Wireless Internet Expansion

&

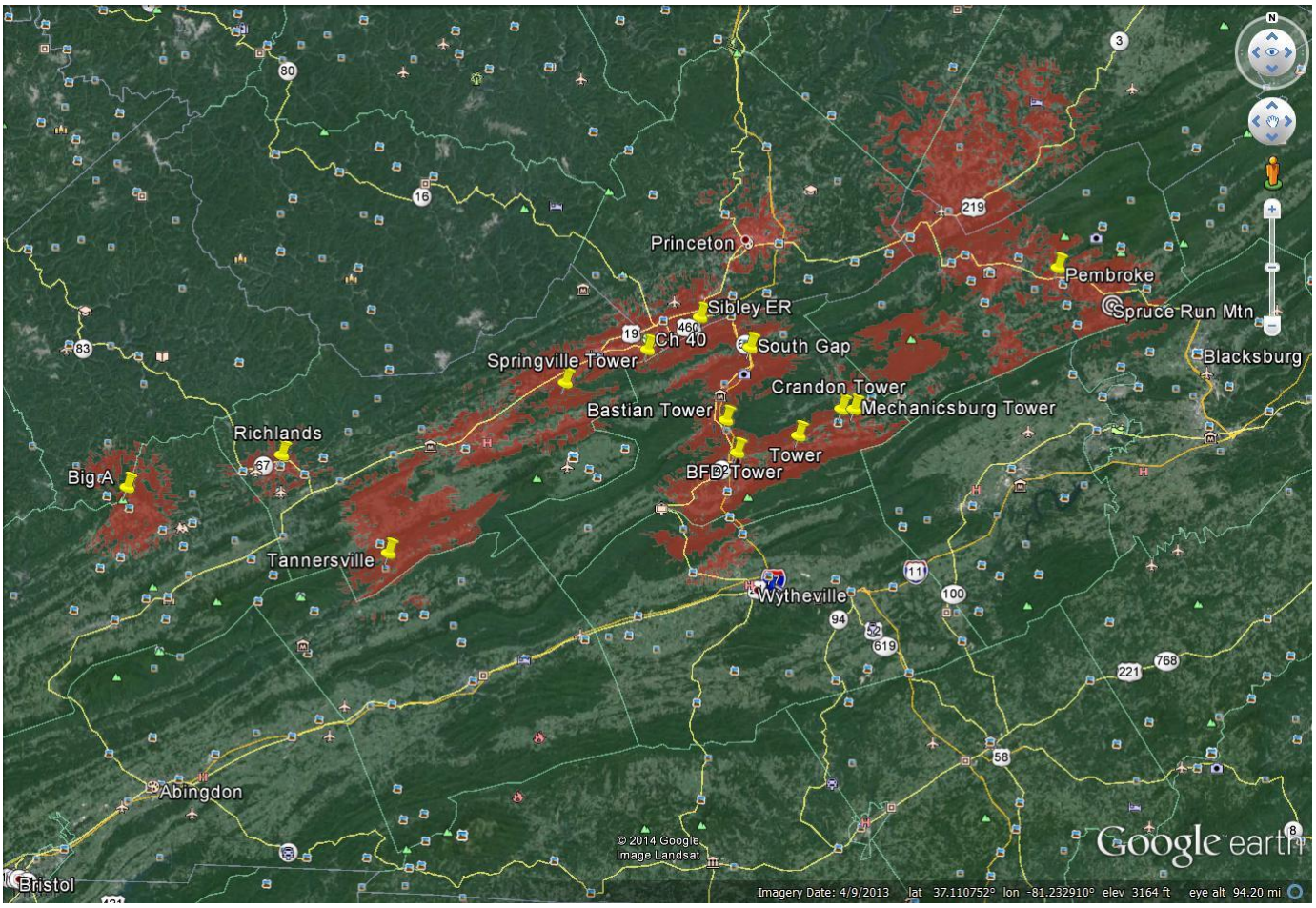
Propagation Study

For Bland County, Virginia

April, 2015

WVVA.net Inc. is a WISP (wireless internet service provider) located in southwestern Virginia that provides broadband access to customers in 7 Counties in both Virginia and West Virginia. Our current coverage covers approximately 2,284 square kilometers (881.86 square miles) with a population of 91,603. The technology used to provide service is known as fixed wireless. It requires a line of site connection from a relay tower or microsite to the customer to transmit data via radio (similar to cell phone technology). The technology is evolving rapidly with speeds approaching 500Mbps. For rural connectivity, this technology is the most cost effective way to get service to a large percentage of the population.

