

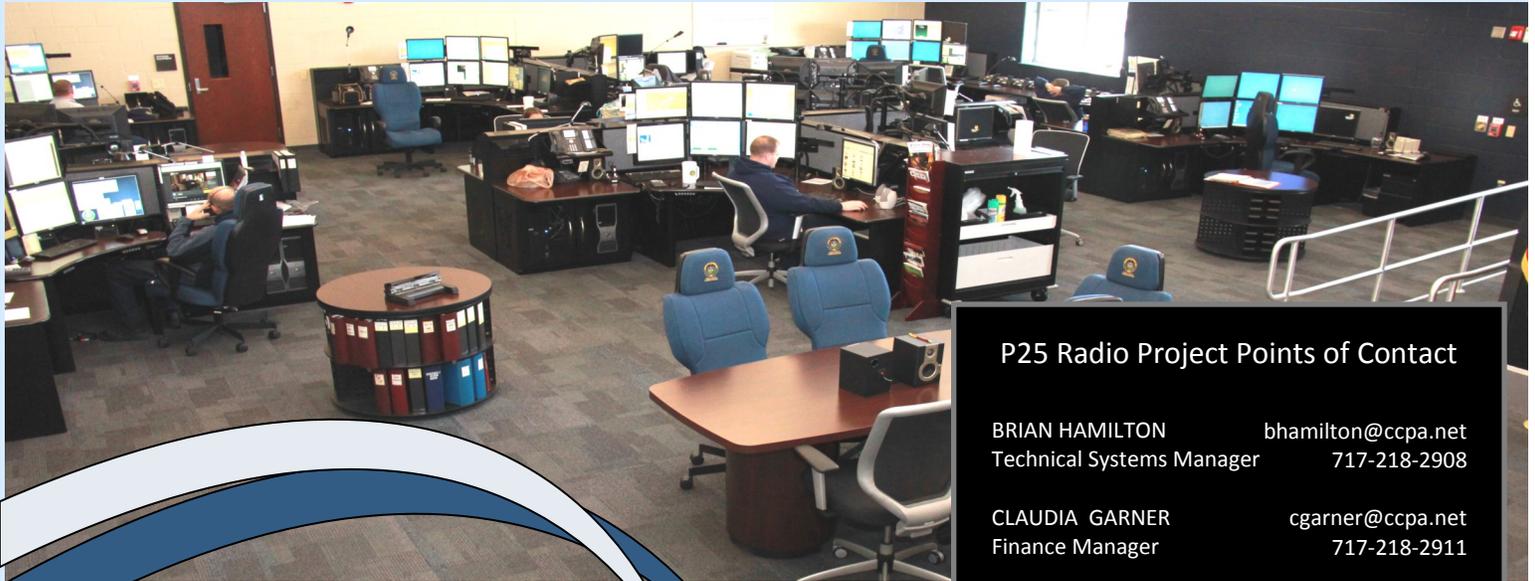
P25 WAVES

A COMPREHENSIVE PROGRESS REPORT OF OUR FUTURE RADIO SYSTEM



Cumberland County Department of Public Safety

Updated: 05-11-2018



P25 Radio Project Points of Contact

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CONCEPT FOR A NEW P25 RADIO SYSTEM

As technology continues to enhance even the simplest of systems, the Cumberland County Department of Public Safety (DPS) radio system that was purchased in August 2000 is no exception. Project 25 (P25) is the national standard that was developed that allows for improved interoperable solutions for the end-user. While the existing stand-alone radio system is functioning and handling today's needs, we recognize the interoperability challenges inherent to a proprietary radio system. Original model radios are either at or past their end-of-life date. While newer models are available and being purchased, users need the assurance they are making wise investment choices. In April 2016, our team shared this information and the Cumberland County Board of Commissioners who agreed that long range planning is important to both avoid mission critical failure and ensure the ability to take advantage of procurement & financial opportunities.

P25 solutions have been successfully implemented across the country, so our team reached out to some of the Public Safety Answering Points (PSAPs) both near and far for their feedback. Each of the PSAPs expressed three identical success points: design a system that provides the radio coverage that emergency responders can rely upon, involve the end-users from the beginning, and invest in a consultant who can coordinate an impartial recommendation. Following recommendations, our next step was to share the concept with the Municipal Advisory Board, the Chiefs of Police, Fire and EMS, and issue a Request for Quotes for just the vendor recommendation piece of the project only.

