



Office of the City Manager

CONSENT CALENDAR
July 25, 2023

To: Honorable Mayor and Members of the City Council
 From: Dee Williams-Ridley, City Manager
 Submitted by: Kevin C. Fong, Director of Information Technology
 Subject: Piggyback Contract – SmartWave for City Facility Managed Wi-Fi

RECOMMENDATION

Adopt a Resolution authorizing the City Manager to execute a contract which aligns with the City of Tucson, AZ existing contract and amendments, to provide managed Wi-Fi throughout City of Berkeley facilities in an amount of \$325,000 with an option to extend ongoing Operations and Maintenance (O&M) for an additional year for a total contract value not to exceed \$370,000 through FY2025.

FISCAL IMPACTS OF RECOMMENDATION

This contract will begin in FY2024 and funding in the amount of \$325,000 is available in Department of Information Technology’s Cost Allocation Fund (680). In future years, Operation and Maintenance (O&M) will be included within updated IT Cost Allocation rates.

FY2024	Description
\$221,020.00	Materials and Equipment
\$28,050.00	Survey and Design Services
\$30,930.00	Implementation Services
\$45,000.00	Remote Support Year 1 (O&M)
\$325,000.00	FY2024 Subtotal

FY2025	Description
\$45,000.00	Remote Support Year 2 (O&M)
\$45,000.00	FY2025 Subtotal

\$370,000.00	Total FY2024-2025 Not To Exceed Value
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CURRENT SITUATION AND ITS EFFECTS

The City is rapidly adopting a more mobile workforce, and the platforms that we provide and support are increasingly dependent upon wireless technology. For example, public safety is relying more and more on mobile laptops and tablets and many staff from Planning, Public Works and HHCS are in transit from office to office throughout the workday.

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The City is playing “catch-up” and struggling to establish seamless, enterprise quality wireless access (Wi-Fi) at all City facilities for City staff and for use by the community in City facilities that are open to the public, including the Finance Customer Service Center, the Permit Service Center, the Public Health Clinic, the Mental Health Clinic, and the North and South Berkeley Senior Centers. Additionally, existing wireless access points (WAPs) have been in place for 9+ years and are past end-of-life and due for replacement, on top of the fact that IT has not reached every City facility as of 2023 due to resource constraints.

The City plans to modernize, expand and maintain its wireless infrastructure footprint throughout City facilities by engaging a vendor to provide a turnkey, managed service (a similar model to printer leasing). This will relieve City staff of the overburdening effort to keep Wi-Fi up, and provide a 99% uptime while staff focus on other areas of importance.

Having an enterprise quality Wi-Fi infrastructure is consistent with the City’s Strategic Plan Priority to provide state-of-the-art, well-maintained infrastructure, amenities, and facilities.

ENVIRONMENTAL SUSTAINABILITY AND CLIMATE IMPACTS

Overall cost-effectiveness of Wi-Fi is greater than hard-wired ethernet, as there is no need to fully wire a facility with ethernet cable (comprised of copper and other materials), so the deployment cost of Wi-Fi is significantly less than a hardwired office.

Because Wi-Fi is “radio” based, it has a broader reach within a facility than a hardwired option. Reconfiguration of office space will require less material and labor with Wi-Fi than a hardwired solution, thus reducing the carbon footprint and cost of ownership over a lifespan.

Finally, as the City deploys more advanced technologies, and with the increasing demand from the community, this project will assist in providing community access to Wi-Fi at all City locations. By providing remote access to data, operational efficiencies are increased for staff, and energy and global warming emissions are reduced by both staff and the community.

RATIONALE FOR RECOMMENDATION

Deploying and managing a city-wide Wi-Fi solution requires dedicated staff time, both for monitoring the “uptime” of the system as well as replacing failed hardware. With over 200+ anticipated access points, IT does not have adequate staff to provide for a 99% uptime, let alone, an ability to deploy Wi-Fi throughout all city-wide facilities.

Engaging a vendor to provide a managed service is the logical solution. A vendor will be responsible for the initial deployment of hardware with IT supervision and leadership, management and upkeep of the network, and “truck runs” (service calls) for repair. This

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will make Wi-Fi throughout City facilities as ubiquitous as a telephone and will be an expected service that is available and “just works”.

