stainless steel	31768A	\$ 26.69	6	\$ 160.14
Threaded Rod Support Kit, Stainless steel 12" Long	31771-4	\$ 27.20	4	\$ 108.80
Subtotal				\$ 9,783.66
Markup for price increase (15%)				\$ 1,467.55
Total				\$ 11,251.21

6ft low profile ant single pol 10.0-10.7 GHz CPR90G	VHLP6-10W-6GR	\$2,569.00	2		\$ 5,138.00
Elliptical Waveguide 10.20 - 11.70 GHz Std.	EW90	\$ 8.00	200		\$ 1,600.00
Non-Tunable Conn for EW90 CPR90G Flange	190DE	\$ 190.00	4		\$ 760.00
Waveguide Boot, 4" for EW90	WGB4-90	\$ 43.00	2		\$ 86.00
Hanger Kit for EW90, Kit of 10 each	42396A-5	\$ 18.00	8		\$ 144.00
Grounding Kit w/ one hole lug for EW132	204989-2	\$ 18.00	6		\$ 108.00
Hoisting Grip for EW132	29958	\$ 20.00	2		\$ 40.00
36" Flex-Twist, CPR90G Flanges 8.2-12.4 GHz	F090CCS3	\$ 306.00	2		\$ 612.00
Pressure Window, CPR90G	55001-90	\$ 51.00	2		\$ 102.00
Hardware Kit, 3/8" x 1" bolts, lock washers & nuts	31769-1	\$ 4.59	8		\$ 36.72
Angle Adapter Kit, Stainless steel	31768A	\$ 26.69	6		\$ 160.14
Threaded Rod Support Kit, Stainless steel 12" Long	31771-4	\$ 27.20	4		\$ 108.80
Subtotal					\$ 8,895.66
Markup for price increase (15%)					\$ 1,334.35

Total				\$10,230.01

Antenna costs are per hop (2 antenna systems)

CSI TELECOMMUNICATIONS, INC.

Hatfield & Dawson Consulting Engineers

#### Sheet 6 - King County P25 Radio System Subscriber Equipment Cost Estimate

Cost Estimate Summary Page - Subscriber Units 1/13/2012

ltem	Description	Estimated Price	Port Quantity	Seattle Quantity	King County Gov't Quantity	Valley Com Quantity	EPSCA Quantity	Total Quantity	Estimated Cost
	Non Public Safety Mobiles (APX6500 - No Encryption								
Subscriber Equipment: Mobile	or OTAR)	\$4,954	400	618	600	500	569	2687	\$13,311,398
Subscriber Equipment: Mobile	Non Public Safety install/program	\$500	400	618	600	500	569	2687	\$1,343,500
Subscriber Equipment: Mobile	Public Safety Mobile (APX6500)	\$5,928	300		1911	793	674	3678	\$21,803,184
Subscriber Equipment: Mobile	Public Safety Mobile (APX7500RM)	\$7,130		930	1911			2841	\$20,256,330
Subscriber Equipment: Mobile	Public Safety install/program	\$1,000	300	930		793	674	2697	\$2,697,000
Subscriber Equiment: Mobile	TriBand Mobile (APX7500/800, UHF, VHF)	\$7,932			300			300	\$2,379,600
Subscriber Equipment: Portable	Non Public Safety Portables (APX6000 Type 3 - No Encryption or OTAR)	\$4,810	780	642	500	200	339	2461	\$11,837,410
	Non Public Safety Portables [Waterproof] (APX6000	+ .,===							+==,===,,===
Subscriber Equipment: Portable	Type 3 - No Encryption or OTAR)	\$4,810		246				246	\$1,183,260
Subscriber Equipment: Portable	Non Public Safety program	\$75	780	888	500	200	339	2707	\$203,025
Subscriber Equipment: Portable	Public Safety Portable (APX6000 Type 3)	\$5,784	500		3640	2171	1159	7470	\$43,206,480
Subscriber Equipment: Portable	Public Safety Portable (APX7000)	\$7,373		941				941	\$6,937,993
Subscriber Equipment: Portable	Public Safety program	\$75	500	941	3640	2171	1159	8411	\$630,825
Subscriber Equimpment: Portable	TriBand Portable (APX7000 700/800, UHF, VHF)	\$8,015			300			300	\$2,404,500
	Fixed Control Station (APX7500 - 700/800 MHz -with								
Subscriber Equipment: Consolette	antenna system)	\$8,453	20	189			154	363	\$3,068,439
Subscriber Equipment: Consolette	Control Station/Consolette Program/Install	\$500	20	189			154	363	\$181,500
						Subscribe	r Equipmen	t Sub-Total	\$126,388,594
					Subscribe		t Installatio		\$5,055,850
						Subs	criber Equi	ment Total	\$131,444,444

Hatfield & Dawson Consulting Engineers

## APX 7500 PUBLIC SAFETY MOBILE RADIO - 800 MHz & VHF WITH ENCRYPTION, OTAR, & OTAP

APX7500 DUAL BAND MID POWER	\$1,818.00
700/800MHZ BAND	\$0.00
VHF BAND	\$321.00
UHF BAND	\$321.00
ENABLE DUAL BAND OPERATION (VHF)	\$481.00
ENABLE DUAL BAND OPERATION (UHF)	\$481.00
APX O5 CONTROL HEAD	\$346.00
CONTROL HEAD SOFTWARE	\$0.00
REMOTE MOUNT MID POWER	\$238.00
ASTRO DIGITAL CAI OPERATION	\$413.00
SMARTZONE OPERATION APX	\$1,201.00
P25 TRUNKING SOFTWARE	\$241.00
ANT 3DB GAIN 762-870MHZ	\$31.00
VHF ANT WIDEBAND 136-174 MHZ	\$61.00
AES ENCRYPTION APX	\$381.00
TDMA OPERATION	\$321.00
OVER THE AIR PROVISIONING	\$81.00
GPS ANTENNA	\$61.00
GPS ACTIVATION	\$81.00
ENCRYPTION P25 & MDC OTAR	\$593.00
RS232 PACKET DATA INTERFACE	\$161.00
ADVANCED SYSTEM KEY - SOFTWARE KEY	\$0.00
PALM MIC	\$58.00
AUXILARY SPEAKER (7.5 WATT)	\$49.00
2 YR REPAIR SERVICE PLAN	\$193.00
APX 7500 PUBLIC SAFETY MOBILE RADIO - TOTAL	\$7,932.00

