To: Board of Education

From: Jerri Kemble, assistant superintendent, educational programs & technology, ext. 2755
Jennifer Fessenden, Supervisor of Information Technology, ext. 2201

Re: Districtwide Wireless Site Survey

Date: January 7, 2016

Background:
Board Goal 6: Create high quality and adaptable district facilities to meet the diverse 21st century educational program needs of all students and enhance student achievement.

Rationale:
As the district continues to move toward more technological devices within the schools, the demand on the wireless infrastructure continues to increase. To ensure adequate coverage for current and expanding demand, a wireless site survey conducted by an independent company is necessary. By using an independent company, the push to sell additional equipment is removed from the conversation. This allows for a truly agnostic assessment. The technology department received recommendations from other vendors and districts. Wireless Training & Solutions (WiTS) is the only company that responded and was able to provide us with the extensive assessment that we were needing in the timeframe we requested. WiTS has also offered free training for our wireless technician. In addition, the proposal includes the wireless site survey, spectrum analysis and detailed survey design reports for a total cost of $78,785.

Recommendation:
The administration recommends contracting Wireless Training & Solutions (WiTS) to conduct a districtwide wireless site survey that includes staff training at a cost of $78,785 to be paid from the General Fund – Technology budget.

Motion:
“I move the Board of Education approve the contract with Wireless Training and Solutions (WiTS) at a cost of $78,785 for a site survey assessment and staff training.”

Wireless Training & Solutions LLC
7800 Miller Drive, Unit B, Frederick CO 80504-3449
http://www.wirelesstrainingsolutions.com - (404)963-0144

Proposal

Prepared by

Wireless Training & Solutions (WiTS)

For

LAWRENCE PUBLIC SCHOOLS

Wireless Site Surveys, Spectrum Analysis, and Detailed Survey Design Reports

Version 1.0

Date: 12/09/15

EXECUTIVE SUMMARY

Wireless Training & Solutions, or (WiTS) will perform a complete WLAN site survey assessment. The services consist of the following: On-site survey, spectrum analysis, and detail design reports for Lawrence Public Schools. WiTS will coordinate the project, testing and analysis required to assess the wireless network. This assessment is conducted based on field proven testing auditing techniques and will provide the IT and related staff with a detailed overview of the wireless connectivity solution.

SCOPE OF WORK

This project consists of the following elements:

1. The RF survey utilizing AirMagnet Surveyor® - Provides Data Rate and Signal Strength, which will be, displayed on a heat map in the final report deliverable at the following values
    a. -65 dBm on 2.4 GHz and 5 GHz
2. The WiTS engineer will perform a passive survey covering both the 2.4 GHz and 5 GHz.
3. The WiTS engineer will perform an active survey covering 5 GHz.
4. WiTS will provide a standard graphical representation, by floor and by 802.11 bands, illustrating standard survey parameters as appropriate, including Access Point coverage mapping, signal strength, channel interference and a list of detected rogue devices and a characterization of WLAN performance by building floor.
5. Spectrum Analysis utilizing Spectrum XT® - Capture Spectrum Data in 2.4 and 5 GHz. Result data will be displayed in final report deliverable.

Analysis of all aspects of the wireless environment is critical in helping to more accurately identify the root cause of the problem. Failure to identify root causes of a problem will result in unreliability or poor performance of the network. Inaccurate analysis may result in the appearance that a problem is resolved but, in fact, has not or other problems may then occur. Readings will be taken throughout the facility in areas that have been deemed in-scope. Areas that are In-scope are identified during the pre-deployment workshop and will be identified.

PROJECT APPROACH

Engineers will be dispatched to each site to inspect the wireless environment.

A physical assessment of the site will be performed to identify issues related to the mounting and/or antenna placement. Any items that are of concern to the onsite engineer will be documented. This includes machines that may be operating in an interfering range and/or equipment noted on the wireless scans that may be critical to the function of the facility but present a significant source of interference. Issues related to critical functions operating in the same frequency range will need to be addressed between all involved parties. As this instance cannot be captured prior to performing the assessment, mitigation of these issues would be addressed in a separate scope.

