10.4.6 Wireless Site Survey Facts

As you conduct your site survey, keep the following in mind:

Consideration	Description
Site Survey Test Equipment	You should bring access points to each location to test the signal quality and to identify the node density required in each area. Your site survey kit should include: ▪ Two access points. ▪ Two laptops with a network performance measurement utility, such as Iperf, installed so you can evaluate the network throughput available at each location. ▪ Two laptops with a network performance measurement utility, such as Iperf, installed so you can evaluate the network throughput available at each location. ▪ A tall ladder so you can test each AP at height or close to height. During the site survey, you will not physically install each access point. Instead, you will use a ladder to approximate the AP's final mounting location for testing. In outdoor deployments, you may need to use a bucket truck instead of a ladder to complete this task. ▪ Two-way radios to communicate with your assistants. ▪ A spectrum analyzer.
Testing Procedure	The site survey test procedure involves the following tasks: ▪ Mount ▪ Align ▪ Test ▪ Move ▪ Test ▪ Perform a spectrum analysis While testing, you should measure goodput. *Goodput* refers to the number of useful bits delivered from the sender to the receiver over the wireless network connection. Errors due to lost, corrupt, or dropped packets require retransmission and reduce the goodput of the connection. Part of your testing is to measure goodput.
Spectrum Analysis and Channel Plan	During the survey, you should use a spectrum analyzer at different times of day to check channel utilization and to identify sources of RF inference at each location where you plan to deploy an access point. You can use freeware tools such as NetStumbler or Kismet to create a snapshot of wireless spectrum usage by nearby home and business networks, along with their proximity to your network. When you perform your spectrum analysis, you should record the number of other APs in the area and the channel utilization in the 2.4 and 5.x GHz bands to aid in channel planning. When you run your spectrum analysis, you should gather data at the heights where the AP will be installed and user devices will be located. A spectrum analyzer can determine the noise floor in the desired frequency range, allowing you to select the best available wireless channel. To determine the noise floor, identify the: ▪ Received signal level (RSL), which identifies how strong the radio signal is at the receiver. The closer you are to the transmitter, the stronger the RSL. The farther away you are, the lower the RSL. ▪ Signal to noise ratio (SNR), which compares the level of the wireless network signal (RSL) to the level of background noise (measured in decibels). ▪ The number of other APs in the area. ▪ Channel utilization in the 2.4 and 5.x GHz bands to aid in channel planning. When running your spectrum analysis, you should gather data at the height where: ▪ The AP will be installed. ▪ User devices will be located.

	A spectrum analyzer can determine the noise floor in the desired frequency range, allowing you to select the best available wireless channel. To do this, identify the: ▪ Received Signal Level (RSL), which identifies how strong the radio signal is at the receiver. The closer you are to the transmitter, the stronger the RSL. The farther away you are, the lower the RSL. ▪ Signal to Noise Ratio (SNR), which compares the level of the wireless network signal (RSL) to the level of background noise (measured in decibels). An SNR higher than 1:1 indicates more signal than noise, which is desirable. The farther a receiver is from a transmitter, the lower the RSL and the SNR. If the RSL falls below the noise floor, connectivity is lost. Using the spectrum analyzer data, develop a channel plan that will work in your environment. Be sure to identify all of the frequencies that will be used.
Core Network Planning	Plan out the core network. You should identify the IP addressing scheme and the VLAN configuration. Avoid a VLAN configuration that has a large number of wireless clients in the same VLAN because it will likely result in an excessive amount of broadcast traffic. To remedy this situation, you can: ▪ Create multiple, smaller VLANs. This will reduce broadcast traffic, but it will also require additional routers to route traffic between VLANs. ▪ Implement VLAN pooling. In this configuration, each wireless client is randomly assigned a VLAN from a pool of VLANs on the same SSID. This strategy automatically partitions a single broadcast domain into multiple VLANs. Use this information to create a logical network diagram that can be used during the actual deployment of the wireless network.
Equipment List	Using the network diagram you have created, identify the equipment you need: ▪ How many wireless controllers are necessary. ▪ How many access points are necessary. ▪ What media needs to be implemented. Use this information to generate an equipment list. If you think spare devices will be required, account for them in the list.
Site Survey Report	After the site survey is completed, you should create a site survey report containing: ▪ A physical network diagram, including each access point, controller, and the media that connects them. ▪ An RF model that includes a frequency/channel plan. ▪ The spectrum analysis results. ▪ A logical network diagram containing SSIDs, IP addressing, and VLAN information. ▪ Photographs and diagrams of each access point mounting site. ▪ A list of structural modifications required to build the network. ▪ A list of alternate mounting locations (if necessary). ▪ A list of equipment that must be purchased. ▪ A cost estimate for equipment and labor.