## APX 7500 PUBLIC SAFETY MOBILE RADIO - 800 MHz & VHF WITH ENCRYPTION, OTAR, & OTAP

	<b>•</b> • • • • • •
APX7500 DUAL BAND MID POWER	\$1,818.00
700/800MHZ BAND	\$0.00
VHF BAND	\$321.00
ENABLE DUAL BAND OPERATION	\$481.00
APX O5 CONTROL HEAD	\$346.00
CONTROL HEAD SOFTWARE	\$0.00
REMOTE MOUNT MID POWER	\$238.00
ASTRO DIGITAL CAI OPERATION	\$413.00
SMARTZONE OPERATION APX	\$1,201.00
P25 TRUNKING SOFTWARE	\$241.00
ANT 3DB GAIN 762-870MHZ	\$31.00
VHF ANT WIDEBAND 136-174 MHZ	\$61.00
AES ENCRYPTION APX	\$381.00
TDMA OPERATION	\$321.00
OVER THE AIR PROVISIONING	\$81.00
GPS ANTENNA	\$61.00
GPS ACTIVATION	\$81.00
ENCRYPTION P25 & MDC OTAR	\$593.00
RS232 PACKET DATA INTERFACE	\$161.00
ADVANCED SYSTEM KEY - SOFTWARE KEY	\$0.00
PALM MIC	\$58.00
AUXILARY SPEAKER (7.5 WATT)	\$49.00
2 YR REPAIR SERVICE PLAN	\$193.00
	• •
APX 7500 PUBLIC SAFETY MOBILE RADIO - TOTAL	\$7,130.00
	•

## APX 7500 PUBLIC SAFETY MOBILE RADIO - 800 MHz WITH ENCRYPTION, OTAR & OTAP

	¢1 010 00
APX7500 DUAL BAND MID POWER	\$1,818.00
700/800MHZ BAND	\$0.00
VHF BAND	
ENABLE DUAL BAND OPERATION	
APX O5 CONTROL HEAD	\$346.00
CONTROL HEAD SOFTWARE	\$0.00
REMOTE MOUNT MID POWER	\$238.00
ASTRO DIGITAL CAI OPERATION	\$413.00
SMARTZONE OPERATION APX	\$1,201.00
P25 TRUNKING SOFTWARE	\$241.00
ANT 3DB GAIN 762-870MHZ	\$31.00
VHF ANT WIDEBAND 136-174 MHZ	\$61.00
AES ENCRYPTION APX	\$381.00
TDMA OPERATION	\$321.00
OVER THE AIR PROVISIONING	\$81.00
GPS ANTENNA	\$61.00
GPS ACTIVATION	\$81.00
ENCRYPTION P25 & MDC OTAR	\$593.00
RS232 PACKET DATA INTERFACE	\$161.00
ADVANCED SYSTEM KEY - SOFTWARE KEY	\$0.00
PALM MIC	\$58.00
AUXILARY SPEAKER (7.5 WATT)	\$49.00
2 YR REPAIR SERVICE PLAN	\$193.00
APX 7500 PUBLIC SAFETY MOBILE RADIO - TOTAL	\$6,328.00

## APX 6500 PUBLIC SAFETY MOBILE RADIO - 800 MHz WITH ENCRYPTION, OTAR, & OTAP

APX 6500 PUBLIC SAFETY MOBILE RADIO - TOTAL	\$5,928.00
ADVANCED SYSTEM KEY - SOFTWARE KEY	\$0.00
RS232 PACKET DATA INTERFACE	\$161.00
ENCRYPTION P25 & MDC OTAR	\$593.00
GPS ANTENNA	\$61.00
GPS ACTIVATION	\$81.00
OVER THE AIR PROVISIONING	\$81.00
TDMA OPERATION	\$321.00
AES ENCRYPTION APX	\$381.00
2 YEAR REPAIR SERVICE ADVANTAGE	\$148.00
AUXILARY SPKR 7.5 WATT	\$49.00
PALM MIC	\$58.00
ANT 3DB LOW-PROFILE 762-870	\$35.00
REMOTE MOUNT MID POWER	\$238.00
CONTROL HEAD SOFTWARE	\$0.00
APX O5 CONTROL HEAD	\$346.00
P25 TRUNKING SOFTWARE	\$241.00
SMARTZONE OPERATION APX	\$1,201.00
ASTRO DIGITAL CAI OP APX	\$413.00
APX6500 7/800 MHZ MID POWER MOBILE	\$1,520.00

#### APX 6500 PUBLIC SAFETY MOBILE RADIO - 800 MHz NON-PUBLIC SAFETY - NO ENCRYPTON, NO OTAR

APX6500 7/800 MHZ MID POWER MOBILE	\$1,520.00
ASTRO DIGITAL CAI OP APX	\$413.00
SMARTZONE OPERATION APX	\$1,201.00
P25 TRUNKING SOFTWARE	\$241.00
APX O5 CONTROL HEAD	\$346.00
CONTROL HEAD SOFTWARE	\$0.00
REMOTE MOUNT MID POWER	\$238.00
ANTENNA - 3 DB LOW-PROFILE 762-870	\$35.00
PALM MIC	\$58.00
AUXILARY SPKR 7.5 WATT	\$49.00
2 YEAR REPAIR SERVICE ADVANTAGE	\$148.00
AES ENCRYPTION APX	
TDMA OPERATION	\$321.00
OVER THE AIR PROVISIONING	\$81.00
GPS ACTIVATION	\$81.00
GPS ANTENNA	\$61.00
ENCRYPTION P25 & MDC OTAR	
RS232 PACKET DATA INTERFACE	\$161.00
ADVANCED SYSTEM KEY - SOFTWARE KEY	\$0.00
APX 6500 PUBLIC SAFETY MOBILE RADIO - TOTAL	\$4,954.00
5	