The City of Tucson, AZ conducted a competitive Request for Proposal (RFP) process that solicited bids for a vendor to provide “Region-Wide Point to Point Wireless System for the Regional Transportation Data Network” and selected SmartWave Technologies LLC (Attachment 1, Contract 120558), which was awarded and accepted on February 15, 2013 with one-year options to extend on an annual basis (Attachments 2 through 11) through February, 2025. The City of Berkeley Information Technology Department is requesting to piggyback off the City of Tucson, AZ contract for the same services.

SmartWave Technologies LLC has extensive experience providing Wi-Fi installation and maintenance services and has a demonstrated, proven track record of completing projects on time and on budget, in addition to having responsive customer service. They are currently contracted by many local municipalities, including Oakland, San Jose, Dublin and Pleasanton. Furthermore, the County of San Mateo, Daly City, San Leandro, Hayward, South San Francisco and Livermore are currently “piggy-backing” off of the Tucson, AZ contract.

ALTERNATIVE ACTIONS CONSIDERED

Staff considered completing these installation services internally, but due to the high volume of existing work, staff do not currently have the capacity or the expertise to perform such a high volume of Wi-Fi installations and ongoing maintenance at all City locations.

CONTACT PERSON

Kevin C. Fong, Director of Information Technology, (510) 981-6541

Attachments:

- 1: Resolution
- 2: Tucson Contract Signed 02/15/2013
- 3: Tucson Renewal Amendments Years 2014 through 2024

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RESOLUTION NO. ##,###-N.S.

PIGGYBACK CONTRACT – SMARTWAVE FOR CITY FACILITY MANAGED WI-FI

WHEREAS, the City is rapidly adopting a more mobile workforce, and the platforms that we provide and support are increasingly dependent upon wireless technology, and

WHEREAS, the City is playing “catch-up” and struggling to establish reliable, enterprise quality and seamless wireless access (Wi-Fi) at all City facilities, both for use by City staff and for use by the community in City facilities that are open to the public, including the Finance Customer Service Center, the Permit Service Center, the Public Health Clinic, the Mental Health Clinic, and the North and South Berkeley Senior Centers, and

WHEREAS, existing wireless access points (WAPs) have been in place for 9+ years and are past end-of-life and due for replacement, on top of the fact that IT has not reached every City facility as of 2023 due to resource constraints, and

WHEREAS, The City plans to modernize, expand and maintain its wireless infrastructure footprint throughout City facilities by engaging a vendor to provide a turnkey, managed service (a similar model to printer leasing). This will relieve City staff of the overburdening effort to keep Wi-Fi up, and provide a 99% uptime, and

WHEREAS, having an enterprise quality Wi-Fi infrastructure is consistent with the City’s Strategic Plan Priority to provide state-of-the-art, well-maintained infrastructure, amenities, and facilities, and

WHEREAS, The City of Tucson conducted a competitive Request for Proposal (RFP) process that solicited bids for a vendor to provide “Region-Wide Point to Point Wireless System for the Regional Transportation Data Network” and selected SmartWave Technologies LLC, which was awarded and accepted on February 15, 2013 with one-year options to extend on an annual basis, and

WHEREAS, the City of Berkeley Information Technology Department is requesting to piggyback off the City of Tucson for the same services.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that the City Manager is authorized to execute a contract which aligns with the City of Tucson, AZ existing contract and amendments, to provide managed Wi-Fi throughout City of Berkeley facilities in an amount of \$325,000 with an option to extend ongoing Operations and Maintenance (O&M) for an additional year for a total contract value not to exceed \$370,000 through FY2025.

CONTRACT AMENDMENT

CITY OF TUCSON DEPARTMENT OF BUSINESS SERVICES
255 W. ALAMEDA, 6TH FLOOR, TUCSON, AZ 85701
P.O. BOX 27210, TUCSON, AZ 85726
PHONE: (520) 837-4143 / FAX: (520) 791-4735
Nora.corral@tucsonaz.gov
ISSUE DATE: January 29, 2023

CONTRACT #120558-01
CONTRACT AMENDMENT NUMBER: TEN (10)
PAGE 1 of 1
NC
SENIOR CONTRACT OFFICER: NORA CORRAL

REGION WIDE POINT TO POINT WIRELESS SYSTEM FOR THE REGIONAL TRANSPORTATION DATA NETWORK

THIS CONTRACT IS AMENDED AS FOLLOWS:

ITEM ONE (1): CONTRACT RENEWAL

Pursuant to the Contract No.120558, Special Terms and Conditions, Paragraph 5 (Term and Renewal), the City is hereby exercising its option to renew the contract for the period of February 16, 2023 through February 15, 2024.