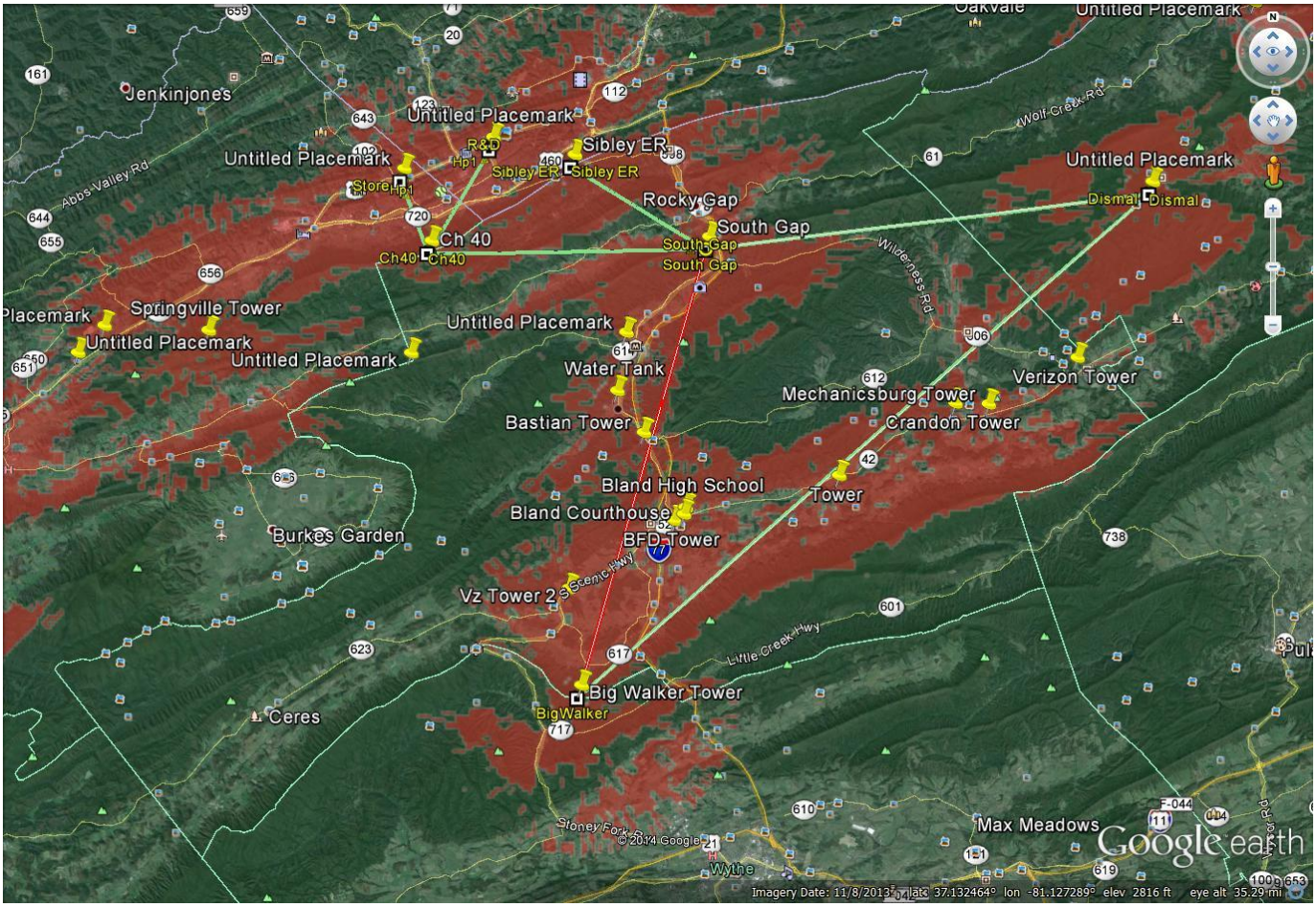
Below is a map showing the current WVVA.net coverage area. WVVA.net has partnered with the Bland County Wireless Authority (BCnet) to provide wireless Internet solutions for Bland County, Virginia and is included in this current coverage map. BCnet wishes to extend their coverage throughout Bland County to provide services to the majority of the population. This plan proposes how to expand the current network.