## APX 7000 PUBLIC SAFETY PORTABLE RADIO - 800 MHz & VHF WITH ENCRYPTION, OTAR, AND OTAP

APX7000 DIGITAL PORTABLE RADIO	\$2,106.00
700/800MHZ BAND	\$0.00
VHF BAND	\$321.00
UHF BAND	\$321.00
LARGE COLOR DISPLAY AND FULL KEYPAD	\$401.00
ENABLE TRI BAND OPERATION	\$801.00
ASTRO DIGITAL CAI OPERATION	\$413.00
SMARTZONE OPERATION	\$1,201.00
TDMA OPERATION	\$321.00
P25 9600 BAUD TRUNKING	\$241.00
AES ENCRYPTION	\$381.00
ADVANCED SYSTEM KEY	\$0.00
PROGRAMMING OVER P25	\$81.00
RADIO PACKET DATA (IV&D)	\$161.00
ENABLE INTERNAL GPS OPERATION	\$81.00
ASTRO P25 OTAR W/ MULTIKEY	\$593.00
SINGLE UNIT CHARGER	\$101.00
REMOTE SPEAKER MIC. NOISE CANC. EMERGENCY BUTTON	\$86.00
LIION 2900MAH SUBMERSIBLE BATTERY	\$113.00
LIION 2900MAH SUBMERSIBLE BATTERY (SPARE)	\$113.00
LEATHER CARRY CASE WITH 3" FIXED BELT LOOP	\$54.00
2 YR REPAIR SERVICE PLAN	\$125.00
APX 7000 PUBLIC SAFETY PORTABLE RADIO - TOTAL	\$8,015.00

## APX 7000 PUBLIC SAFETY PORTABLE RADIO - 800 MHz & VHF WITH ENCRYPTION, OTAR, AND OTAP

APX7000 DIGITAL PORTABLE RADIO	\$2,106.00
700/800MHZ BAND	\$0.00
VHF BAND	\$0.00
LARGE COLOR DISPLAY AND FULL KEYPAD	\$401.00
ENABLE DUAL BAND OPERATION	\$801.00
ASTRO DIGITAL CAI OPERATION	\$413.00
SMARTZONE OPERATION	\$1,201.00
TDMA OPERATION	\$321.00
P25 9600 BAUD TRUNKING	\$241.00
AES ENCRYPTION	\$381.00
ADVANCED SYSTEM KEY	\$0.00
PROGRAMMING OVER P25	\$81.00
RADIO PACKET DATA (IV&D)	\$161.00
ENABLE INTERNAL GPS OPERATION	\$81.00
ASTRO P25 OTAR W/ MULTIKEY	\$593.00
SINGLE UNIT CHARGER	\$101.00
REMOTE SPEAKER MIC. NOISE CANC. EMERGENCY BUTTON	\$86.00
LIION 2900MAH SUBMERSIBLE BATTERY	\$113.00
LIION 2900MAH SUBMERSIBLE BATTERY (SPARE)	\$113.00
LEATHER CARRY CASE WITH 3" FIXED BELT LOOP	\$54.00
2 YR REPAIR SERVICE PLAN	\$125.00
APX 7000 PUBLIC SAFETY PORTABLE RADIO - TOTAL	\$7,373.00

## APX 7000 PUBLIC SAFETY PORTABLE RADIO - 800 MHz WITH ENCRYPTION, OTAR, AND OTAP

	¢0.406.00
APX7000 DIGITAL PORTABLE RADIO	\$2,106.00
700/800MHZ BAND	\$0.00
VHF BAND	\$0.00
LARGE COLOR DISPLAY AND FULL KEYPAD	\$401.00
ENABLE DUAL BAND OPERATION	
ASTRO DIGITAL CAI OPERATION	\$413.00
SMARTZONE OPERATION	\$1,201.00
TDMA OPERATION	\$321.00
P25 9600 BAUD TRUNKING	\$241.00
AES ENCRYPTION	\$381.00
ADVANCED SYSTEM KEY	\$0.00
PROGRAMMING OVER P25	\$81.00
RADIO PACKET DATA (IV&D)	\$161.00
ENABLE INTERNAL GPS OPERATION	\$81.00
ASTRO P25 OTAR W/ MULTIKEY	\$593.00
SINGLE UNIT CHARGER	\$101.00
REMOTE SPEAKER MIC. NOISE CANC. EMERGENCY BUTTON	\$86.00
LIION 2900MAH SUBMERSIBLE BATTERY	\$113.00
LIION 2900MAH SUBMERSIBLE BATTERY (SPARE)	\$113.00
LEATHER CARRY CASE WITH 3" FIXED BELT LOOP	\$54.00
2 YR REPAIR SERVICE PLAN	\$125.00
APX 7000 PUBLIC SAFETY PORTABLE RADIO - TOTAL	\$6,572.00

#### APX 6000 PUBLIC SAFETY PORTABLE RADIO WITH ENCRYPTION, OTAR, AND OTAP

APX6000 700/800 MODEL PORTABLE	\$2,081.00
SMARTZONE OPERATION	\$961.00
ASTRO DIGITAL CAI OPERATION	\$413.00
P25 9600 BAUD TRUNKING	\$241.00
AES ENCRYPTION	\$381.00
NIMH 2100MAH IP67 BATTERY	\$63.00
NIMH 2100MAH IP67 BATTERY (SPARE)	\$63.00
PROGRAMMING OVER P25 (OTAP)	\$81.00
RADIO PACKET DATA	\$161.00
ENABLE INTERNAL ACTIVATION AND GPS BASIC FUNCTIONALITY	\$81.00
MDC & ASTRO P25 OTAR W/ MULTIKEY	\$593.00
TDMA OPERATION	\$321.00
ADVANCED SYSTEM KEY - SOFTWARE KEY	\$0.00
SINGLE UNIT CHARGER US/NA/CA/LA	\$101.00
RSM, NOISE CANC. EMERGENCY BUTTON 3.5MM JACK IP54	\$86.00
LEATHER CARRY CASE WITH 3" FIXED BELT LOOP	\$54.00
2 YEAR REPAIR SERVICE PLAN	\$103.00
APX 6000 PUBLIC SAFETY PORTABLE RADIO - TOTAL	\$5,784.00

#### APX 6000 PUBLIC SAFETY PORTABLE RADIO WITH ENCRYPTION, OTAR, AND OTAP

APX6000 700/800 MODEL PORTABLE	\$2,081.00
SMARTZONE OPERATION	\$961.00
ASTRO DIGITAL CAI OPERATION	\$413.00
P25 9600 BAUD TRUNKING	\$241.00
AES ENCRYPTION	\$0.00
NIMH 2100MAH IP67 BATTERY	\$63.00
NIMH 2100MAH IP67 BATTERY (SPARE)	\$63.00
PROGRAMMING OVER P25 (OTAP)	\$81.00
RADIO PACKET DATA	\$161.00
ENABLE INTERNAL ACTIVATION AND GPS BASIC FUNCTIONALITY	\$81.00
MDC & ASTRO P25 OTAR W/ MULTIKEY	\$0.00
TDMA OPERATION	\$321.00
ADVANCED SYSTEM KEY - SOFTWARE KEY	\$0.00
SINGLE UNIT CHARGER US/NA/CA/LA	\$101.00
RSM, NOISE CANC. EMERGENCY BUTTON 3.5MM JACK IP54	\$86.00
LEATHER CARRY CASE WITH 3" FIXED BELT LOOP	\$54.00
2 YEAR REPAIR SERVICE PLAN	\$103.00
APX 6000 PUBLIC SAFETY PORTABLE RADIO - TOTAL	\$4,810.00