*****End of Amendment*****

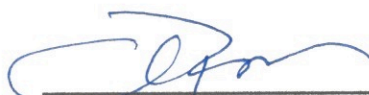
ALL OTHER PROVISIONS OF THE CONTRACT SHALL REMAIN IN THEIR ENTIRETY.

CONTRACTOR: SmartWave Technologies LLC

CONTRACTOR HEREBY ACKNOWLEDGES RECEIPT OF AND UNDERSTANDING OF THE ABOVE AMENDMENT

CITY OF TUCSON: _____

THE ABOVE REFERENCED CONTRACT AMENDMENT IS HEREBY EXECUTED THIS 3rd DAY OF February, 2023, AT TUCSON, ARIZONA.

 2/3/2023
Signature of person authorized to sign Date
AL BROWN - CEO
Name and Title (typed or printed legibly)
SMARTWAVE TECHNOLOGIES LLC
Company Name
2662 HOLCOMB BRIDGE RD #340
Address
al.brown@smartwave.us
Email Address
ALABAMETTA GA 30022
City State Zip

Dan Longanecker for
Director of Business Services and not personally

Contact information for Sales/Account Representative for daily business operations:

JOSH KEHL - AZ OPERATIONS MGR
Name and Title (typed or printed legibly)
443-768-6411
Phone Number
JOSH.KEHL@SMARTWAVE.US
Email Address

REQUEST FOR PROPOSAL AMENDMENT

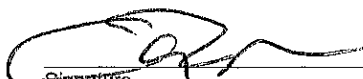
CITY OF TUCSON
DEPARTMENT OF PROCUREMENT
255 W. ALAMEDA, 6TH FLOOR, TUCSON, AZ 85701
P.O. BOX 27210, TUCSON, AZ 85726
ISSUE DATE: JULY 16, 2012

REQUEST FOR PROPOSAL NO. 120558
RFP AMENDMENT NO. SIX (6)
PAGE NO. 2 OF 2
RFP DUE DATE: JULY 27, 2012
RESPONSIBLE CONTRACT OFFICER: NATHAN DAOU

A SIGNED COPY OF THIS AMENDMENT MUST BE SUBMITTED WITH YOUR SEALED PROPOSAL.
THIS REQUEST FOR PROPOSAL IS AMENDED AS FOLLOWS:

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ALL OTHER PROVISIONS OF THE REQUEST FOR PROPOSAL SHALL REMAIN IN THEIR ENTIRETY.
VENDOR HEREBY ACKNOWLEDGES RECEIPT AND UNDERSTANDING OF THE ABOVE AMENDMENT.


Signature _____ Date 7/24/12
A. Beaman / CEO
Typed Name and Title

SMART WAVE
Company Name
1275 Bureau Hwy #101
Address
Sumner GA 30024
City State Zip