This is a thorough and detailed process and the primary goal is to educate those who support the wireless environment on what is currently taking place from the view of the wireless clients. This understanding and subsequent mitigation steps are critical to stabilizing the wireless environment. It is not possible to correct the problems in the wireless environment without first understanding what they are. This knowledge allows for strategic and accurate modifications to the environment to allow for proper transfer of data with the least likelihood for data corruption in the air.

PLANNING SESSIONS

A planning session meeting will be organized for each of the locations. In this meeting, we will minimally discuss the following:

1. Review preliminary design requirements with the designated contacts and confirm they meet customer's objectives and goals for the Wireless LAN Site Survey.
2. Review the project schedule with the designated Engineering and Implementation contacts.
3. Confirm onsite contact information and physical site access.
4. Review the protocol for propagation testing.
5. Identify areas in scope for coverage that have AP mounting restrictions. These areas will need special design consideration.
6. Areas generally in scope, with mounting restrictions:
    a. Stairwells
    b. Elevators
7. Identify and confirm in scope and out of scope areas for design. Areas generally Out of scope:
    a. Electrical Rooms
    b. Mechanical Rooms
    c. Air Shafts
8. Review floor plans and bring attention to customer Network Implementation Specialist and Network Engineer contacts any potential trouble. Exhibits and drawings will be used to document possible interference-causing sources and issues.

SUMMARY OF DELIVERABLES

Engineers will access all Customer areas considered "in-scope" as defined in the Planning Session. These areas will need to be available for WITS personnel conducting the survey for approximately 8 – 10 hours per day. Multiple return trips to the same location due to inaccessibility may affect the cost of the project.

It is assumed that with proper planning and coordination the survey will not be delayed. However, if there are delays affecting the survey team, team will return to the site to complete the work during a subsequent billable visit. All collected data and photos can be taken offsite to finalize documentation. No cabling will be performed.

1. Onsite Site Survey for Lawrence Public Schools.
    a. Customer estimates less than 2,000,000 sq. ft. in total to be surveyed at this location. The survey will include the 22 locations below.
    b. Spectrum Analysis utilizing Spectrum XT® - Capture Spectrum Data in 2.4 GHz and 5 GHz will be run throughout the survey areas. Only the trouble areas will be shown on the final report.
2. Detailed Site Survey Report, within 10 business days of survey completion of the building(s) listed, will be presented and provided to the customer. The report will include the following:
    a. Key Findings & Site Recommendations with Wireless LAN best practices
    b. Updated wireless LAN design and configurations
    c. AP channeling map
    d. AP power recommendations
    e. Antenna specification (if needed)
    f. AP Placement and location photos (if requested)
    g. Wireless LAN controller recommended modifications.
    h. Heat-maps per floor to include:
        i. Area Meeting Minimum -65dBm RSSI
        ii. SNR
        iii. Floor Noise
    i. Spectrum Analysis:
        i. Spectrum Analysis of trouble areas
        ii. Spectrum interference findings and site recommendations

Location	Address		SQ FT
Broken Arrow	2704 Lousiana St	Lawrence, KC	40,395
Cordley	1837 Vermont	Lawrence, KC	65,670
Deerfield	101 Lawrence Ave	Lawrence, KC	60,100
Free State	4700 Overland Dr	Lawrence, KC	264,049
Hillcrest	1045 Hilltop Dr	Lawrence, KC	56,000
Kennedy	1605 Davis Rd	Lawrence, KC	69,909
Langston Hughes	1101 George Williams Way	Lawrence, KC	62,983
LC&CC	2910 Haskell	Lawrence, KC	33,606
LHS	1901 Louisiana	Lawrence, KC	285,772
LHS - Annex	1901 Louisiana	Lawrence, KC	18,760
LMCMS	1400 Massachusetts	Lawrence, KC	129,385
New York	936 New York	Lawrence, KC	43,608
Pinckney	810 West 6th	Lawrence, KC	54,000
Prairie Park	2711 Kensington	Lawrence, KC	56,214
Quail Run	1130 Inverness Dr	Lawrence, KC	53,577
Schwegler	2201 Ousdahl	Lawrence, KC	49,579
South	2734 Louisiana	Lawrence, KC	114,469
Southwest	2511 Inverness Dr	Lawrence, KC	131,531
Sunflower	2521 Inverness Dr	Lawrence, KC	56,783
Sunset Hill	901 Schwarz Rd	Lawrence, KC	50,191
West	2700 Harvard Rd	Lawrence, KC	122,409
Woodlawn	508 Elm	Lawrence, KC	34,292
		Total	**1,853,282**