TIMELINE:

April 2016: Presented P25 concept to Board of Commissioners

May-June 2016: Field visits to four PSAPs for lessons learned in their transitions

June 2016: Presented P25 concept to Municipal Advisory Board

August 2016: Presented P25 concept to Chiefs of Police, Fire & EMS

Issued Requests for Quotes from four consulting firms

October 2016: Received and reviewed four consulting proposals

Management Team & Chief Clerk independently reviewed & rated proposals, collectively top two consultants selected for second review process

Consultant presentations before the Board of Commissioners, Chief Clerk and DPS Management Team

Survey sent to previous customers of top two firms for feedback

PROJECT GOALS:

The County's goals throughout the radio project are to:

1. Through appropriately broad stakeholder input and thorough research, design the best possible radio system to meet the coverage needs of the County's first responders within Cumberland and surrounding environs.
2. Work collaboratively and transparently with our public safety partners in all aspects of the Project, through an advisory board and other multi-directional channels, to ensure input from all stakeholders .
3. Weigh the financial impact of decisions about network and equipment on all stakeholders, proceeding in a fiscally responsible manner.

CONSULTANT SELECTION

12-14-2016

In October 2016, DPS Management Team received and independently reviewed each of the proposals based on the following criteria: P25 implementation experience with all major vendors; project management style; years in business; and pricing. Based on the aggregate scoring, the top two vendors were invited to present their proposal before the Board of Commissioners, Chief Clerk and DPS Management Team. Once again, our team independently reviewed and scored the vendors based on: methods to involve stakeholders; development of specifications; evaluation of proposals; cost containment and more. Next we sent a survey to four previous customers of both vendors, two that were listed on their proposal and two that were not. Their customers were asked to score the vendors, as well as provide any additional feedback that may be useful in our decision. After compiling all the independent scores both from our staff and the previous customers, the DPS Management Team made a recommendation to the Board of Commissioners to enter into agreement with SSC Consulting LLC for this piece of our project. The contract was approved in December 2016 and the project kicked off with the initial phase of outreach surveys and information sharing meetings with our public safety partners.

PUBLIC SAFETY PARTNER OUTREACH MEETINGS

03-07-2017

While we know it is important for the infrastructure to work, we also know involving our public safety partners from the beginning is equally important. All of our public safety partners and municipal officials were invited to attend one of four information sharing sessions held across the county. At each of the sessions, SSC Consulting provided an overview of the importance of specificity in the information obtained from the outreach survey and how it would be used. Perhaps you will find some of the frequently asked questions and answers shared at the meetings helpful.

Q: What is a P25 system and how is it different than what we have now?

P25 is a common interface standard that was developed by APCO in response to end user agencies wanting seamless interoperability and to provide true competitive pricing for end user



Timeline

November 2016: DPS Management Team made recommendation to engage in an agreement with SSC Consulting LLC

December 2016: Board of Commissioners approve & execute consulting agreement with SSC Consulting LLC for vendor selection process

January 2017: P25 Consulting Project Kickoff Meeting

February 2017: Developed data tool

OUTREACH MEETINGS

March 6, 2017:

Cumberland County DPS

Attendance: 34

March 7, 2017:

Shippensburg Firefighters

Activities Center

Attendance: 10

March 9, 2017:

Carlisle Fire & Rescue

Attendance: 12

March 13, 2017:

Hampden Township Fire

Attendance: 12

FREQUENTLY ASKED QUESTIONS (FAQ's)

equipment (mobile and portable radios), since multiple manufacturer's radios can be used on any P25 system. The differences between OpenSky and P25 are several, but most are in relationship to system management and design. The end user capabilities are similar in nature to P25 and for the most part, end user's capabilities can be mirrored from one system to another. After a system vendor is selected, there will be end user education to develop operational plans and programming for radios, to ensure the end user communities needs are met.