APPENDIX 5 – PRICING DETAIL

A5.1 – BACKHAUL LINKS ON EXISTING MESH INFRASTRUCTURE - PRICING DETAIL

MATERIAL / EQUIPMENT DESCRIPTION	MANF. PART #	QUANTITY	UNIT PRICE
Base Station Equipment			
AirSynergy, 4900-5100, Connectorised	SYN2-CN-00-x40-000	50 ea	\$2,640.00
Synergy-2 Ethernet cable assembly with hood (25m)	SYN-ETH-25-1	50 ea	\$120.00
Universal Post Mounting Kit	SYN-U-PMK-1	50 ea	\$48.00
Front Mount 4.9GHz X-Pol 60deg Sector Antenna	SEC60D-4.9-SYN-RC-1	50 ea	\$376.00
Front Mount Antenna bracket kit	SYN-SEC-MKT-1	50 ea	\$28.00
GPS Antenna	GPS-ANT-1	50 ea	\$112.00
AirSynergy GPS Antenna Mounting kit	SYN-GPS-MKT-1	50 ea	\$20.00
WIMAX SW RTU License (per node)	SYN-SW-WIMAX-RTU	50 ea	\$720.00
Encryption License (per node)	BS-LIC-KEY-AES+DES	50 ea	\$84.00
Netspan AirSynergy Air Interface License (per node)	NS-AIL-SYN-ALL	50 ea	\$136.00
Belden - UV Resistant, Riser Rated 4 Pair CAT5E - 150ft	SW-Cat5E-OD	50 ea	\$70.00
Outdoor Gigabit Power-Over-Ethernet (POE) Surge Protector	CMJ8-POE-B	100 ea	\$35.00
8-10/100/1000TX Rugged POE Managed Switch	SW-S-8-PRO	31 ea	\$630.00
Shipping, Consumables, etc.	SW-MISC	31 ea	\$833.00
Subscriber Unit/CPE Equipment			
MIMAX Pro, 4.9-5.3GHz - US	M-Pro-V-V85-500I-US	75 ea	\$823.00
Belden - UV Resistant, Riser Rated 4 Pair CAT5E - 150ft	SW-Cat5E-OD	75 ea	\$75.00
Outdoor Gigabit Power-Over-Ethernet (POE) Surge Protector	CMJ8-POE-B	150 ea	\$35.00
8-10/100/1000TX Rugged POE Managed Switch	SW-S-8-PRO	75 ea	\$630.00
Shipping, Consumables, etc.	SW-MISC	75 ea	\$125.00
Miscellaneous			
Shipping, consumable items required for mounts, etc.	SW-MISC	1 ea	\$7,338.00

PRICING

Materials/Equip	\$403,116.00
Professional Svcs	\$380,950.00
Tax (9.1%)	\$36,683.56
GRAND TOTAL	\$820,749.56

- Design assumes 31 Tower or Building Roof top locations per propagation map provided.
- Design is based on a 1:1.5 ratio of BSUs to CPEs, providing enhanced capacity and flexibility in Base Station install locations.
- Design assumes the City has a 1000BaseT port for switch to connect to City infrastructure.
- Number of BSUs required for full citywide coverage will be greater, as indicated in the Propagation model provided within this response.
- Mobility is provided with the addition of an ASN Gateway. The ASN Gateway pricing is provided in Section A5.6. The ASN Gateway is not required for operation of the Fixed network.
- AAA Server pricing is provided as an option in Section A5.6, but we assume the existing AAA Server currently installed at the City will support this solution. An AAA Server is only required if the City wants to implement Mobility.



A5.2 – WIRELESS LINKS ON SIX PUBLIC FACILITIES - PRICING DETAIL

<u>MATERIAL / EQUIPMENT DESCRIPTION</u>	<u>MANF. PART #</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u>
24GHz PTP Equipment (1Gbps)			
AirFiber 24GHz Point-to-Point 1.4+ Gbps Radio	SW-UBNT-AF-24	4 ea	\$3,431.00
Outdoor Gigabit Power-Over-Ethernet (POE) surge protector	SW-CM18-POE-B	8 ea	\$26.00
48 Vdc Power Over Ethernet power supply and injector 90-264 VAC	SW-POE-48I	8 ea	\$26.00
Belden - UV Resistant, Riser Rated 4 Pair CAT5E - 150ft	SW-Cat5E-OD	8 ea	\$66.00
Non-Pen Mount, 2.91'x3.33' Footprint, 1.31" ODx5' Mast	SW-B3-34x40	8 ea	\$169.00
11GHz PTP Equipment (255Mbps)			
ApexPLUS Link 11 GHz 118Mbps Full Duplex	SWTLAP2-11	2 ea	\$8,647.00
Key - ApexPlus Enable Max Capacity - 255Mbps Full Duplex	SWAP-KEY-2	2 ea	\$625.00
11GHz License Application	11GHz-License	2 ea	\$1,250.00
POE injector/surge suppressor for ApexPlus	SWPOE-GIGE-48	4 ea	\$219.00
Antenna 11 GHz 0.6M/2.4ft Trango	SWAD11G-2-S2	4 ea	\$698.00
Antenna 11 GHz 0.9M/3.5ft Trango	AD11G-3-S2	0 ea	\$1,221.00
Belden - UV Resistant, Riser Rated 4 Pair CAT5E - 150ft	SW-Cat5E-OD	4 ea	\$66.00
Non-Pen Mount, 2.91'x3.33' Footprint, 1.31" ODx5' Mast	SW-B3-34x40	4 ea	\$169.00
Miscellaneous			
Shipping, consumable items required for mounts, etc.	SW-MISC	6 ea	\$250.00