#### APX 6000 PUBLIC SAFETY PORTABLE RADIO WITHOUT ENCRYPTION, OTAR, AND OTAP

APX6000 700/800 MODEL PORTABLE	\$2,081.00
SMARTZONE OPERATION	\$961.00
ASTRO DIGITAL CAI OPERATION	\$413.00
P25 9600 BAUD TRUNKING	\$241.00
AES ENCRYPTION	\$0.00
NIMH 2100MAH IP67 BATTERY	\$63.00
NIMH 2100MAH IP67 BATTERY (SPARE)	\$63.00
PROGRAMMING OVER P25 (OTAP)	\$81.00
RADIO PACKET DATA	\$161.00
ENABLE INTERNAL ACTIVATION AND GPS BASIC FUNCTIONALITY	\$81.00
MDC & ASTRO P25 OTAR W/ MULTIKEY	\$0.00
TDMA OPERATION	\$321.00
ADVANCED SYSTEM KEY - SOFTWARE KEY	\$0.00
SINGLE UNIT CHARGER US/NA/CA/LA	\$101.00
RSM, NOISE CANC. EMERGENCY BUTTON 3.5MM JACK IP54	\$86.00
LEATHER CARRY CASE WITH 3" FIXED BELT LOOP	\$54.00
2 YEAR REPAIR SERVICE PLAN	\$103.00
APX 6000 PUBLIC SAFETY PORTABLE RADIO - TOTAL	\$4,810.00

## APX 4000 PORTABLE RADIO - NON PUBLIC SAFETY NO ENCRYPTION; WITH OTAP & GPS

APX 4000 PORTABLE RADIO	\$1,681.00
TRUNKING 3600 BAUD OR SOFTWARE TRUNKING 9600 BAUD	\$1,257.00
AES ENCRYPTION	\$381.00
NIMH 2100MAH IP67 BATTERY	\$63.00
NIMH 2100MAH IP67 BATTERY (SPARE)	\$63.00
OVER THE AIR PROVISIONING	\$81.00
RADIO PACKET DATA	\$161.00
ENABLE INTERNAL ACTIVATION AND GPS BASIC FUNCTIONALITY	\$81.00
TDMA OPERATION	\$321.00
ADVANCED SYSTEM KEY - SOFTWARE KEY	\$0.00
SINGLE UNIT CHARGER	\$101.00
RSM, NOISE CANC. EMERGENCY BUTTON 3.5MM JACK IP54	\$86.00
LEATHER CARRY CASE WITH 3" FIXED BELT LOOP	\$54.00
2 YEAR REPAIR SERVICE PLAN	\$103.00
APX 4000 PORTABLE RADIO - TOTAL	\$4,433.00

Sheet 7 - King County Radio System Lease & FTE Cost NPV Calculations

King County Radio System Cost Estimate Lease Cost NPV Calculation

1/5/2012

New Tower and New Shelter

Net Present Value of Lease Payments Over 7	
, Years (84 Payments)	(\$173,356.58)
Annual Interest Rate	3.00%
Annual Inflation Rate Initial Monthly Lease Payment	3.00% \$2,100
Initial Monthly Lease Payment	\$2,100
Lease Payment 1	-\$2,100
Lease Payment 2	-\$2,100
Lease Payment 3	-\$2,100
Lease Payment 4	-\$2,100
Lease Payment 5 Lease Payment 6	-\$2,100 -\$2,100
Lease Payment 7	-\$2,100
Lease Payment 8	-\$2,100
Lease Payment 9	-\$2,100
Lease Payment 10	-\$2,100
Lease Payment 11	-\$2,100
Lease Payment 12	-\$2,100 -\$2,163
Lease Payment 13 Lease Payment 14	-\$2,103
Lease Payment 15	-\$2,163
Lease Payment 16	-\$2,163
Lease Payment 17	-\$2,163
Lease Payment 18	-\$2,163
Lease Payment 19	-\$2,163
Lease Payment 20 Lease Payment 21	-\$2,163 -\$2,163
Lease Payment 22	-\$2,163
Lease Payment 23	-\$2,163
Lease Payment 24	-\$2,163
Lease Payment 25	-\$2,228
Lease Payment 26 Lease Payment 27	-\$2,228 -\$2,228
Lease Payment 27 Lease Payment 28	-\$2,228 -\$2,228
Lease Payment 29	-\$2,228
Lease Payment 30	-\$2,228
Lease Payment 31	-\$2,228
Lease Payment 32	-\$2,228
Lease Payment 33	-\$2,228 -\$2,228
Lease Payment 34 Lease Payment 35	-\$2,228
Lease Payment 36	-\$2,228
Lease Payment 37	-\$2,295
Lease Payment 38	-\$2,295
Lease Payment 39	-\$2,295
Lease Payment 40	-\$2,295
Lease Payment 41 Lease Payment 42	-\$2,295 -\$2,295
Lease Payment 43	-\$2,295
Lease Payment 44	-\$2,295
Lease Payment 45	-\$2,295
Lease Payment 46	-\$2,295
Lease Payment 47	-\$2,295
Lease Payment 48 Lease Payment 49	-\$2,295 -\$2,364
Lease Payment 50	-\$2,364
Lease Payment 51	-\$2,364
Lease Payment 52	-\$2,364
Lease Payment 53	-\$2,364
Lease Payment 54	-\$2,364
Lease Payment 55 Lease Payment 56	-\$2,364 -\$2,364
Lease Payment 57	-\$2,364
Lease Payment 58	-\$2,364
Lease Payment 59	-\$2,364
Lease Payment 60	-\$2,364 -\$2,434
Lease Payment 61 Lease Payment 62	-\$2,434 -\$2,434
Lease Payment 63	-\$2,434
Lease Payment 64	-\$2,434
Lease Payment 65	-\$2,434
Lease Payment 66	-\$2,434
Lease Payment 67 Lease Payment 68	-\$2,434 -\$2,434
Lease Payment 69	-\$2,434
Lease Payment 70	-\$2,434
Lease Payment 71	-\$2,434
Lease Payment 72	-\$2,434
Lease Payment 73	-\$2,508
Lease Payment 74 Lease Payment 75	-\$2,508 -\$2,508
Lease Payment 75	-\$2,508
Lease Payment 77	-\$2,508
Lease Payment 78	-\$2,508
Lease Payment 79	-\$2,508
Lease Payment 80	-\$2,508
Lease Payment 81	-\$2,508 -\$2,508
Lease Payment 82 Lease Payment 83	-\$2,508 -\$2,508
Lease Payment 85	-\$2,508
	. ,
Sum of Lease Payments	-\$133,790