Q: *What is the status of the current system and how urgent is the need to convert to P25?*

The County's OpenSky technology is not at end of life and there is no urgency to replace the technology. However, with the Commonwealth and several surrounding jurisdictions switching to P25 technology, as well as the possibility for Cumberland County to apply for new frequencies, it is prudent to begin the process of new system development early. Likewise, during the outreach meetings, the end user community was very vocal about the need to enhance system coverage and the advanced planning necessary to replace their end user equipment.

Q: *Coverage is critical. How will coverage testing be performed?*

Coverage testing of P25 systems is completed using the TIA TSB-88 standards for communication systems. These are nationally recognized, statistically proven testing methods that will guarantee radio system coverage. Outside coverage testing is performed by laying out the county in grids and using receivers and software to collect signal strength and bit error rates for the system by passing through each accessible grid. Likewise, these same grids can be used to perform a Delivered Audio Quality (DAQ) test, which involves making manual test calls to and from a dispatch console and grading the quality of each call. The size of the grids will be coordinated and decided upon by the County at the appropriate time. Each grid will be tested and scored, then will be given a pass or fail. In building coverage testing will also be collected using a pre-selected list of critical buildings identified by end user agencies. In building testing is completed by gridding the different floors of the individual buildings and completing test calls to and from a dispatch console, to ensure contractual coverage is achieved. These tests will be conducted with a Radio Project Advisory Board consisting of Municipal leaders, representatives from Police, Fire and EMS along with the selected vendor. As a point of reference, our current system was built on the standard of 95% coverage for a portable-on-hip on the street. Additionally, it was also designed with a -12 dB portable in-building coverage standard for residential structures (ground level or above).

Q: *Will it be possible to utilize more than one brand of radio on whichever brand of infrastructure is chosen?*

Yes, it will be possible for multiple manufacturer's radios to operate on a single P25 system, regardless of the manufacturer. However, it will be important that we all evaluate the pro's and con's of having multiple vendors' radios operating on the system. Specific functions of encryption, over-the-air-programming and managing programming of multiple vendors' radios that use different programming software can be a challenge.

Q: *Will we be able to talk to neighboring counties with a P25 system?*

Yes, neighboring counties, state and local agencies using the same frequency range as Cumberland County (700/800 MHz), will have the ability to easily 'roam' to each other's radio systems, providing the best coverage for interoperability. This will need to be taken in to account once a vendor is named so that proper infrastructure equipment is put in place. Interoperability with counties on different frequency ranges are possible, just not as seamless. In this scenario, agencies will need a radio that will operate on multiple frequency ranges, commonly called multi-band radios. The user would then need to switch to that respective system to be able to communicate once inside of their coverage areas.

Q: *Will the radios work point-to-point?*

Yes, the radios are able to be programmed with multiple "trunked P25 systems" as well as "conventional radio to radio channels" within the radio's frequency band capabilities. This would include the national interop channels and can also be programmed as analog, P25 digital and encrypted (encrypted requires the feature be purchased as well.)



Attendees:

Cam Baer (EMS 91)
Corby Sloan (EMS 91)
Bradley Stouffer (FD 47)
Troy Wiser (FD 47)
Larry Seagrist (Fire Chief 8)
Todd Bashore (PD 16)
Mark Green (PD 16)
Jim Adams (PD 23)
Earl Reitz (CC Prison)
Travis Shenk (CC Prison)
Ron Hamilton (Chief 2)
William Coulson (South
Middleton Twp)
Mike Taylor (Team 200)
Nathan Harig (EMS 40)
Todd Moul (CC DRO)
Bill Grace (CC DRO)
Bill Cook (EMS 71)
Phil Beck (EMS 75)
Robert Kough Jr (Penn/Cook Twp)
Gary Martin (Penn Twp)
Duane Nieves (EMS 80)
Jeff Snyder (Chief 3)
Doug Hockenberry (PD 17)
Dawn Kell (Carlisle Area
School District)
Eric Sands (Carlisle Area
School District)
Mike Guido (Dickinson College DPS)
Greg Miller (CC APO)
Wayne Myers (West Pennsboro
Twp)
Randy O'Donnell (Chief 4)
David Lindenmuth (Shippensburg
Boro EMA)
Clyde Tinner (FD 52)
Robert Murray (FD 52 & FD 54)
Fred Scott (PD 31)

FAQ'S (CONTINUED)

Q: Are there more than two radio system vendors to choose from? Will there be more than one dealer to purchase new radios from?