PRICING

Materials/Equip	\$43,172.00	
Professional Svcs	\$31,574.00	
Tax (9.1%)	\$3,928.65	
GRAND TOTAL	\$78,674.65	

A5.3 – 40 MESH RADIOS ON EXISTING INFRASTRUCTURE - PRICING DETAIL

<u>MATERIAL / EQUIPMENT DESCRIPTION</u>	<u>MANF. PART #</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u>
40 Mesh Radios			
7320: 2.4 & 5.8GHz, FCC, 802.11n, DC	73206000	40 ea	\$3,834.00
Weather-Tight Gateway Connector Kit	EC003500	40 ea	\$97.00
Tropos Control Router License	NMCR OUTER	40 ea	\$162.00
Outdoor Gigabit Power-Over-Ethernet (POE) surge protector CM18-POE-B	CM18-POE-B	40 ea	\$42.00
48 Vdc Power Over Ethernet power supply and injector 90-264 VAC	POE-48I	40 ea	\$42.00
Belden - UV Resistant, Riser Rated 4 Pair CAT5E - 250ft	SW-Cat5E-OD	40 ea	\$109.00
Miscellaneous			
Patch cables, power strips, shipping, misc	SW-MISC	40 ea	\$75.00

PRICING

Materials/Equip	\$174,440.00	
Professional Svcs	\$39,460.00	
Tax (9.1%)	\$15,874.04	
GRAND TOTAL	\$229,774.04	



A5.4 – TUCSON INTERNATIONAL AIRPORT (TIA MESH NETWORK) - PRICING DETAIL

<u>MATERIAL / EQUIPMENT DESCRIPTION</u>	<u>MANF. PART #</u>	<u>QUANTITY</u>		<u>UNIT PRICE</u>
Airspan Backhaul				
4.9GHz WiMAX 802.16 BSU - Installed	Menu - Item 1	1	ea	\$8,850.00
4.9GHz WiMAX 802.16 Outdoor SU - Installed	Menu - Item 3	2	ea	\$2,850.00
TIA Mesh Radios				
7320: 2.4 & 5.8GHz, FCC, 802.11n, DC	73206000	11	ea	\$3,834.00
Weather-Tight Gateway Connector Kit	EC003500	11	ea	\$97.00
Tropos Control Router License	NMCRROUTER	11	ea	\$162.00
Outdoor Gigabit Power-Over-Ethernet (POE) surge protector CMJ8-POE-B	CMJ8-POE-B	11	ea	\$42.00
48 Vdc Power Over Ethernet power supply and injector 90-264 VAC	POE-48I	11	ea	\$42.00
Belden - UV Resistant, Riser Rated 4 Pair CAT5E - 250ft	SW-Cat5E-OD	11	ea	\$109.00
6 Ports (10/100/1000T) w/2 Gig SFP Slots, Rugged Managed Switch	8350-604 IGS-2206C	4	ea	\$1,220.00
Mini GBIC LHX (LC/SM 50km)	8330-166	2	ea	\$503.00
Miscellaneous				
Patch cables, power strips, shipping, misc	SW-MISC	11	ea	\$75.00

PRICING

Materials/Equip	\$68,407.00
Professional Svcs	\$18,002.00
Tax (9.1%)	\$6,225.04
GRAND TOTAL	\$92,634.04

A5.5 – MONITOR, MANAGEMENT AND WARRANTY - PRICING DETAIL

<u>MATERIAL / EQUIPMENT DESCRIPTION</u>	<u>MANF. PART #</u>	<u>QUANTITY</u>		<u>UNIT PRICE</u>
Spare Equipment				
AirFiber 24GHz Point-to-Point 1.4+ Gbps Radio	SW-UBNT-AF-24	1	ea	\$3,921.00
AirSynergy, 4900-5100, Connectorised	SYN2-CN-00-x40-000	7	ea	\$2,640.00
MiMAX Pro, 4.9-5.3GHz - US	M-Pro-V-V85-5001-US	7	ea	\$768.00
7320: 2.4 & 5.8GHz, FCC, 802.11n, DC	73206000	2	ea	\$4,121.00
5-Year Extended Warranty				
AirSynergy 4.9GHz Base Station - 5 Year Software Support Warranty		93	ea	\$0.00
Tropos 7320 Mesh Radio - Std SW Sup Multi Radio Router - 5 Year	87-SUSWS002-5	60	ea	\$995.00