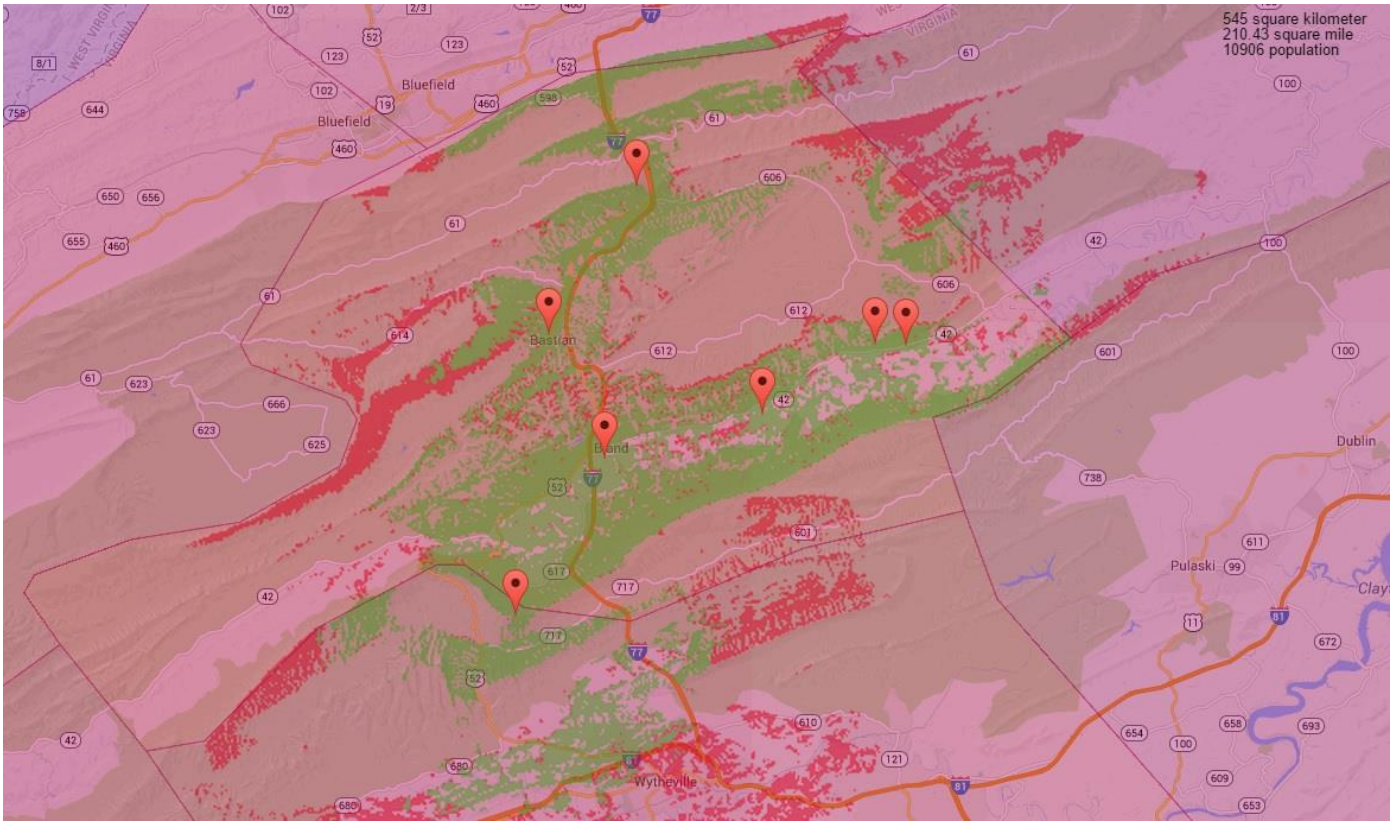
The WVVA.net Network

BCnet Existing Infrastructure

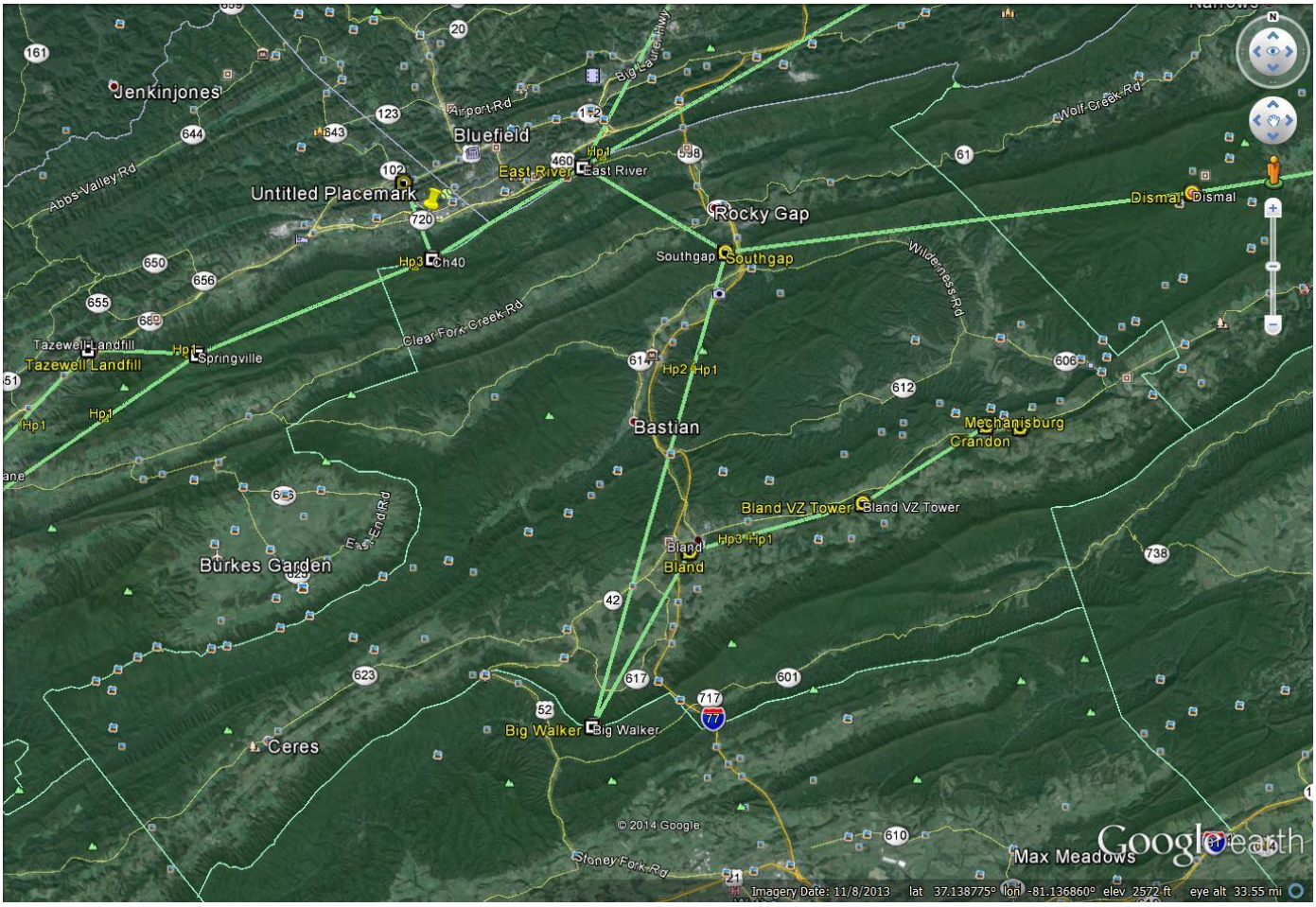
BCnet currently has 7 towers covering the heart of the County. These sites include SouthGap, Bastian, Big Walker, Bland, Point Pleasant, Crandon and Mechanicsburg. Below is the current coverage from these sites. The sites provide adequate coverage along most of the interstate 77 corridor and along Route 42 towards Giles County.