There are multiple P25 radio system vendors on the market today that offer systems that have the ability to use multiple manufacturer brands on their systems. For instance, the State of Ohio authorizes Relm, Kenwood, Motorola, EF Johnson and Harris radios to be used on their systems. In terms of dealers, we can require that vendors provide more than one dealer. However, bulk purchases would be bought directly from the Manufacturer without a dealer involved.

Q: Is there a leasing option available from the two major vendors?

Yes, in recent years multiple vendors have offered leasing and loan options for both systems and radios.

Q: What is the advice on purchasing new radios now?

End user agencies who want to purchase radios ahead of the new P25 system completion will likely want to purchase a radio that has the ability to work on the current OpenSky radio system as well as a new P25 system when complete. Because OpenSky is proprietary technology, only Harris radios are capable of using this system. Therefore, any radios purchased for the ability of using on both systems will need to be Harris manufactured with OpenSky and P25 capability. It is essential to ensure that the selected radios do both technologies. The original model mobile radios (M803) are not P25 compliant, therefore will need to be replaced prior to the transition to P25.

Q: What is the plan for the paging system?

Once a vendor is selected for the project, the paging system will be included as part of the negotiation to evaluate if a P25 Paging system will suit our needs. If it will, then we may incorporate that into the project and the paging system could be used for both communications and paging. If it will not meet our needs, then we will develop a plan to complete a paging system along with our current project. The County has established a working group to assist with the paging replacement project.

Q: What is the projected life span of a P25 system?

With simple upgrades we can expect this infrastructure and technology to last for many years, relieving a financial burden for all stakeholders. Just like a cellular phone, there will always be radios manufactured that offer new features the end-users may desire to purchase throughout the life of the system. Proper planning will ensure the infrastructure we put in place today will be able to utilize those radios for the foreseeable future and the open architecture of P25 will provide end users with the greatest selection and pricing for many years to come.

Q: Will the County be funding the purchase of end-user radios?

No decisions will be made until there is a better estimate of total project costs. However, during our meetings with other PSAPs at the beginning of our project, several creative funding and purchasing options were shared with us that ultimately saved everyone time and money. The County has been exploring those ideas, as well as other funding and procurement options. We will continuously seek information on grant opportunities that both the County and our public safety partners may be eligible to apply for. In May, DPS hosted a grant writing class that is designed specifically for police, fire, EMS, local emergency management agencies, and municipalities. The class covered how to find grant opportunities, as well as teach the essential skills in crafting quality grant applications that can boost your grant award success. As a historical point of reference, when purchasing the current radio system, the County established an equipment baseline for front-line emergency responders. The County paid for two-thirds of the baseline and the agency was responsible for the remaining one-third. Any additional equipment above the baseline was the sole responsibility of the agency.

Q: Will the county consider a RFI vs RFP during the procurement process?

Both of these options are available to the County as well as many others, and whichever

method or combination of methods provides the best solution while following County purchasing code could be used to solicit vendor information/design/pricing.

Attendees (continued):

Jerry Swope (Southampton

Twtp EMA)

Amy Myers (FD 41)

Dave Murdoch (FD 12)

Dave Holl (Lower Allen Public Safety)

Ted Wise (FD 4)

Bruce Barclay (New Cumberland

River Rescue)

James Peterson (PD 26)

Dave Wickard (FD 46)

Jim Ryan (FD 46)

Jeremiah Whistler (FD 41)

Michael Otto (FD 36)

Brandon Ritchie (PD 28)

Robert Horning Jr (FD 33)

Mike Minich (FD 34)

Jeff Nelson (FD 34)

Tim Yingst (FD 36)

Dan Grimes (FD 45)

Brad Wright (FD 22)

Rick Dayton (FD 22)

Michael Hope (PD32)

John Friel (PD 32)

Dexter Owen (FD 20)

Doug Gochenour (FD 30)

Roger Ciecierski (Mechicsburg Boro)

Margaret Myers (PD 22)

Gary Neff (FD 28)

Steve Spangler (LEPC)

Dan Burkett (FD 49)

Will Davis (FD 49)

Troy Russell (CC DPS)

Shawn Melhorn (CC DPS)

John Quirk (CC DPS)

Claudia Garner (CC DPS)

Brian Hamilton (CC DPS)

Bob Shively (CC DPS)



Q: Would the County consider investing more money into the infrastructure if the end-users purchased all of their equipment on their own?