PRICING

Materials/Equip	\$95,719.00
Professional Svcs	\$432,000.00
Tax (9.1%)	\$8,710.43
GRAND TOTAL	\$536,429.43

- Pricing does not include monitoring and management of existing infrastructure.
- Pricing does not include warranty upgrades to existing infrastructure.
- Pricing is based on Software Upgrades Only over the 5 Year period for all equipment proposed, with adequate sparing of equipment, as listed in the bill of materials.
- Pricing includes Network Monitoring, Maintenance, Truck Rolls, and Optimization associated with the items proposed in this response.



A5.6 – OPTIONAL ITEMS FOR PROPOSED SOLUTION

MATERIAL / EQUIPMENT DESCRIPTION	MANF. PART #	QUANTITY	UNIT PRICE
ASN Gateway - WIMAX Mobility			
SmartCore 9120 (Page Controller and dual AC power) with ASN-GW Base Software licenses for 1,000 subscribers	ASNGW-9120-BNDL-1K-2PS	1 ea	\$58,165.00
Network Server Hardware and Installation	SW-SRVR	1 ea	\$7,900.00
ASNGW 91xx Product Support - 5 Year	MTCE-TELLABS-SUPP	1 ea	\$34,899.00
AAA Server - Radius Authentication for Mobility Subscribers			
Entry AAA 2.5k subs	AAAB-ENT-DB-2K5-1	1 ea	\$25,786.00
SPARC Enterprise T5120 Server	AAA-SUN-HW-T5120	1 ea	\$22,000.00
BRW AAA Installation and Integration & Professional Services	AAA-IIS-0	1 ea	\$17,500.00
Bridgewater Support - 5 Year	CMAX-MTCE-AAA-10-1	1 ea	\$12,893.00
AirSynergy Warranty Options			
AirSynergy BSU Extended Hardware Warranty - 5 Year		50 ea	\$2,767.00
Tropos Warranty Options			
Tropos Single Radio Mesh Node - Warranty Renewal	SUSWS001	298 ea	\$298.00
Tropos Dual Radio Mesh Node - Warranty Renewal	SUSWS002	106 ea	\$398.00
Tropos Re-Instatement Fee	TroposBS	1 ea	\$19,649.00
Tropos Single Radio Mesh Node - Software Support - 5 Year	SUSWS001-5	298 ea	\$745.00
Tropos Dual Radio Mesh Node - Software Support - 5 Year	SUSWS002-5	106 ea	\$995.00
Tropos Dual Radio Mesh Node - Hardware Support - 5 Year	SUHW002-5	60 ea	\$1,129.00

A5.7 – MESH RADIO ALTERNATE FOR 40 MESH NODES

MATERIAL / EQUIPMENT DESCRIPTION	MANF. PART #	QUANTITY	UNIT PRICE
40 Mesh Radios			
ZoneFlex 802.11n Outdoor Wireless AP, 2.4GHz/5GHz Dual Band, Dual Ethernet ports, POE in and POE out, IP-67 enclosure, PoE injector, flexible mounting kit.	901-7762-US01	40 ea	\$1,500.00
Software Upgrade Only for ZoneFlex 7762, 7762-S, 7762-T - 5 Year	907-7762-2002	40 ea	\$300.00
ZoneDirector 3000, licensed for up to 50 ZoneFlex Access Points.	901-3050-US01	1 ea	\$7,500.00
Partner Premium Support for ZoneDirector 3050, NBD Replacement - 5 Year	908-3050-2002	1 ea	\$3,600.00
Outdoor Gigabit Power-Over-Ethernet (POE) surge protector CMJ8-POE-A	CMJ8-POE-A	40 ea	\$42.00
Belden - UV Resistant, Riser Rated 4 Pair CAT5E - 250ft	SW-Cat5E-OD	40 ea	\$109.00
Miscellaneous			
Patch cables, power strips, shipping, misc	SW-MISC	40 ea	\$75.00

PRICING

Materials/Equip	\$92,140.00
Professional Svcs	\$39,182.00
Tax (9.1%)	\$8,384.74
GRAND TOTAL	\$139,706.74

Key advantages of Ruckus dual band (5GHz/2.4GHz) solution over Tropos are as follows:

- 1) Uses all channels available in 5GHz versus Tropos that only uses 5.8GHz. This provides for more flexibility in an overcrowded unlicensed spectrum.
- 2) Provides up to 300Mbps Data Rate versus Tropos with 54Mbps Data Rate.
- 3) Post warranty support approximately 33% of the Tropos post warranty support.
- 4) \$90,000 savings over Tropos solution.