The BCnet network currently covers approximately 211 square miles and a population of 10,906. These numbers include some coverage in Wythe County. Here is another “map” view of the current coverage:



The network is backhauled through the Southgap tower to Fiber locations in both Bluefield and Rich Creek, Virginia. Current Backhaul paths are:



Expansion areas.

Infrastructure build out will be needed in 7 different areas to expand services to the bulk of the locations in the County. These include: Ceres, Little Creek, Railroad Trail, Wilderness Road, Grapefield, Route 61 towards Tazewell, and Route 61 towards Narrows.

Phase 1: Upgrade of current equipment

The majority of the backhaul links were upgraded in 2013 to provide better service to existing customers. AP's at Southgap were also upgraded. All other AP's on existed towers are being upgraded in summer 2015 to support faster connection plans. Also the main backhauls are planned for upgrade to enhance capacity from 80Mbps to 400Mbps. Offerings will be upgraded from 2, 6, 10, 15 Mbps to 5, 10, 15, 25Mbps plans.

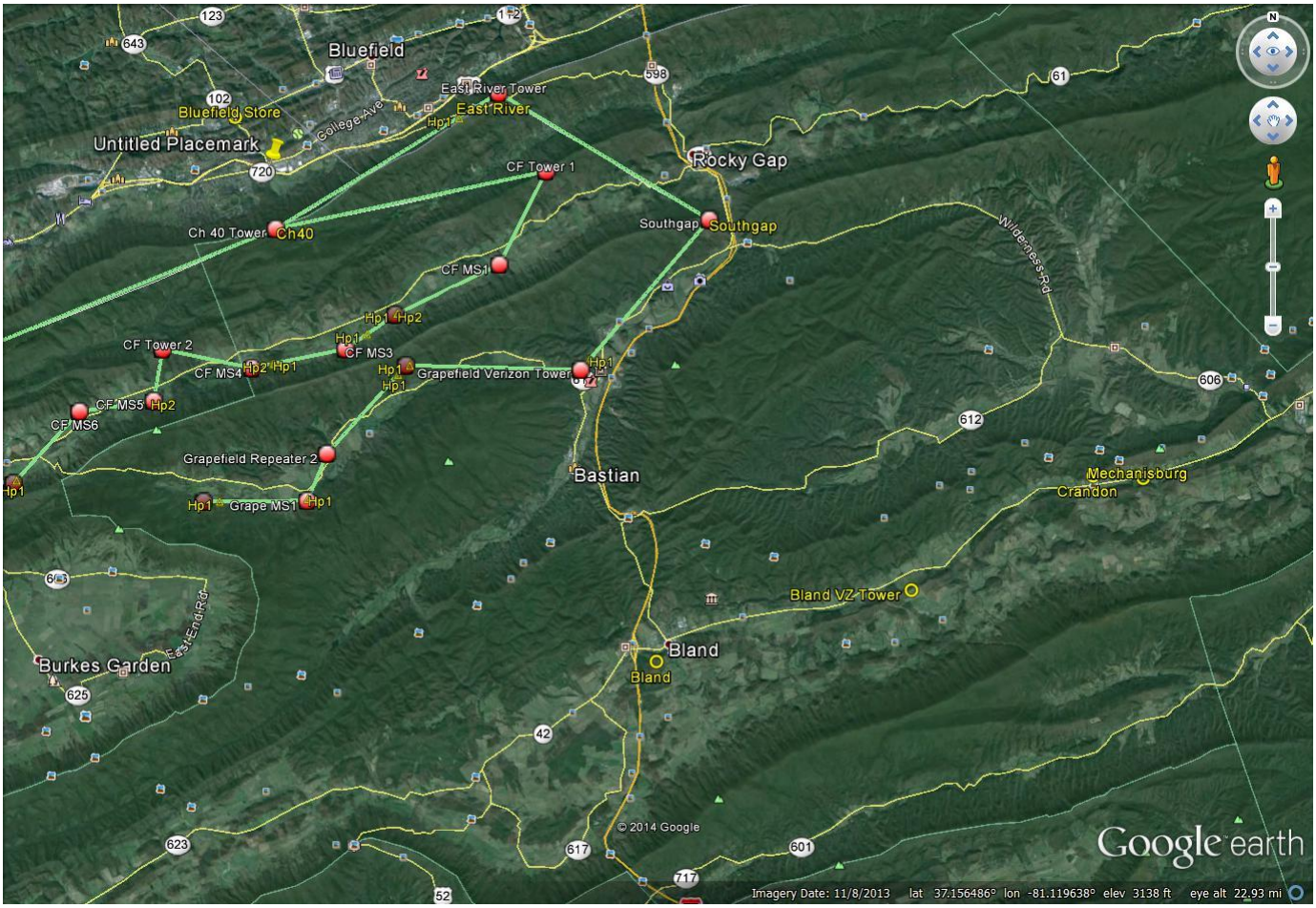
Phase 1 Budget

	No of Units	Unit Cost	Total
Electronic Equipment (Backhauls, AP's, Routers, etc)			$10,500
Customer Premise Equipment	30	$300	$9,000
Site Preparation / Labor	7	$2,500	$17,500
Engineering			$1,000
Total			**$38,000**