At this point, we do not have enough information to commit to any design or financial obligations. However, as stated in our goals for the project, we are committed to working collaboratively in finding the most effective and cost efficient solution for both the County and our public safety partners.

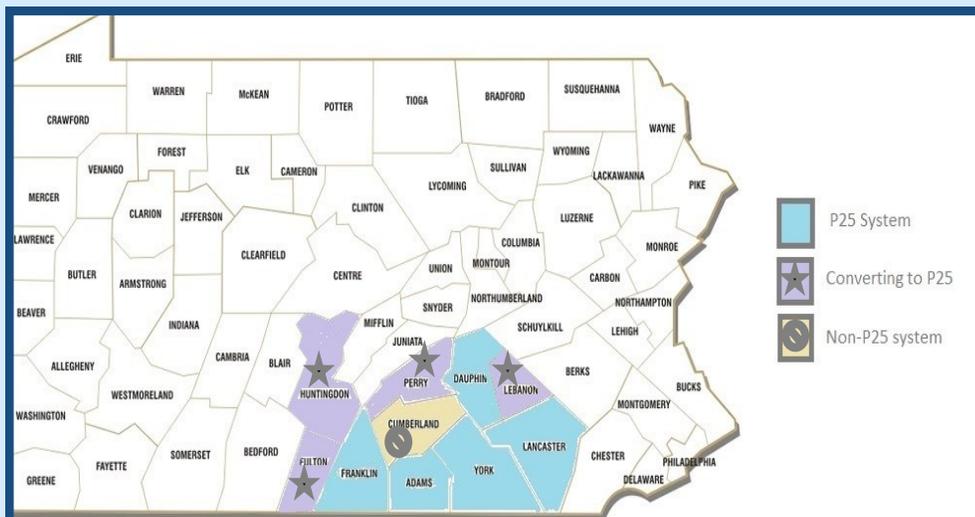
Q: We have heard Harris may be listed as a 'deficient vendor' with the state?

We have not seen any official publication of that. However when we are ready to begin the procurement process, we will be contacting several previous customers for each vendor to ascertain a project overview of their impression of the equipment, implementation, resources, budget, etc. Including, but not limited to, COPA, who has current and previous experience with two of the largest LMR vendors.

Q: Why is there \$40,000 in the 2016 Public Safety budget for an upgrade to the current Harris radio system?

The county budget is developed in July and August for the following calendar year. At the time of the 2017 budget submission, a new radio system was still in the conceptual phase and there was no decision to move forward on the P25 project at that time. We felt it was necessary to include the potential cost of a recommended system release upgrade of the existing radio system with the intention to put that on hold if given the notice to proceed.

Q: What is the status of radio systems in neighboring counties?



INTER-COUNTY RESOURCE OPTIONS

04-20-2017

On April 20th, 2017, we met with several of our neighboring counties to share information on their system design, capabilities, limitations, and operational policies. We talked in depth about the technical aspects of user ID's, encryption options and keys, and the non-proprietary interface (ISSI) that enables systems built by different manufacturers to be connected together into wide area networks, so that users on different networks can talk with each other. We also discussed what options we would have in sharing resources that are mutually beneficial and could help in decreasing costs for the counties, in terms of both equipment and maintenance costs. As the project continues, there will be further discussions with our neighboring counties to provide the highest level of interoperability for our end users and for those companies outside the county who provide mutual aid services to our residents and visitors.

Timeline

April 2017: Meeting with neighboring counties to discuss radio systems and resource options

April - May 2017: Assessments of current infrastructure, dispatch consoles, and compilation of data submitted

What's Next?