A5.8 – MESH RADIO ALTERNATE FOR THE AIRPORT MESH SOLUTION

<u>MATERIAL / EQUIPMENT DESCRIPTION</u>	<u>MANF. PART #</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u>
Airspan Backhaul			
4.9GHz WiMAX 802.16 BSU - Installed	Menu - Item 1	1 ea	\$8,850.00
4.9GHz WiMAX 802.16 Outdoor SU - Installed	Menu - Item 3	2 ea	\$2,850.00
TIA Mesh Radios			
ZoneFlex 802.11n Outdoor Wireless AP, 2.4GHz/5GHz Dual Band, Dual Ethernet ports, POE in and POE out, IP-67 enclosure, PoE injector, flexible mounting kit.	901-7762-US01	11 ea	\$1,500.00
Software Upgrade Only for ZoneFlex 7762, 7762-S, 7762-T - 5 Year	907-7762-2002	11 ea	\$300.00
ZoneDirector 3000, licensed for up to 25 ZoneFlex Access Points.	901-3025-US00	1 ea	\$5,000.00
Partner Premium Support for ZoneDirector 3025, NBD Replacement - 5 Year	908-3025-2002	1 ea	\$2,400.00
Outdoor Gigabit Power-Over-Ethernet (POE) surge protector CMJ8-POE-B	CMJ8-POE-B	11 ea	\$42.00
Belden - UV Resistant, Riser Rated 4 Pair CAT5E - 250ft	SW-Cat5E-OD	11 ea	\$109.00
6 Ports (10/100/1000T) w/2 Gig SFP Slots, Rugged Managed Switch	8350-604 IGS-2206C	4 ea	\$1,220.00
Mini GBIC LHX (LC/SM 50km)	8330-166	2 ea	\$503.00
Miscellaneous			
Patch cables, power strips, shipping, misc	SW-MISC	11 ea	\$112.00

PRICING

Materials/Equip	\$50,529.00
Professional Svcs	\$18,002.00
Tax (9.1%)	\$4,598.14
GRAND TOTAL	\$73,129.14