Lease Cost Net Present Value Calculation New Tower Only

#### 1/13/2012

Years (84 Payments)	(\$86,678.29
Annual Interest Rate	3.00%
Annual Inflation Rate Initial Monthly Lease Payment	3.00% \$1,050
	\$1,050
Lease Payment 1	-\$1,050
Lease Payment 2	-\$1,050
Lease Payment 3	-\$1,050
Lease Payment 4	-\$1,050
Lease Payment 5	-\$1,050
Lease Payment 6	-\$1,050
Lease Payment 7 Lease Payment 8	-\$1,050 -\$1,050
Lease Payment 9	-\$1,050
Lease Payment 10	-\$1,050
Lease Payment 11	-\$1,050
Lease Payment 12	-\$1,050
Lease Payment 13	-\$1,082
Lease Payment 14	-\$1,082
Lease Payment 15	-\$1,082
Lease Payment 16	-\$1,082
Lease Payment 17	-\$1,082
Lease Payment 18 Lease Payment 19	-\$1,082 -\$1,082
Lease Payment 20	-\$1,082
Lease Payment 20	-\$1,082
Lease Payment 22	-\$1,082
Lease Payment 23	-\$1,082
Lease Payment 24	-\$1,082
Lease Payment 25	-\$1,114
Lease Payment 26	-\$1,114
Lease Payment 27	-\$1,114
Lease Payment 28	-\$1,114
Lease Payment 29 Lease Payment 30	-\$1,114 -\$1,114
Lease Payment 30	-\$1,114 -\$1,114
Lease Payment 32	-\$1,114
Lease Payment 33	-\$1,114
Lease Payment 34	-\$1,114
Lease Payment 35	-\$1,114
Lease Payment 36	-\$1,114
Lease Payment 37	-\$1,14
Lease Payment 38	-\$1,14
Lease Payment 39	-\$1,14
Lease Payment 40 Lease Payment 41	-\$1,14 -\$1,14
Lease Payment 42	-\$1,14
Lease Payment 43	-\$1,14
Lease Payment 44	-\$1,14
Lease Payment 45	-\$1,14
Lease Payment 46	-\$1,14
Lease Payment 47	-\$1,14
Lease Payment 48 Lease Payment 49	-\$1,14
Lease Payment 50	-\$1,182 -\$1,182
Lease Payment 51	-\$1,182
Lease Payment 52	-\$1,182
Lease Payment 53	-\$1,18
Lease Payment 54	-\$1,182
Lease Payment 55	-\$1,182
Lease Payment 56	-\$1,18
Lease Payment 57	-\$1,18
Lease Payment 58	-\$1,18
Lease Payment 59 Lease Payment 60	-\$1,182
Lease Payment 60	-\$1,18 -\$1,21
Lease Payment 62	-\$1,21
Lease Payment 63	-\$1,21
Lease Payment 64	-\$1,21
Lease Payment 65	-\$1,21
Lease Payment 66	-\$1,21
Lease Payment 67	-\$1,21
Lease Payment 68	-\$1,21
Lease Payment 69	-\$1,21
Lease Payment 70 Lease Payment 71	-\$1,21 -\$1,21
Lease Payment 71 Lease Payment 72	-\$1,21 -\$1,21
Lease Payment 72 Lease Payment 73	-\$1,21 -\$1,25
Lease Payment 74	-\$1,254
Lease Payment 75	-\$1,25
Lease Payment 76	-\$1,254
Lease Payment 77	-\$1,25
Lease Payment 78	-\$1,25
Lease Payment 79	-\$1,25
Lease Payment 80	-\$1,25
Lease Payment 81	-\$1,25
Lease Payment 82 Lease Payment 83	-\$1,254 -\$1,254
Lease Payment 83	-\$1,254
	ر حرد ب

