Wi-Fi Improvement Funding - Current & Proposed

Current Funding

Towards the end of 2015, we saw 65,000+ unique devices a day on the campus WiFi network, with a peak concurrent user count of 27,873. The traffic levels for the entire network were 13.7 TB per day. (For perspective, a 2000 study by iSchool professors Peter Lyman and Hal Varian estimated that 10 terabytes is the size of the Library of Congress print collections.). By the middle of 2017 (18 months later) we saw 85,000+ unique wireless devices per day (a 30% increase), with a peak in excess of 35,000 simultaneous users (a 26% increase). The traffic level for the entire network grew to 44TB/day (a three-fold increase).

In each of FY18 and 19, IST received $944K to partially fund a proposed plan to provide modernized Wi-Fi to about 60% of campus. Wi-Fi has continued to grow in importance in the campus environment, and the inadequacies of the existing Wi-Fi service have become even clearer in the time since the initial proposal was made. Reports from instructors and students of poor Wi-Fi connectivity hampering classroom activities are widespread. Wi-Fi network degradation and failures when they occur heavily impact teaching and learning.

The majority of existing campus Wi-Fi equipment has reached the end of its supportable lifetime and is now obsolete. Implementation of high quality 802.11ac Wi-Fi service requires a complete redesign of the Wi-Fi infrastructure in each location. Simply swapping out older equipment for newer equipment will not provide good coverage.

In the original redesign proposal, the *estimated* cost was $787 per new installed access point. Changes in campus policies regarding contractors and in vendor costs have resulted in an *actual* cost of $1040 per access point. With a funding level of $944K/year, because of existing equipment obsolescence IST will be constrained to doing only in-place replacements of aged equipment with newer equipment. While in-place replacements are less costly at $593 per access point, and prioritizing replacements-only will lead to the campus having new Wi-Fi equipment, it will also result in a majority of campus with poor coverage.

In early 2019 we are seeing 138,000+ unique wireless devices per day (a 62% increase), with 46 TB/day on Wi-Fi alone. With 2 years of Wi-Fi improvement project now complete, wireless access points have increased from 4500 to 5900 (a 31% increase), with improvements having been targeted at the highest traffic locations and new construction. 30% of campus Wi-Fi has been redesigned and is now optimal, but 70% is obsolete and requires replacing. Data from the improved network shows that 90% or more of users are connecting at peak speeds in those areas.

With funding continued at levels consistent with the past 2 years, the campus will reach 40% of good 802.11ac coverage this fiscal year, but will only make minor incremental improvements in following years as the remaining funds will be utilized to refresh hardware as it ages. (see below chart).

Current Funding

$ in '000s										
FY18	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
$944	$944	$944	$944	$944	$944	$944	$944	$944	$944	$944

Impacts of Discontinued Funding

Funding for Wi-Fi improvements on campus was only approved for FY18 and 19. If this funding does not continue in FY20 and beyond, IST will be unable to replace significant amounts of obsolete equipment which will gradually begin to fail, leading to a broad degradation of campus Wi-Fi coverage.

Funding Discontinued

Legend: ■ No Coverage ■ Good New ■ Obsolete ■ Poor New
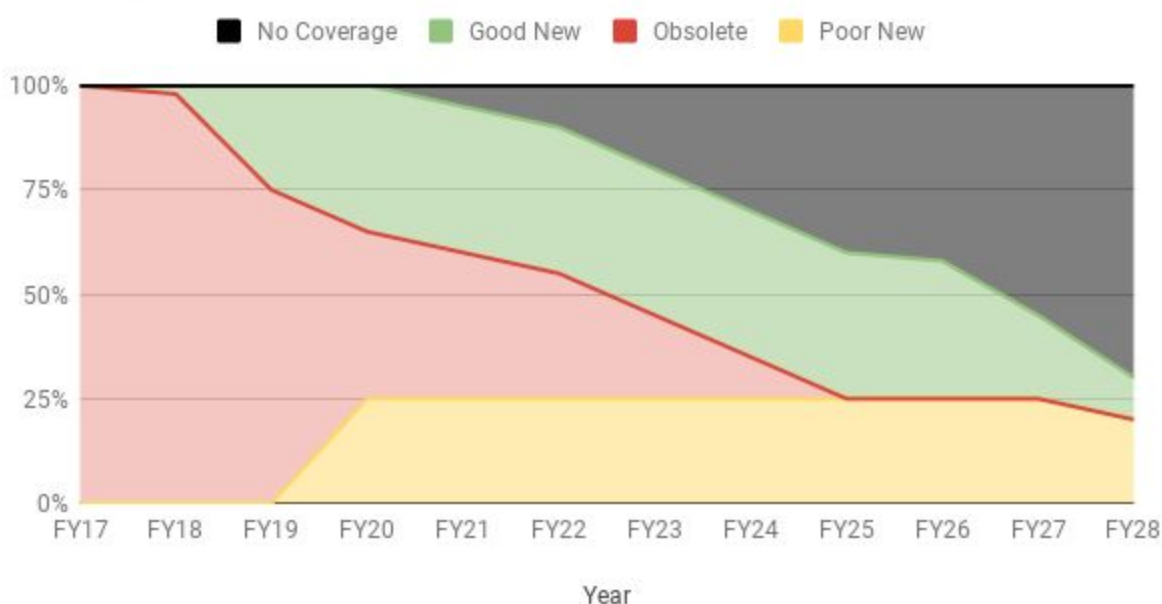
$ in '000s										
FY18	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
$944	$944	$0	$0	$0	$0	$0	$0	$0	$0	$0

Neither of the two above scenarios produces an acceptable outcome for students, faculty, and administrative staff who depend on Wi-Fi to complete their assignments, provide instruction, and get work done . Continued funding at FY18/19 level fails to provide a majority of campus with Wi-Fi service capable of supporting a modern teaching, learning and research environment. Discontinued funding will result in increasing degradation of Wi-Fi performance and coverage going forward.

Proposed Funding

With an increased level of project funding, IST would move from an expected 40% good 802.11ac coverage level to 80%. This would result in the majority of all teaching and research spaces having 'good new' coverage.

Supportable Model

Legend: Good New | Obsolete | Poor New

$ in '000s										
FY18	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**
$944	$944	$1,637	$1,637	$1,637	$1,637	$1,000	$1,000	$1,000	$1,000	$1,000

With this proposal, IST would continue to install redesigned high quality 802.11ac coverage, while also swapping out obsolete equipment to maintain Wi-Fi stability, then redesigning coverage in areas where this obsolete equipment had been replaced. 80% of 'good new' campus coverage would be achieved in FY22/23.

This proposal would result in 9400 Wi-Fi access points being installed, an increase of 4900 (more than double) over the approximately 4500 access points which covered campus when the improvement project began. The proposed funding would cover ongoing refresh of hardware as it ages (with a replacement life cycle of approximately 6 years).