A5.9 – MENU OF PRICING

No.	Product Description	Unit Price (Installed)	Pricing Notes
PTMP Unit Pricing			
1	4.9GHz WIMAX 802.16 BSU - Installed	\$ 8,850.00	Includes Radio, Antenna, Antenna Cable, 150-ft OD-Cat5, Surge Protection, Installation (Does not include conduit, NEMA Enclosure, Electrical Work, or Tower Work). Assumes location is roof top or bucket truck accessible.
2	5GHz Unlicensed BSU (100Mbps) - Installed	\$ 5,000.00	Includes Radio, Antenna, Antenna Cable, 150-ft OD-Cat5, Surge Protection, Installation (Does not include conduit, NEMA Enclosure, Electrical Work, or Tower Work). Assumes location is roof top or bucket truck accessible.
3	4.9GHz WIMAX 802.16 Outdoor SU - Installed	\$ 2,850.00	Includes Radio, Antenna, Antenna Cable, 150-ft OD-Cat5, Surge Protection, Installation (Does not include conduit, NEMA Enclosure, Electrical Work, or Tower Work). Assumes location is roof top or bucket truck accessible.
4	5GHz Unlicensed SU (100Mbps) - Installed	\$ 2,000.00	Includes Radio, Antenna, Antenna Cable, 150-ft OD-Cat5, Surge Protection, Installation (Does not include conduit, NEMA Enclosure, Electrical Work, or Tower Work). Assumes location is roof top or bucket truck accessible.
PTP - Licensed and Unlicensed Option			
5	Licensed 11/18GHz PTP Link (Up to 400Mbps) - Installed	\$ 17,000.00	Includes 2 Radios, Antennas, Power supplies, Surge Protection, 250FT Cat5 Cable, Sled Mounts, License Registration, Path Analysis and Installation (Does not include conduit, electrical work, switches, or NEMA Enclosures)
6	SmartLink 24GHz Unlicensed PTP Link (Up to 1.4Gbps) - Installed	\$ 9,500.00	Includes 2 Radios, Antennas, Power supplies, Surge Protection, 250FT Cat5 Cable, Sled Mounts, Path Analysis and Installation (Does not include conduit, electrical work, switches, or NEMA Enclosures)
7	SmartLink 5GHz Unlicensed 100Mbps PTP Link	\$ 6,000.00	Includes 2 Radios, 2-FT Antennas, Power supplies, Surge Protection, 250FT Cat5 Cable, Sled Mounts, Path Analysis and Installation (Does not include conduit, electrical work, switches, or NEMA Enclosures)
Other Products and Services			
8	Pole Mounted Gateway Mesh Node	\$ 5,475.00	Includes Surge Protection, 250ft OD Cat5, Mesh Radio, Mounting Brackets, Power Supply, Tropos Control License, Installation
9	Vicon Outdoor Pressurized PTZ IP-Camera	\$ 4,950.00	Includes IP PTZ Camera, Dome, Brackets, Power Supply, and Installation (Does not include conduit or electrical work).
10	Mobile Mounted Mesh Node	\$ 3,035.00	Includes mobile radio, mounting hardware and Antenna in Shop and not at location. Customer is responsible for vehicle delivery.
11	Mobile Mounted WIMAX Node	\$ 2,500.00	Includes mobile radio, mounting hardware and Antenna in Shop and not at location. Customer is responsible for vehicle delivery.
12	Mobile Mounted PepWave Radio	\$ 1,200.00	Includes mobile radio, mounting hardware and Antenna in Shop and not at location. Customer is responsible for vehicle delivery.
13	Wireless Equipment Maintenance - 1 Year	\$ 360.00	Per Device - Network monitoring, optimization and Truck Roll services required for maintenance related services. Does not include move, add, change work, or manufacturer extended warranties.
14	CCTV Equipment Maintenance - 1 Year	\$ 220.00	Per Device - Network monitoring, optimization and Truck Roll services required for maintenance related services. Does not include move, add, change work, or manufacturer extended warranties.



15	Airspan Hardware - Percent of List Price		80%	Percent of list price for all Airspan Hardware
16	Airspan Support - Percent of List Price		100%	Percent of list price for all Airspan Support
17	Tropos Hardware - Percent of List Price		75%	Percent of list price for all Tropos Hardware
18	Tropos Support - Percent of List Price		100%	Percent of list price for all Tropos Support
19	Vicon - Percent of List Price		65%	Percent of list price for all Vicon Hardware
20	Ruckus Hardware - Percent of List Price		70%	Percent of list price for all Ruckus Hardware
21	Ruckus Support - Percent of List Price		100%	Percent of list price for all Ruckus Support
22	PepLink CPEs - Percent of List Price		90%	Percent of list price for all PepLink Hardware
23	Wireless Appurtenant Equipment or Subcontractor - Cost plus		20%	Cost plus 20%
24	Senior RF/Network Engineer Hourly Rate	\$	135.00	Does not include Travel or Expenses. Rates may be reduced based on quantity of hours.
25	Project Manager Hourly Rate	\$	110.00	Does not include Travel or Expenses. Rates may be reduced based on quantity of hours.
26	RF or Installation Technician Hourly Rate	\$	75.00	Does not include Travel or Expenses. Rates may be reduced based on quantity of hours.
27	Tower Work Upcharge (if required)	\$	2,400.00	Two Man Crew Per Day

The following pricing notes apply:

- 1 Site Acquisition Services are not included in install estimates. If required, hourly rates of \$150/hr for Site Acquisition services will apply.
- 2 PE Stamped drawings are not included
- 3 Zoning, permitting or environmental services are not included
- 4 RF Planning and Propagation Modeling is not included in Mesh radio pricing
- 5 RF Channel Plan and Spectrum Analysis is included for P2MP and PTP Base Station locations
- 6 Pricing listed is subject to a mutually agreeable contract between SmartWave and City of Tucson
- 7 If not mentioned in the line item, all wireless solutions assume the customer provided switch/router is the demarcation point
- 8 Taxes are not included and will be added to the Final Invoice