May 2017: Meeting with Board of Commissioners to provide survey results and recommendations

Establish Radio Project Advisory Board membership

REDIRECTION OF THE PROJECT

5-03-2017

When the project began, one of our primary objectives was to reach an impartial recommendation for a radio system vendor and secure a contract by the end of 2017. On May 3, 2017 the DPS Project Team and SSC Consulting, LLC provided a project update to the Board of Commissioners (BoC). SSC reported there was 29 agencies that responded to the outreach end-user assessment & data collection tool, previously referred to as the 'outreach survey.' Those agencies represented in the responses included: 5 county departments, 10 police departments, 4 EMS departments, 16 fire departments, and one municipality. A full report of the results will be prepared and shared with the project team to incorporate into the planning process.

SSC recommended the next step in the process would be to develop a site plan that would meet the specifications of a successful radio system. The site plan will identify what existing tower sites will remain, which ones will need modified or upgraded, and how many new sites will need constructed. A new tower site can take anywhere from 12-24 months to construct dependent upon things such as site acquisition, procurement processes, engineering and actual construction. If a vendor and radio system was selected now, there would be a significant time delay until implementation. Additionally, the actual construction of towers would all be done by subject matter experts and if conducted through the radio vendor, could result in 25-34% mark up on infrastructure costs to the county. Therefore given the time delay while technology continues to advance and the significant potential cost savings, SSC recommended to the Board for the county to build out the infrastructure on their own. Having the site plan designed and built to the desired specifications prior to soliciting a vendor will also be advantageous in that it will prove a more comparable quote from the radio vendors.

P25 RADIO ADVISORY BOARD

05-26-2017

In accordance with our project goal to work collaboratively and transparently with our public safety partners in all aspects of the project, a P25 Radio Advisory Board was established. The members of the board were finalized in May and we are pleased to have representation from each discipline, municipalities, and elected officials. The group will meet on a regular basis to discuss the current status of the project and serve as a critical link of information so that we are sure to have each partners' perspective throughout the project. The DPS Project Team and staff look forward to working with each of our members to design the future radio system.

P25 RADIO ADVISORY BOARD

CAPITAL REGION COUNCIL OF GOVERNMENTS

Commissioner Nate Silcox
Hampden Township
Commissioner Ken Martin
Upper Allen Township

WESTERN CUMBERLAND COUNCIL OF GOVERNMENTS

Gary Martin
Supervisor - Penn Township
Wayne Myers
WCCOG President / West Pennsboro Twp
Zoning and Codes Enforcement

LAW ENFORCEMENT

David Holl
Public Safety Director - Lower Allen Twp Police
Department / EAB Member
Barry Sherman
Public Safety Director - Middlesex Twp Police
Department / EAB Member
Fred Scott
Police Chief - Shippensburg Borough Police
Department

FIRE DEPARTMENT

Randy O'Donnell
Fire Chief - Shippensburg Borough Fire
Department / Naval Support Activity / EAB Member
Larry Treese
Deputy Fire Chief - Creekside Fire Company
(East Pennsboro Twp)

FIRE POLICE/SPECIAL POLICE

Mike Ott
Fire Police Association / Chief of SPERT / Silver
Spring Township Fire Company
Brad Mills
Fire Police Association / Fire Police Captain - West
Shore Bureau of Fire

EMS

Duane Nieves
Chief - Holy Spirit EMS Director of
Field Operations / EMS Council
President/EAB member
Jeff Salisbury
Assistant Chief - Cumberland
Goodwill EMS



RADIO ADVISORY BOARD MEETING

06-08-2017

On June 8, 2017 DPS hosted the first Radio Advisory Board meeting to provide the members with a detailed overview of the project, review the goals and objectives, current timelines, and establish an open line of communications. Members had an opportunity to share questions from their respective disciplines as well as review the questions and answers from the outreach sessions with our public safety partners. There were 29 agencies that responded to the end-user assessment & data collection tool (5 county agencies, 10 police agencies, 4 EMS agencies, 16 fire departments and 1 municipality), and those results were reviewed with the board.