Phase 2: Grapefield and Route 61 towards Tazewell

This phase is currently under review for a Community Connect Grant in partnership with Tazewell County. The following is the coverage area proposed by this grant application:

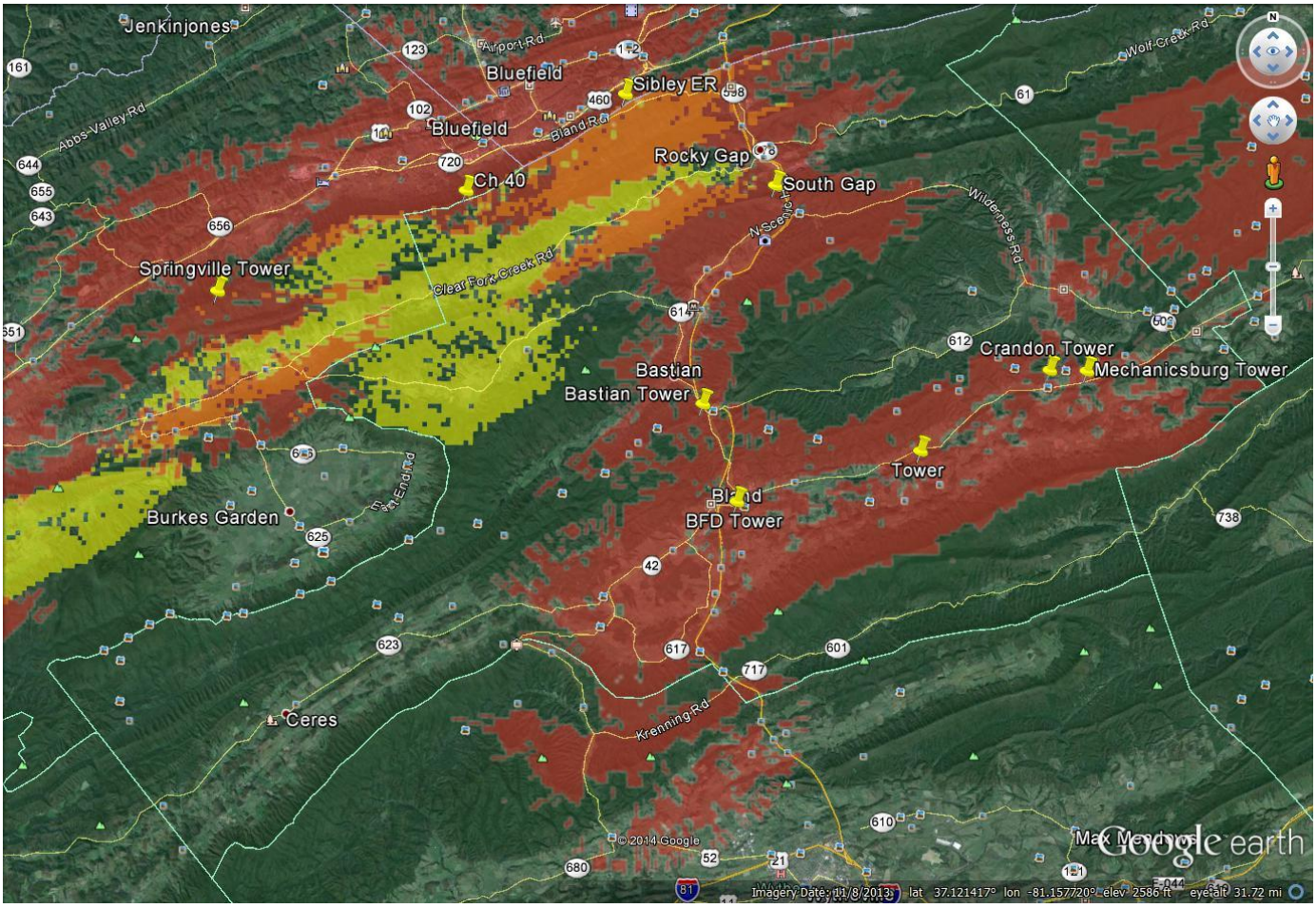
This project includes construction of a two medium sized towers as well as seven microsites in Bland County, as shown below. The phase also utilizes our current infrastructure at Southgap and East River as well as the Verizon tower near Bastian.



