3D Mapping System Helps Engineering Firm Efficiently Install IBW in Seattle Schools

Engineers responsible for designing and installing In Building Wireless (IBW) networks have longed for tools to help them do their jobs better and more efficiently. For one engineering firm in the Pacific Northwest, utilizing the Anritsu *LMR Master™ S412E* handheld analyzer with the *MA8100A TRX NEON Signal Mapper* provided them with considerable advantages over traditional signal mapping methods that require a GPS signal, which is usually unreliable – at best – or more commonly unavailable indoors. By using this innovative system, the engineering team was able to complete the project faster so schools could open on schedule.

Signal Mapping New Schools

A professional engineering company in Seattle was contracted by the Seattle School District to create signal maps for two new school campuses to ensure there were no coverage holes. The district would not receive Certificates of Occupancy (CO) for the educational facilities without having the maps documented. If traditional signal mapping methods were used, the process would be incredibly long and arduous, as the two sites consisted of 12 buildings. Fortunately, the process took a fraction of the usual time because of the new solution.

The engineers working on this project utilized Anritsu's signal mapping system, in addition to data obtained from traditional systems. Using the solution developed by Anritsu and TRX Systems, the engineers wore a tracking unit on their belt connected via Bluetooth to an Android mobile device to record location data without GPS. The system leverages a cloud service, which allows the engineers to generate 3D geo-referenced coverage maps and monitor the mapping process in real time without leaving the site.

Preparing a Map

Simplicity is another benefit of the system. To begin preparing a map, the floor plan for each of the 12 buildings was converted into a graphics format with a grid layout superimposed on each image. The address of the construction site was then entered into the NEON Command Software. The buildings to be mapped were located on the PC screen (Figure 1). Engineers then used the NEON Command Software to generate the 3D building outline and load the floorplans.

Figure 1: The TRX NEON Command Software was used to place a floor plan onto the PC

After preparing the map, the engineers placed an Anritsu S412E on a cart and connected the analyzer to a quarter wavelength measurement antenna that was between three and four feet above the floor level and an equal distance from the operator. To transfer measurements to the NEON software, the Android mobile device was connected to the S412E via a USB OTG cable. Running the NEON application on the Android device made the maps and measurement results viewable to the engineers in real time. The Neon Tracking Unit connects to the Android device via Bluetooth to provide location information on the map (Figure 2).

Figure 2: Observing the location and measurement results on an Android phone in a classroom

3D Models

After a short calibration process, the engineers were ready to map signals and conduct measurements. The operators walked their specific path, observing their location on the Android device. After completing their trek, they uploaded the measurement results with location information to the NEON cloud storage service, which allowed remote managers to view the maps in 2D or 3D models (Figure 3) or as comma-separated files with results for each measurement. The NEON software provided a heat map display based on an average of measurements to predict coverage around the walking path.

Figure 3: Using the NEON Command Software to view the signal strength inside three levels of the school

Saving Time and Money

Using the NEON Signal Mapper and traditional methods, the engineers assigned to the project were able to generate complete signal maps for all 12 buildings in less than three days. Without the NEON Signal Mapper, this job would have taken up to two weeks with traditional methods. The valuable reports were vital to the schools receiving their COs. The solution's highly efficient report generation reaped benefits for all involved. The team from the engineering company could move on to a new project sooner, for more efficient operations, while the school district enjoyed financial benefits from the shorter time required to complete the assignment.

Along with saving time and money, the Anritsu system provided the engineers and the school district with vital information that can be used by public safety officials. The comprehensive data acquired is paramount, as it helps ensure the safety of the students and faculty in the school. When dealing with something so important, it is crucial to ensure that every test is conducted successfully.

For more information on this specific case and signal mapping using the MA8100A TRX NEON Signal Mapper and the LMR Master™ S412E please visit our website at *www.anritsu.com*.
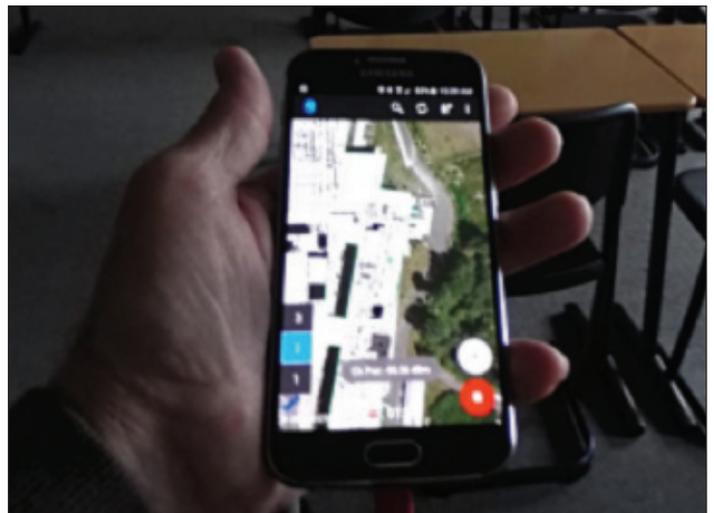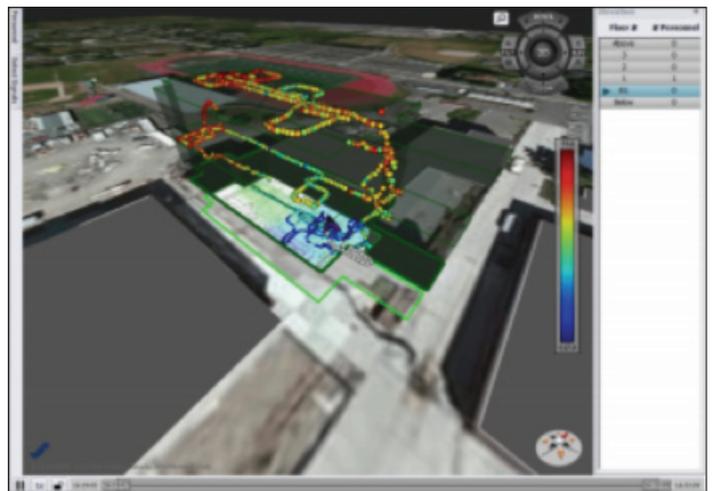
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