RADIO ADVISORY BOARD MEETING

10-25-2017

Mike Browne, SSC Consulting, provided the RAB members with an update of the project work they have completed thus far. Browne shared the status of the Commonwealth of PA Radio Project (see image below) in which they are beginning implementation in the western part of the state with completion by 2021. He continued by explaining in the course of our site planning development we will also be talking with surrounding County's to explore resource sharing and interoperability. This will all be used to determine what the best path will be for Cumberland County in terms of operational value, cost effectiveness, vulnerabilities, management and oversight, radio coverage and the ability to leverage a choice of subscriber devices with the best pricing available. Additionally, it is known that the fire paging system is at the end of life and a plan for replacement is being evaluated as well. Options are being explored for implementation to occur simultaneously with the new radio system.

Browne shared the initial review of the site plan coverage maps based on using as many existing towers as possible. The ability of the sites to be able to penetrate into the end-user identified critical buildings is key and gives a general understanding of building density and system coverage expectation. Site plan work will continue and will be provided as it becomes available. Another element of the plan is the network connection between the towers.

The next steps for SSC Consulting will be:

- SSC County to evaluate new site locations
- Prepare system wide coverage maps for review
- Compare coverage expectations against critical building infrastructure
- Evaluate backhaul capability and bandwidth requirements
- Prepare for Site Civil RFP

The PowerPoint that SSC Consulting shared at the meeting is available on the DPS website pages.

Timeline

May 2017: SSC recommended redirection of project

May 2017: Radio Advisory Board (RAB) established

June 2017: First meeting of RAB to provide overview, objectives, and establish communications

July-October 2017: SSC Consulting conducting site plan evaluations, developing coverage maps, and exploring cost savings options

October 2017: SSC Consulting met with the RAB to review the initial findings of the site plan

What's Next?

SSC Consulting continuing site plan work to present findings to the Commissioners and RAB.

