Community Learning Center Schools
Wireless Survey Results

Overview

CLCS moved to 1900 3rd St over the summer, taking over a suite of buildings and portable units previously managed through Alameda Unified School District's wireless. AUSD has removed all of their equipment, and CLCS will be implementing new wireless infrastructure. The new campus combines three different campuses and two unique wireless configurations. Due to the flexibility of Meraki, CLCS is moving forward with a project to implement a full Meraki configuration throughout the entire campus.

Wireless performance is critical in every classroom as all facilitators use laptops for instruction. In addition, there are several laptop and Chromebook carts in use for both ACLC and Nea. It's anticipated that Chromebooks and other portables will be a focus for future educational instruction as well.
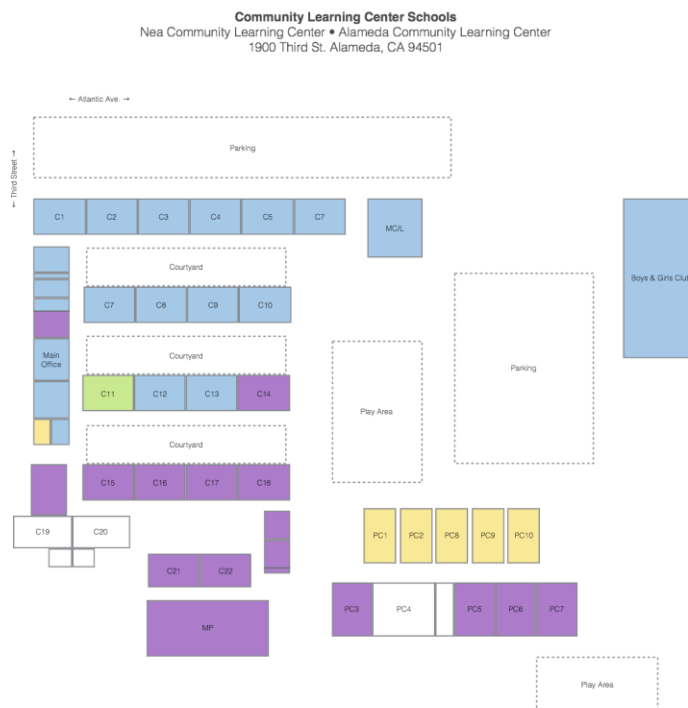

Figure 1: CLCS Proposed Floor Layout

Figure 1 shows the proposed layout for 1900 3rd St. Our wireless survey focused on providing wireless coverage for all interior areas shown on the map, excepting C19 and C20 which are currently in use for a day care program and bathrooms.
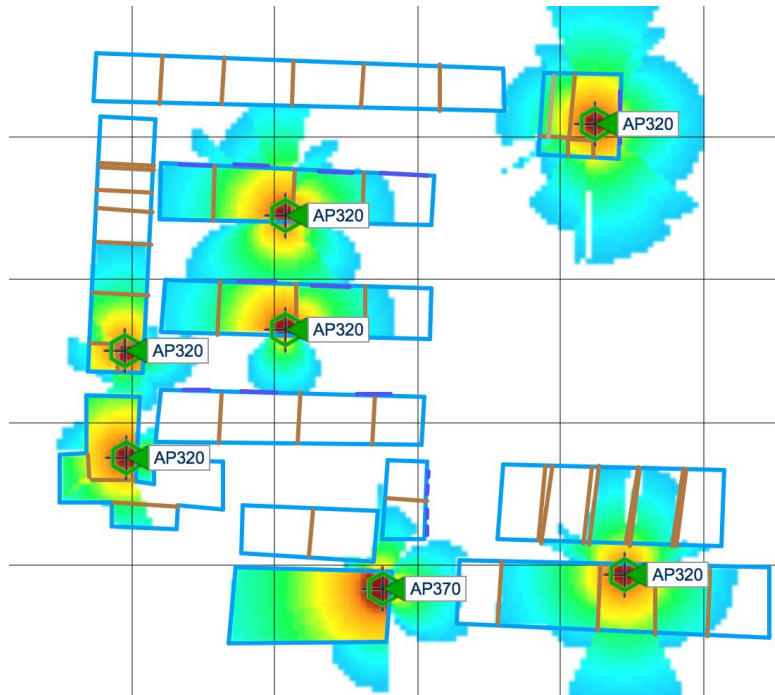
Survey Results

Figure 2: Approximate signal strength for current access points (Aerohive planning tool)

Figure 2 shows the approximate signal strength and coverage of the current access points that were moved from the ACLC campus. Please note: One access point has been dedicated to the CLCS offices and is not shown on this map.