CUSTOMER RESPONSIBILITIES AND ASSUMPTIONS

- Provide maps with known problem areas noted on the floor plan.
- Coordinate Safety Training as needed.
- Provide escort with appropriate technical knowledge of system to assist each engineer as required.
- Passive Survey is for both 2.4 GHz and 5 GHz
- Active Survey is for 5 GHz
- Provide accurate drawings of facility appropriate for use by engineers and with survey software.
- Provide data on existing infrastructure (device settings, equipment capabilities, etc.) as requested.
- Provide floor plan showing existing Access Points (AP's) location and name of each AP.
- Provide all required authorization to take pictures in the facility. (IF REQUESTED)
- Notify all staff on status of survey team.
- Site will provide access to the wireless controller with IT representative present during evaluation. Engineering team will collect specific data on the controller for inclusion in the final report. Recommendations may require changes to the controller.
- Engineers will access all areas that are considered "in-scope", these areas will need to be scheduled for availability during survey with access of 8 – 10 straight hours for 5 straight days.
- Access is available at the time the survey crew is performing the analysis. Multiple return trips to the same location due to inaccessibility may affect the cost of the project.
- Changes to the scope as a result of the pre-deployment scope workshop may affect the onsite engineering fee.
- It is assumed that with proper planning and coordination with onsite staff and operations personnel that the survey will not be delayed. However, if there are delays that affect the survey team beyond what has been budgeted, the survey team shall return to the site to complete the work during a subsequent billable visit.
- All collected data and photos can be taken offsite to finalize documentation.

PRIMARY CONTACTS

WITS Contact	Scott Williams	Primary Customer Contact	Jennifer Fessenden
Title	Managing Partner	Company	Lawrence Public Schools
Phone	(404) 963-0144	Phone	(785) 330-2201
Email	scott@wirelesstrainingsolutions.com	Email	jfessend@usd497.org

Wireless Training & Solutions LLC
7800 Miller Drive, Unit B, Frederick CO 80504-3449
http://www.wirelesstrainingsolutions.com - (404)963-0144

PROFESSIONAL SERVICES TERMS, FEES AND PAYMENT

- In the event of any inconsistency between the Agreement and this Statement of Work, this Statement of Work shall control.
- Customer's Purchase Order for the Services is due prior to commencement of Services.
- Services will be scheduled at the Planning Session.
- Rates are based on travel arrangements made with 3 – 4 week lead time; late scheduling and/or changes may increase travel rates.
- Prices valid for 30 days from date of quote, below.
- The parties will agree in writing to any changes in the Scope of Work or Deliverables as described above; changes may increase rates set forth below.

Quote No: 101220 - 12/9/2015 Lawrence Public Schools		
Description	**Quantity**	**Total**
Priority Site Survey & Design Reports	**22**	**$ 78,785.00**
Secondary Site Survey and Design Reports		
WiFi Audit & Remediation Reports		
T&E Included		
	TOTAL:	**$78,785.00**
	50% Deposit:	**$39,392.50**
	Balance Due	**$39,392.50**

CUSTOMER AUTHORIZATION

Agreed to and accepted by:

Lawrence Public Schools

_____
Authorized Signature

_____
Printed Name

_____
Title

_____
Date

WIRELESS TRAININGS & SOLUTIONS

_____
Authorized Signature

_____
Printed Name

_____
Title

_____
Date

CHANGE REQUEST FORM

Created by Scott Williams

Version 1.0 – Issued 10 December 2015

Project:	
This document has been issued by: [Person Issuing Document]	Date Issued:

The following change request has been formally accepted on behalf of the customer.

Detailed Change Request:
Value of Change Request and additional Milestone:

Customer: Signature: _____

Name: _____

Date: _____