FTE Cost Net Present Value Calculation Project Manager

1/13/2012

Net Present Value of PM Monthly Salary	
over 7 Years (84 Payments)	(\$780,432.28)
Annual Interest Rate Annual Inflation Rate	3.00% 2.60%
Initial Annual Salary	\$ 160,000.00
Initial Monthly Salary Payment	\$13,333
	4
Monthly Salary Payment 1 Monthly Salary Payment 2	-\$13,333 -\$13,333
Monthly Salary Payment 3	-\$13,333
Monthly Salary Payment 4	-\$13,333
Monthly Salary Payment 5	-\$13,333
Monthly Salary Payment 6	-\$13,333
Monthly Salary Payment 7 Monthly Salary Payment 8	-\$13,333 -\$13,333
Monthly Salary Payment 9	-\$13,333
Monthly Salary Payment 10	-\$13,333
Monthly Salary Payment 11	-\$13,333
Monthly Salary Payment 12	-\$13,333
Monthly Salary Payment 13 Monthly Salary Payment 14	-\$13,680 -\$13,680
Monthly Salary Payment 14	-\$13,680
Monthly Salary Payment 16	-\$13,680
Monthly Salary Payment 17	-\$13,680
Monthly Salary Payment 18	-\$13,680
Monthly Salary Payment 19 Monthly Salary Payment 20	-\$13,680
Monthly Salary Payment 20 Monthly Salary Payment 21	-\$13,680 -\$13,680
Monthly Salary Payment 22	-\$13,680
Monthly Salary Payment 23	-\$13,680
Monthly Salary Payment 24	-\$13,680
Monthly Salary Payment 25	-\$14,036
Monthly Salary Payment 26	-\$14,036
Monthly Salary Payment 27 Monthly Salary Payment 28	-\$14,036 -\$14,036
Monthly Salary Payment 29	-\$14,036
Monthly Salary Payment 30	-\$14,036
Monthly Salary Payment 31	-\$14,036
Monthly Salary Payment 32	-\$14,036
Monthly Salary Payment 33	-\$14,036
Monthly Salary Payment 34	-\$14,036
Monthly Salary Payment 35 Monthly Salary Payment 36	-\$14,036 -\$14,036
Monthly Salary Payment 37	-\$14,401
Monthly Salary Payment 38	-\$14,401
Monthly Salary Payment 39	-\$14,401
Monthly Salary Payment 40	-\$14,401
Monthly Salary Payment 41	-\$14,401
Monthly Salary Payment 42 Monthly Salary Payment 43	-\$14,401 -\$14,401
Monthly Salary Payment 44	-\$14,401
Monthly Salary Payment 45	-\$14,401
Monthly Salary Payment 46	-\$14,401
Monthly Salary Payment 47	-\$14,401
Monthly Salary Payment 48	-\$14,401
Monthly Salary Payment 49 Monthly Salary Payment 50	-\$14,775 -\$14,775
Monthly Salary Payment 51	-\$14,775
Monthly Salary Payment 52	-\$14,775
Monthly Salary Payment 53	-\$14,775
Monthly Salary Payment 54	-\$14,775
Monthly Salary Payment 55	-\$14,775
Monthly Salary Payment 56	-\$14,775
Monthly Salary Payment 57 Monthly Salary Payment 58	-\$14,775 -\$14,775
Monthly Salary Payment 59	-\$14,775
Monthly Salary Payment 60	-\$14,775
Monthly Salary Payment 61	-\$15,159
Monthly Salary Payment 62	-\$15,159
Monthly Salary Payment 63 Monthly Salary Payment 64	-\$15,159 -\$15,159
Monthly Salary Payment 65	-\$15,159 -\$15,159
Monthly Salary Payment 66	-\$15,159
Monthly Salary Payment 67	-\$15,159
Monthly Salary Payment 68	-\$15,159
Monthly Salary Payment 69	-\$15,159
Monthly Salary Payment 70 Monthly Salary Payment 71	-\$15,159 -\$15,159
Monthly Salary Payment 72	-\$15,159
Monthly Salary Payment 73	-\$15,553
Monthly Salary Payment 74	-\$15,553
Monthly Salary Payment 75	-\$15,553
Monthly Salary Payment 76	-\$15,553
Monthly Salary Payment 77	-\$15,553
Monthly Salary Payment 78 Monthly Salary Payment 79	-\$15,553 -\$15,553
Monthly Salary Payment 80	-\$15,553
Monthly Salary Payment 81	-\$15,553
Monthly Salary Payment 82	-\$15,553
Monthly Salary Payment 83	-\$15,553
Monthly Salary Payment 84	-\$15,553
Sum of Salary Payments	-\$842,696
. , . ,	, = .=,000

Sheet 8 - King County P25 Radio System Cost Estimate – Assumptions

King County P25 Phase 2 Radio System Cost Estimate Cost Estimate Assumptions

	ASSUMPTIONS BY CATEGORY
	System Coverage Requirements and Site Assumptions
	97% Service Area Reliability coverage in the bounded area of King county [The
	bounded area includes the entire geography of each county west of the
	Cascade Mountain foothill boundary, all cities, and all major roadways. The foothill boundary is defined here as the first topographic contour that exceeds
1	750 feet of elevation as you travel eastward from Puget Sound.]
2	97% Service Area Reliability coverage in each city (all cities are be included within the identified bounded areas)
	97% Service Area Reliability coverage in the bounded area defined by the
	transportation corridors consisting of the portions of I-90, SR 2 and SR 410 that are within King County and outside of the "urban" bounded area defined
3	
	Belt-level portable radio coverage (talk-in and talk-out) with a half-wave
	dipole antenna on the portable radiothe assumed loss relative to a half-wave
4	dipole in free space for this configuration is -14.3 dB
	System will include a VHF/UHF subsystem (2 channels VHF and 2 Channels
_	UHF) with coverage of the urbanized and transportation corridors with the
5	same level of Service Area Reliability defined above.
	56 Sites - 28 Existing Sites; 28 New Sites (See "King County P25 Phase 2 Radio
6	System - Cost Estimate Introduction and Narrative" document for a description of the analysis used to determine number of sites required.)
	7-Year Buildout for Existing and New Sites (Entire New System)
	Radio Site Equipment Assumptions
8	The cost estimate assumes at total of 56 repeater sites, 2 P25 master sites (dual-redundant and geographically separate), and 9 simulcast prime sites.
	The second s
1	Prime sites are assumed to be configured with the "high availability" option,
9	which provides a higher number of available channels in the event of a switch failure at the prime site than the standard configuration.
	Urbanized area simulcast sites are assumed to have 28 800 MHz base stations
10	(24 base stations repeaters for voice channel use, and 4 base stations used for redundant control channels).
	Transportation corridor simulcast repeater sites with 800 MHz channels only are assumed to have 8 800 MHz base stations (6 base station repeaters for
11	voice operation and 2 base stations used for redundant control channels).
	Transportation corridor simulcast repeater sites with 800 MHz, VHF and UHF
	channels are assumed to have 8 800 MHz base stations (6 base station
42	repeaters for voice operation and 2 base stations used for redundant control
	channels), 2 VHF base station repeaters and 2 UHF base station repeaters. 10 Sites (out of 56 total) will have both 800 Mhz and VHF/UHF radios.
	All Existing IR sites in urbanized portion of County incorporated into simulcast
14	systems whenever possible 3 800 MHz TX antennas and 2 800 MHz RX antennas at urbanized area (28
15	channel) 800 MHz simulcast sites
16	2 800 Mhz TX antennas and 2 800 MHz RX antennas at transportation corridor 800 MHz sites
	1 VHF TX antennas and 1 VHF RX antennas, 1 UHF TX antenna and 1 UHF RX
17	antenna at sites with VHF and UHF base stations in addition to 800 MHz base stations and antennas
	11.5 dBd gain omnidirectional antennas for 800 MHz sub-systems
	6.0 dBd gain omnidirectional antennas for VHF sub-systems 6.0 dBd gain omnidirectional antennas for UHF sub-systems
	1-5/8" transmission line for 800 MHz antennas
22	7/8" transmission line for VHF & UHF antennas
23	Dispatch System Assumptions
24	Number of dispatch centers and dispatch positions based on existing dispatch facilities in King County 800 MHz Radio System
27	Control stations used for both dispatch position backup and for off-the-air
25	voice recording (both functions performed by single control stations on a talkgroup-by-talkgroup basis
23	
26	Interconnect System Assumptions Microwave Radio Interconnect between sites (worst case)
	Two Radios per Site (Repeater Sites + Dispatch Centers)
-	Multiple Protected Loops in Urban Coverage Area Monitored Hot Standby Spurs in Transportation Corridors
	Antenna Costs are per hop (2 antenna systems)
31	Urban Area Simulcast Sites are on protected loops
32	Transportation corridor sites are on MHSB (Monitored Hot Standby) Spurs
	4 hops of loop-protected space diversity 4 hops of MHSB loop protected space diversity
34	4 hops of MHSB loop protected space diversity
25	Equipment Shelter and Tower Assumptions
35	10' X 25' Equipment Shelters assumed for all sites with new shelters
26	Equipment Shelter Cost includes all AC power equipment, including integrated
	main panel, 42 breaker sub-panel, input surge arrestors, and transfer switch Equipment Shelter Cost includes HVAC
	Fire Protection System assumed for all new shelters
	180' Self Supporting Towers assumed for all sites with new towers All new towers comply with EIA-222-G Standard
-	Site Development Assumptions See "Appendix A - King County P25 Radio System - Site Development & Land
41	Use Cost Assumptions" Document
42	Site topography is such that retaining walls and other site stabilization measures are not required
43	Sites have power and telco, microwave, or fiber avaliable.
44	Dual prime generator scenario is not included
	Consultant Cost Assumptions See "Appendix A - King County P25 Radio System - Site Development & Land
45	See "Appendix A - King County P25 Radio System - Site Development & Land Use Cost Assumptions" Document