Building Materials

I focused the survey on studying the interference presented by the current building materials in question using the 5GHz wireless band. The 5GHz band is preferable for high density deployments. Classrooms would be considered high density since there is a possibility that several laptop carts could be in use in adjacent or nearby rooms, and there will still be a need to provide access for facilitator laptops and any devices facilitators, learners, and guests may bring on campus that would become associated to an available network.

There is a lot of signal loss in many of the buildings. For 2013 – 2014 ACLC's campus was located among several portable units. The construction materials within the portable units contribute far less to signal degradation. The walls at 1900 3rd Street are composed mainly of cinder block, and our access points in place within those rooms show a marked drop in signal on the other end.

Most of the windows on campus are facing the north and west side of the rooms. Windows will allow for a stronger wireless signal, but since most of the windows face away from the campus, this doesn't help concentrate any of the coverage in other classrooms. The rooms with windows facing other buildings (C7-C19, C21-C22) have courtyards on the window side. While this means those courtyards should have good coverage, it doesn't help concentrate wireless coverage in neighboring buildings.

Competing Signals

Although parts of campus are close to residential homes, there are few areas where there is a strong competing signal. Additionally, AUSD has removed almost all of their equipment. Boys and Girls Club has a few wireless networks, but their signals are not strong enough to affect any of the Nea or ACLC buildings. With the lack of signal competition it should be easier to tune the wireless network for performance in the future.

Recommendations

The Meraki wireless system allows for a great deal of flexibility with placement of the current access points. AUSD left their wireless cabling infrastructure, and it should be possible to utilize most of that wiring to place the additional Meraki access points necessary for full coverage. I am recommending MR26 access points as they are well suited to high density environments.
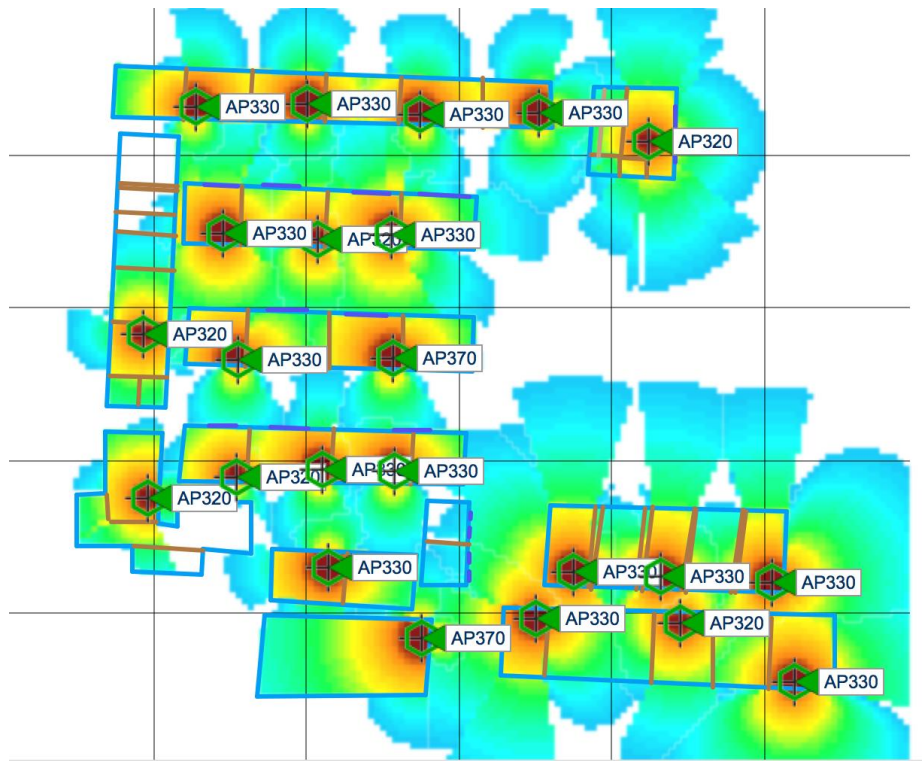

Figure 3: Proposed Wireless Plan

Figure 3 shows the proposed wireless plan. This would involve the addition of 16 new access points throughout the campus.

Wireless Access Point Setup

Estimated Equipment Costs:

Qty	Product	Description	Unit Price	Price
16	Meraki MR26	Cloud Managed Access Point	$1099	**$17584**
16	Enterprise Management License	3 year term	$300	**$4800**
16	Meraki PoE Injector		$149	**$2384**
EQUIPMENT ESTIMATES				$24768
EQUIPMENT ESTIMATES (including estimated tax, fees, and shipping)				$26997

Tasks	Low estimate	High estimate
Unpack Access Points	1	2
Add access points to Meraki Console	.25	.5
Install PoE Injectors and Patch Access points into Current Network	4	8
Mount Access Points	5.5	11
Update Access Points with specific SSID settings	1	2
Total time estimates for project	**11.75**	**23.5**