STATEWIDE DEPLOYMENT SCHEDULE

FISCAL YEAR: 2017-2018

FISCAL YEAR: 2018-2019

FISCAL YEAR: 2019-2020

FISCAL YEAR: 2020-2021

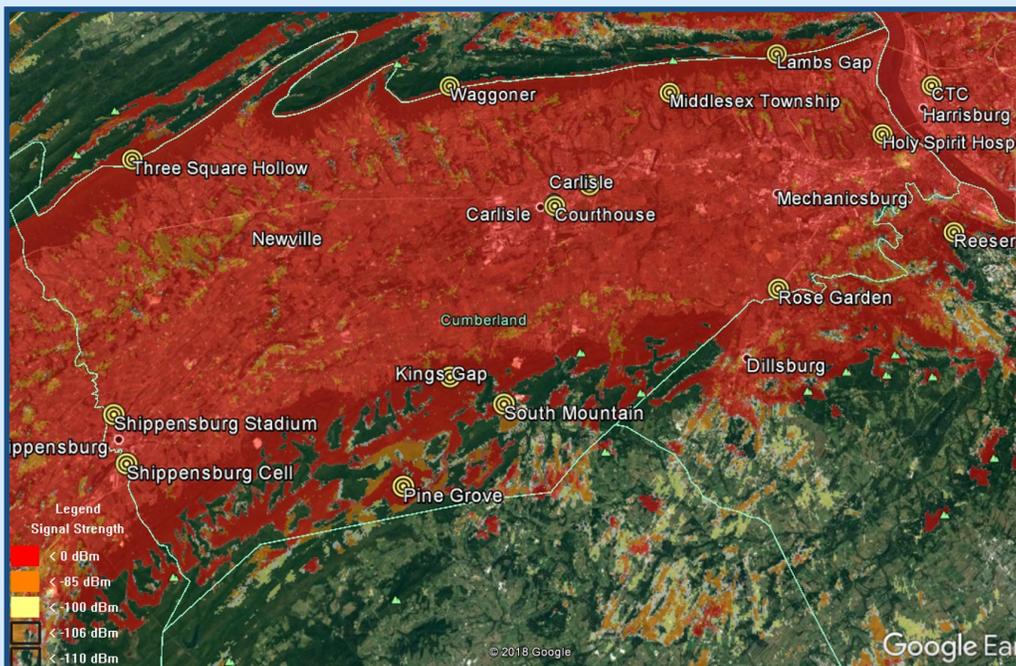
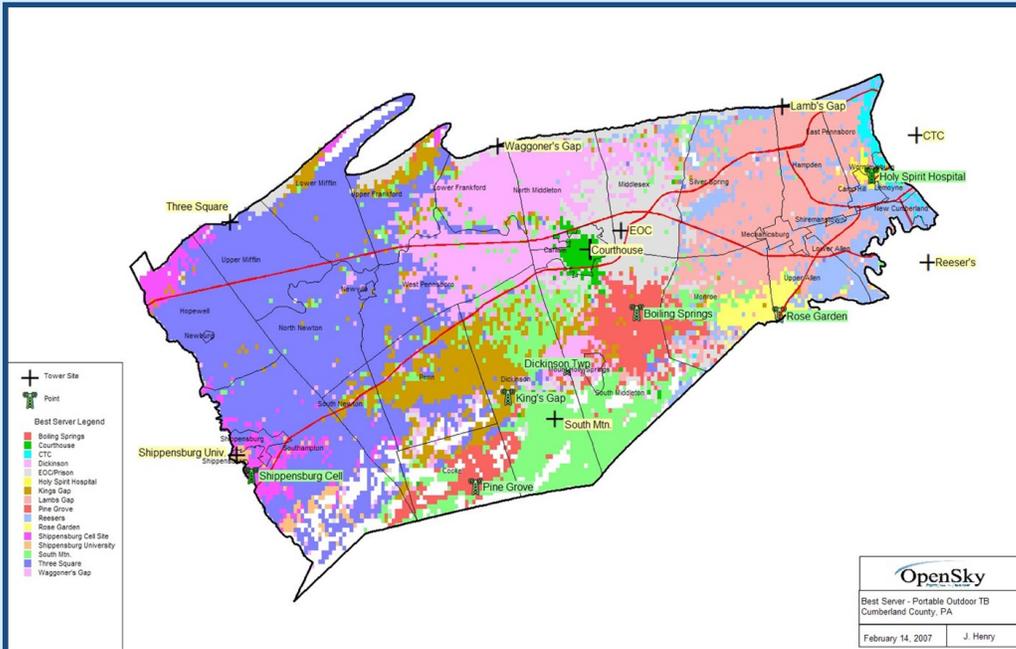
For more information on Partnering, contact:
 Robert Barnham, Director
 Pennsylvania State Police Statewide Radio Network Division
 8001 Bretz Drive, Harrisburg PA 17112
 Phone: 717-346-8058
 rbarnham@dps.gov

RADIO ADVISORY BOARD MEETING

03-22-2018

Mike Browne, SSC Consulting, reviewed the list of approximately 80 critical buildings within the county that were identified through the end-user tool and their associated probability with having coverage inside the building on a P25 system. Additionally, he reviewed some geographical areas within the county that are known current areas of concern such as: Shippensburg Road (area winding up through the South Mountain), Doubling Gap area (just north of Col. Denning State Park), Perry County – Spring Road (north of Cumberland County

line), Baltimore Pike (near intersection of Oxford Road), and Pine Grove Road (between Michaux Road and Shippensburg Road). Browne shared the graphic depictions below that show the current sites in P25 compared to the current OpenSky system, from portable on street perspective. The top image reflects the OpenSky coverage, with the white areas throughout the county currently experiencing a lack of coverage. In comparison, the bottom image reflects the P25 coverage, using the same sites, with the green areas identified as potential areas for lack of coverage.



Note: Board Member Larry Treese (East Pennsboro Township, Creekside Fire Company) moved out of the area and Chief Dave Murdoch (Lower Allen Township, Lower Allen Fire Company) was appointed by the Fire Chiefs Association to fill the position.

Timeline

March 2018: SSC provided RAB with site plan update

April 2018: SSC provided Commissioners with site plan update

What's Next?

Develop site plan implementation plan with timelines, pricing and procurement.



Cumberland County Department of Public Safety

1 Public Safety Drive ~ Carlisle, PA 17013 ~ 717-218-2900

Project publications and updates will be posted at:



Online: www.ccpa.net/81/Public-Safety-Radio-System

And stay up to date by following us:



Facebook: www.facebook.com/CumberlandCountyDPS/



Twitter: https://twitter.com/ccpa_net_dps911