## Appendix A - King County P25 Radio System - Site Development & Land Use Cost Assumptions

## APPENDIX A - KING COUNTY P25 RADIO SYSTEM – SITE DEVELOPMENT/LAND USE COST ESTIMATE ASSUMPTIONS

12.30.11

## Leasing:

25 hrs – New site which includes obtaining owner contact info, prep correspondence, TC s, coordination with County legal staff, expenses for copies, scans, etc. Does not include legal fees – assumption is that the County will do the preparation of lease documents, and review of those documents

### Scenario # 1:

Assumes collocating (adding) antennas which will trigger need for the following:

- 1. No land use approval needed,
- 2. BP (contractor to include electrical permit in contract), 6,350 = 62.5 hrs + 100 for expenses and an additional 200 for Application fee
- 3. FCC Form 621 (adding antenna), \$7,100 = 70 hrs + \$100 for expenses
- 4. NEPA Checklist (\$ 2,700 = 26.5 hrs + \$ 50 for expenses)
- 5. Construction/Admin 2,000 20 hrs for construction support (no site visits)

### Scenario # 2:

<u>Assumes site modifications</u> (adding new generator and fuel tank in addition to collocating new antennas on the existing tower) which will trigger need for the following:

- 1. Pre Application for LU approval, \$2,230 22 hrs + \$150 expenses + \$1,500 application fee
- 2. Likely Land Use approval (amendment to original LU approval) \$ 7,150 = 69.5 hrs + \$ 100 expenses
- 3. Survey \$2,00 \$3,500 + \$1,000 (10 hrs) for prep of scope and coordination by MAA
- 4. Geotech \$ 5,500 + \$ 1,000 (10 hrs) for prep of scope, coordination and site visit by MAA
- 6. Electrical Engineering Subconsultant \$3,500 + \$2,000 bidding & constr support + \$500 (10 hrs) for dwg review & coordination time by MAA
- 7. Mechanical Engineering Subconsultant \$2,000 + \$500 (5 hrs) for dwg review & coordination time by MAA
- 8. BP (contractor to include electrical permit in contract), \$ 6,350 = 62.5 hrs + \$ 100 for expenses) + \$ 800 Application fee
- 9. FCC Form 621 (adding antenna), \$7,100 = 70 hrs + \$100 expenses
- 10. NEPA Checklist (\$2,750 = 26.5 hrs + \$50 expenses)
- 11. Construction/Admin \$ 2,000 20 hrs for construction support (no site visits)

#### Scenario # 3:

<u>Low site - Assumes new site development (new tower, antennas, shelter, generator and fuel tank, fence, landscaping) which will trigger need for the following:</u>

1. FAA/TOWAIR review (determination of no hazard),

## Michael Aippersbach & Associates - Consultants

- 2. Survey \$2,500 \$3,500 + \$1,000 (10 hrs) for prep of scope and coordination by MAA
- 3. Pre Application for LU approval, \$2,200 22 hrs + \$1,500 application fee
- 4. Land use approval (new approval), \$7,150 = 69.5 hrs + \$100 expenses
- 5. Geotech \$5,500 + \$1,000 (10 hrs) for prep of scope, coordination and site visit by MAA
- 6. Electrical Engineering Subconsultant \$3,500 + \$2,000 bidding & constr support + \$500 (10 hrs) for dwg review & coordination time by MAA
- 7. Mechanical Engineering Subconsultant \$2,000 + \$500 (5 hrs) for dwg review & coordination time by MAA
- 8. BP (contractor to include electrical permit in contract), \$6,350 = 62.5 hrs + \$100 for expenses + \$1,800 for Application fee
- 12. FCC Form 620 (new tower, etc), \$7,100 = 70 hrs + \$100 for expenses
- 13. NEPA Checklist (\$2,750 = 26.5 hrs + \$50 for expenses)
- 14. Construction/Admin \$ 2,000 20 hrs for construction support (no site visits)

### Scenario # 4:

<u>High site - As</u>sumes all new site development (new tower, antennas, shelter, generator and fuel tank, fence) which will trigger need for the following:

- 1. FAA/TOWAIR review (determination of no hazard),
- 2. Survey \$2,500 \$3,000 + \$1,000 (10 hrs) for prep of scope and coordination by MAA
- 3. Pre Application for LU approval, 2,200 22 hrs + 1,500 application fee
- 4. Land use approval (new approval), \$7,150 = 69.5 hrs + \$100 expenses
- 5. Electrical Engineering subconsultant \$3,500 + \$2,000 bidding & constr support + \$500 (10 hrs) for dwg review & coordination time by MAA
- 6. Mechanical Engineering subconsultant \$2,000 + \$500 (5 hrs) for dwg review & coordination time by MAA
- 7. Geotech \$ 6,500 \$ 7,000 + \$ 1,000 (10 hrs) for prep of scope, coordination and site visit by MAA
- 8. BP (contractor to include electrical permit in contract), \$6,350 = 62.5 hrs + \$100 for expenses + \$1,800 for Application fee
- 9. FCC Form 620 (new tower, etc), \$7,100 = 70 hrs + \$100 for expenses
- 10. NEPA Checklist (\$2,700 = 26.5 hrs + \$50 for expenses)
- 11. Construction/Admin \$ 2,000 20 hrs for construction support (no site visits)

## Scenario # 5:

<u>Assumes some site modifications (new shelter) in addition to collocating of antennas on existing tower which will trigger need for the following:</u>

- 1. Pre Application for LU approval, \$2,200 22 hrs + \$1,500 application fee
- 2. Likely Land use approval for new shelter (amendment to original LU approval), \$ 7,150 = 69.5 hrs + \$ 100 expenses
- 3. Survey \$2,500 \$3,000 + \$1,000 (10 hrs) for prep of scope and coordination by MAA
- 4. Geotech (if previous unavailable) \$5,500 + \$1,000 (10 hrs) for prep of scope, coordination and site visit by MAA

- 5. Electrical Engineering Subconsultant \$ 3,500 \$ 2,000 bidding & constr support + \$ 500 (10 hrs) for dwg review & coordination time by MAA
- 6. BP (contractor to include electrical permit in contract), 6350 = 62.5 hrs + 100 for expenses + 800 for Application fee
- 7. FCC Form 621 (antenna), \$7,100 = 70 hrs + \$100 for expenses
- 8. NEPA Checklist (\$2,700 = 26.5 hrs + \$50 for expenses)
- 9. Construction/Admin 2,000 20 hrs for construction support (no site visits)

## Scenario # 6:

<u>Assumes site modifications</u> (new tower, demolishing the existing tower) in addition to collocating (adding) of antennas to new tower which will trigger need for the following:

- 1. FAA/TOWAIR review (determination of no hazard),
- 2. Survey 2,500 3,500 + 1,000 (10 hrs) for prep of scope and coordination by MAA
- 3. Pre Application for LU approval, \$2,200 22 hrs + \$1,500 application fee
- 4. Land use approval (amendment to original LU approval), \$7,150 = 69.5 hrs + \$100 expenses
- 5. Geotech (if previous one unavailable) \$5,500 + \$1,000 (10 hrs) for prep of scope, coordination and site visit by MAA
- 6. BP (contractor to include electrical permit in contract), \$6,350 = 62.5 hrs + \$100 for expenses + \$1,200 for Application fee
- 7. Demo permit, 1,000 10 hrs, + 250 for Application fee
- 8. FCC Form 621 (antenna), \$7,100 = 70 hrs + \$100 for expenses
- 9. NEPA Checklist (\$2,700 = 26.5 hrs + \$50 for expenses)
- 10. Construction/Admin 2,000 20 hrs for construction support (no site visits)

## Geotech:

Estimated \$ 5,500 for lowland sites; \$ 6,500 - \$ 7,500 for high sites

## Survey:

Estimated \$ 2,500 - \$ 3,000 for lowland sites; \$ 2,500 - \$ 3,500 for high sites

## **Electrical Engineering Subconsultant:**

Estimated \$ 3,500 + \$ 2,000 for bidding & construction support services

#### **Mechanical Engineering Consultant:** Estimated \$ 2,000

## **Assumptions:**

- FAA/TOWAIR I did not plug any numbers for this task. NOTE: TOWAIR would take <u>1.5 hrs; FAA tasks</u> - filing FAA Form 7460-1 would add an<u>other 8</u> hrs and filing FAA Form 7460-2 would add another 3 hrs
  - Pre-Application Task assumes application prep time for Application, prep of narrative <u>and simple graphics and attendance at pre-application mtg</u>, and prep of notes regarding mtg feedback/results

- Survey based on recent cost figures
- <u>Geotech</u> based on recent cost figures
- <u>Land Us</u>e Application/Approval include prep time for application, coordination with <u>NWTE</u>, assembling documents, attendance at public hearing, and tracking of approval process
- BP includes application prep time, coordination time with NWTE, assembling of docs <u>& d</u>wgs, submittal
- FCC Form 620/621 includes obtaining data from agencies, prep of letter to Tribes; prep of Form and obtaining SHPO clearance from Department of Archaeology & Historic Preservation (DAHP)
- NEPA Checklist includes obtain data from agencies to conduct review; prep of letter + expenses
- Construction/Admin support includes clarifying issues with permitting agency, <u>coordinating special inspections if required</u>, following up with permitting jurisdictions for closeout, obtaining copies of final inspections, etc

hp/michael bus/kg co - h and d.dsk: narrative for cost estimate - 12.30.11

## **Dispatch Centers and Workstations**

IP-type dispatch workstation equipment was assumed, with supporting network equipment. Workstations consist of a positional CPU, 19" non-touch screen LCD display, audio and signaling interface, gooseneck microphone and push-to-talk interfaces. Both select and unselect speakers are provided at each position. Each position was assigned a radio control station and desktop remote control for backup use. Additional control stations were provided for use in the equipment room for greater channel capacity in support of the voice logging equipment. Workstation CPUs were distributed among two managed Ethernet switches and associated routers for connection to the Master Site.

Should the Master site connection be lost, workstations would still have connectivity to the network through backup control stations. Control of local conventional resources would be provided though one or more four-channel conventional site controllers at each center.

Specifically, each center will be equipped with the following:

- Conventional channel interface for legacy and interop channel operation and patching; larger centers equipped with two for added channel capacity
- Conventional site controller (allows for independent console operating with conventional systems should master site link fail)
- Auxiliary alarm input and output devices (for door alarms, controls, etc.)
- One backup radio control station per dispatch workstation position, plus 20% for additional channels; these will also supply audio for local voice logging recorders.
- Control station combiners and associated antennas; larger centers also equipped with a receiver multicoupler for control station receivers.
- Redundant Ethernet switches and routers (split among the workstations)
- Transient voltage surge suppression
- Misc. spare equipment per site
- 30 or 120 channel digital logging recorders, playback stations and AES encryption interface

Dispatch center and workstation assumptions:

- Reuse of existing generator and site UPS backup power systems
- One-year warranty assumed for all hardware, software and services
- No significant facility rehabilitation
- Reuse of existing dispatch furniture, lighting and chairs
- Reuse of existing CAD, E9-1-1 and administrative telephone equipment
- Each site connected to Master Site through leased T1, fiber and/or microwave radio (costs shown elsewhere in report)

END