Phase 2 Budget (Bland Portion)

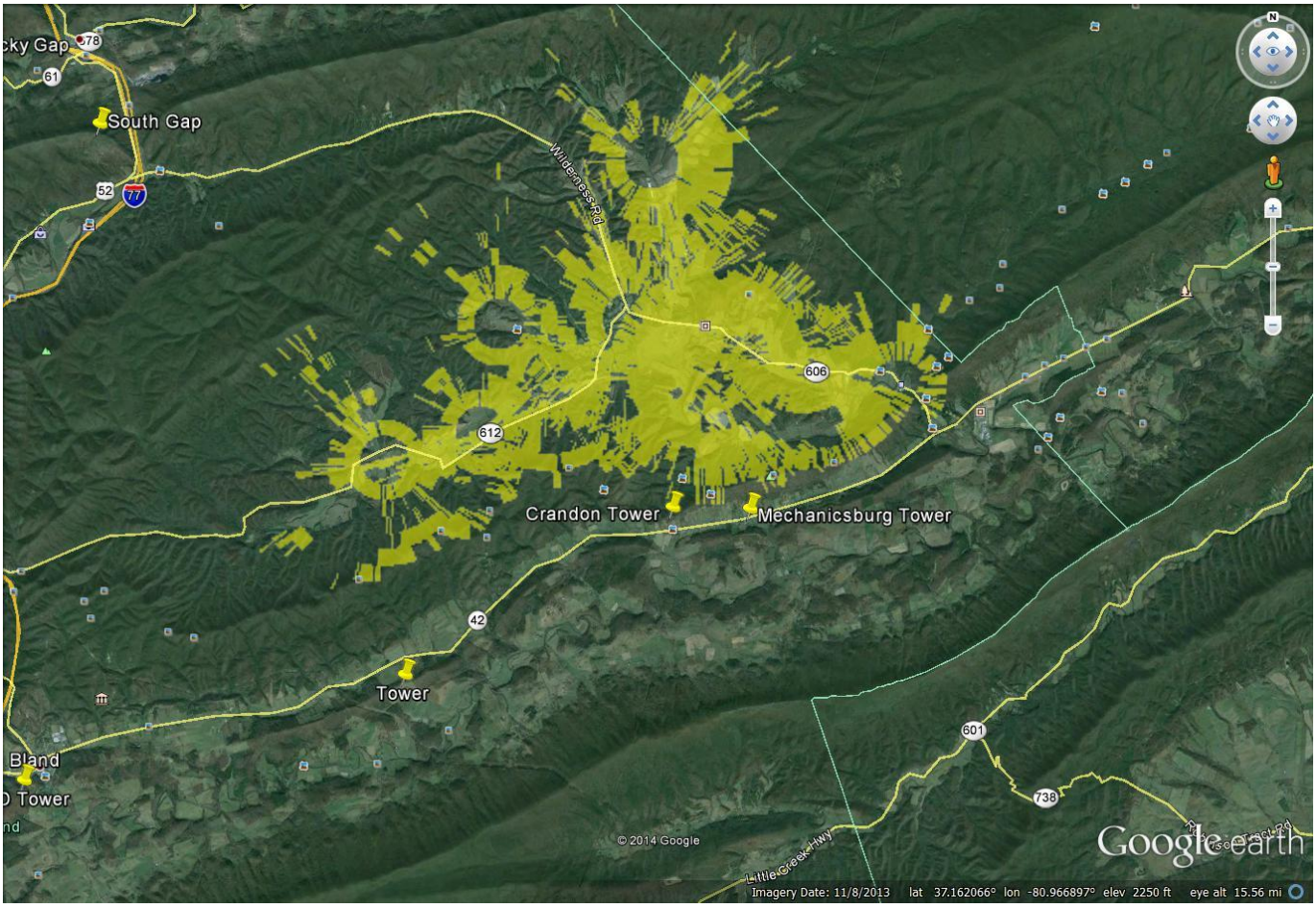
	No of Units	Unit Cost	Total
Electronic Equipment (Backhauls, AP's, Routers, etc)			$45,000
Tower Sites	2	$40,000	$80,000
Microsites	7	$5,500	$38,500
Customer Premise Equipment	125	$300	$37,500
Buildings (tower sites)	2	$2,500	$5,000
Bandwidth Cost			$22,000
Site Preparation / Labor	9	$2,500	$22,500
Engineering			$5,000
Total			**$255,500**

County coverage with the addition of Phase 2 is shown here:

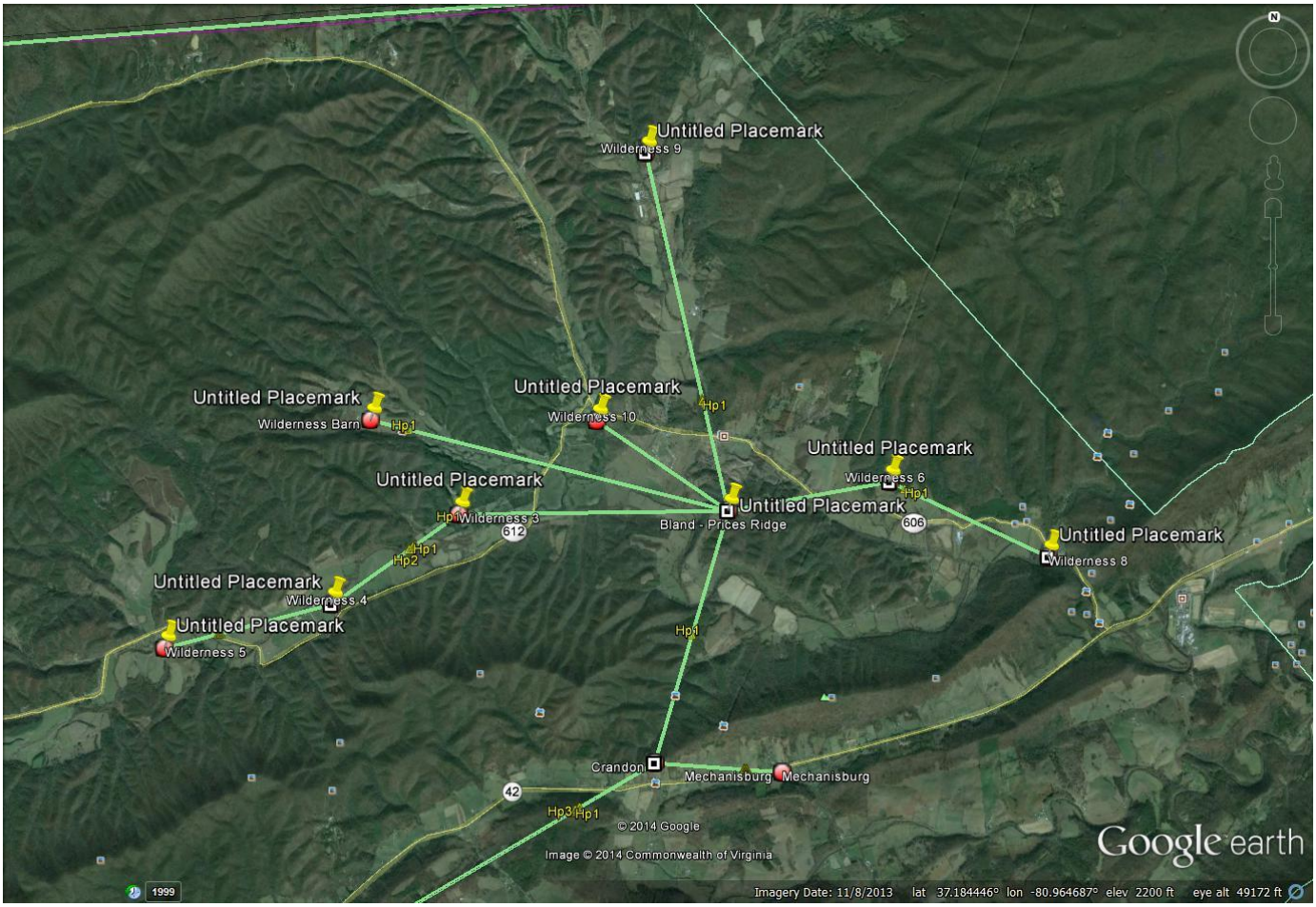


Phase 3: Wilderness Road

This area is well isolated from other parts of the County. We are able to connect it into the network from the Crandon tower site. The area will require one small tower and approximately 8 microsites. Coverage map is below:



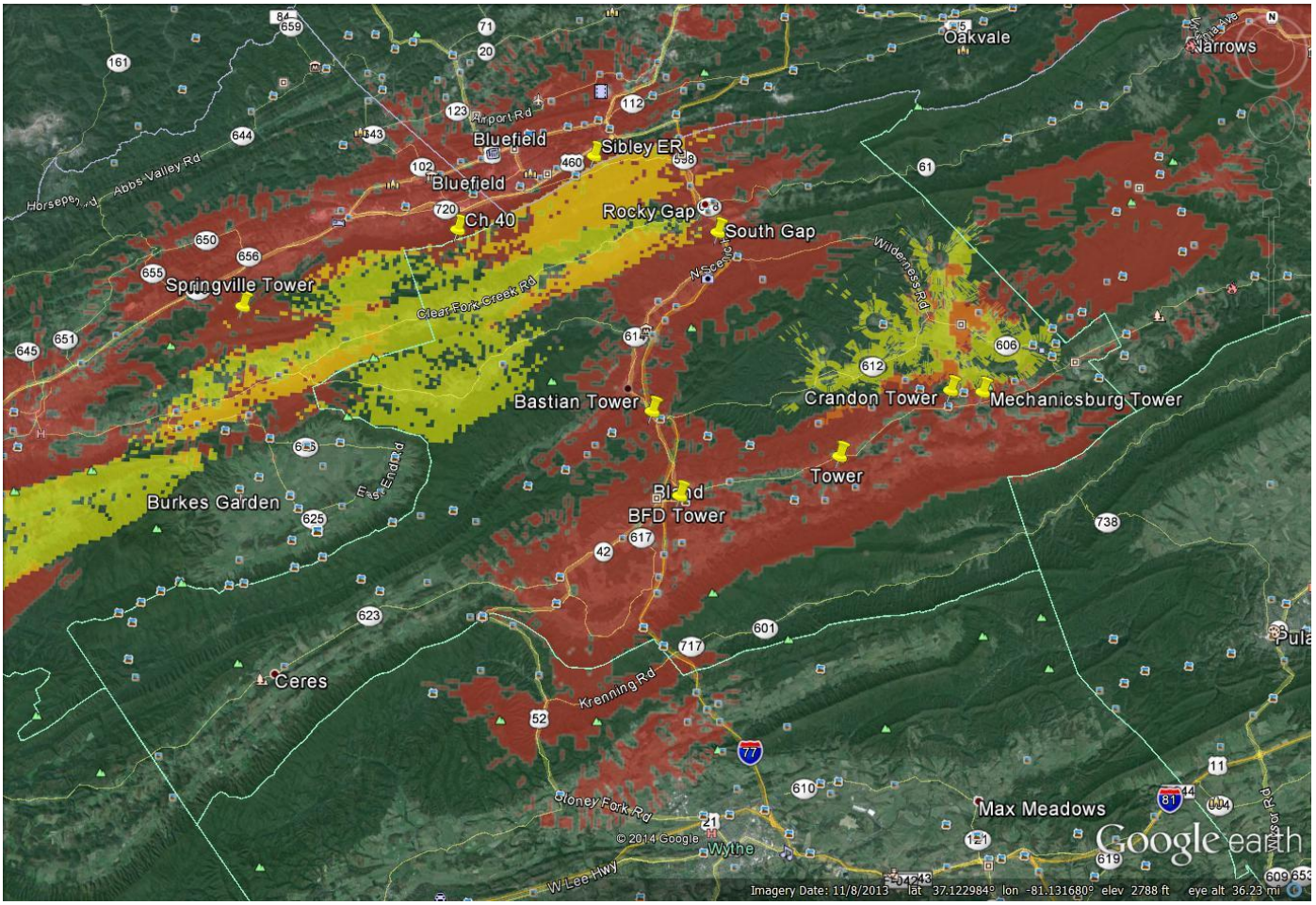
Backhaul connectivity map:



Phase 3 Budget

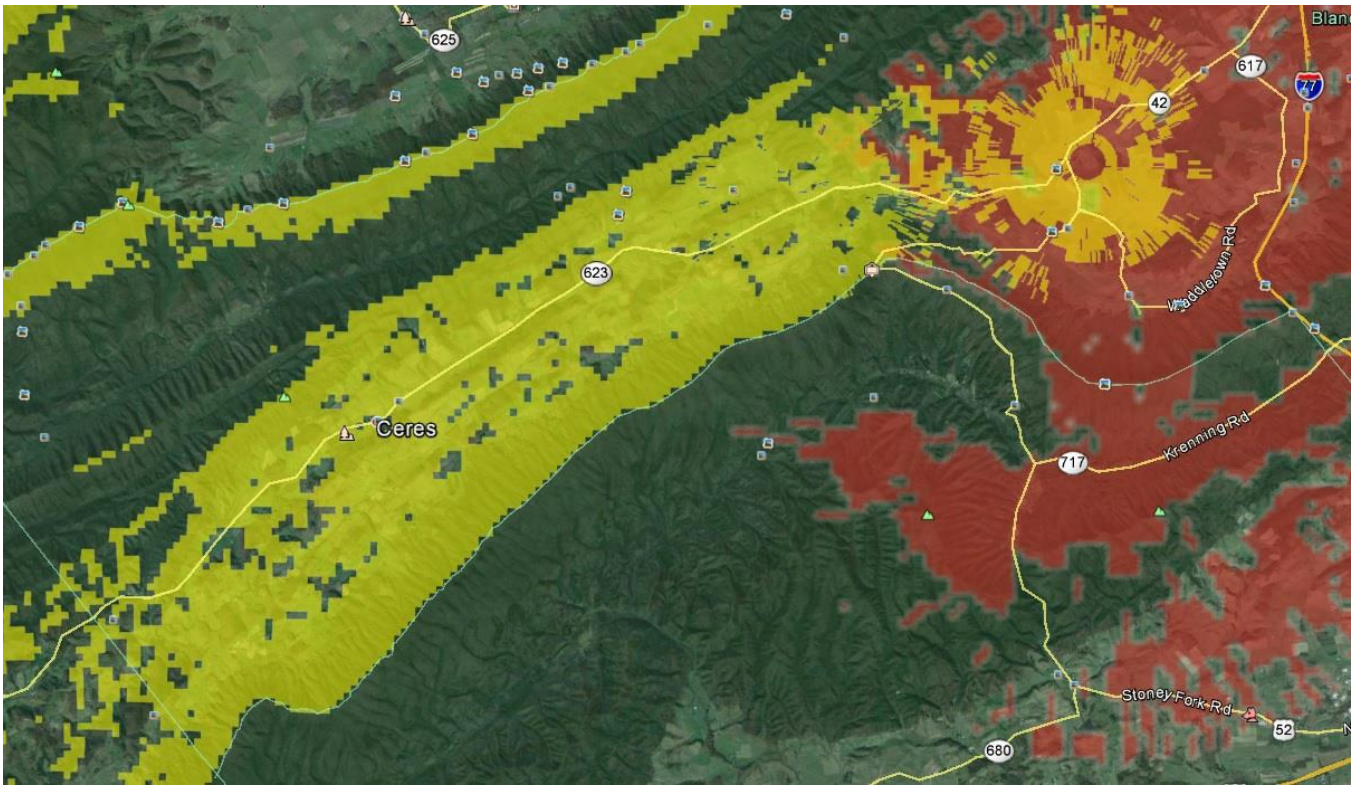
	No of Units	Unit Cost	Total
Electronic Equipment (Backhauls, AP's, Routers, etc)			$25,000
Tower Sites	1	$40,000	$40,000
Microsites	8	$5,500	$44,000
Customer Premise Equipment	50	$300	$15,000
Buildings (tower sites)	1	$2,500	$2,500
Bandwidth Cost			$10,000
Site Preparation / Labor	9	$2,500	$22,500
Engineering			$2,000
Total			**$161,000**

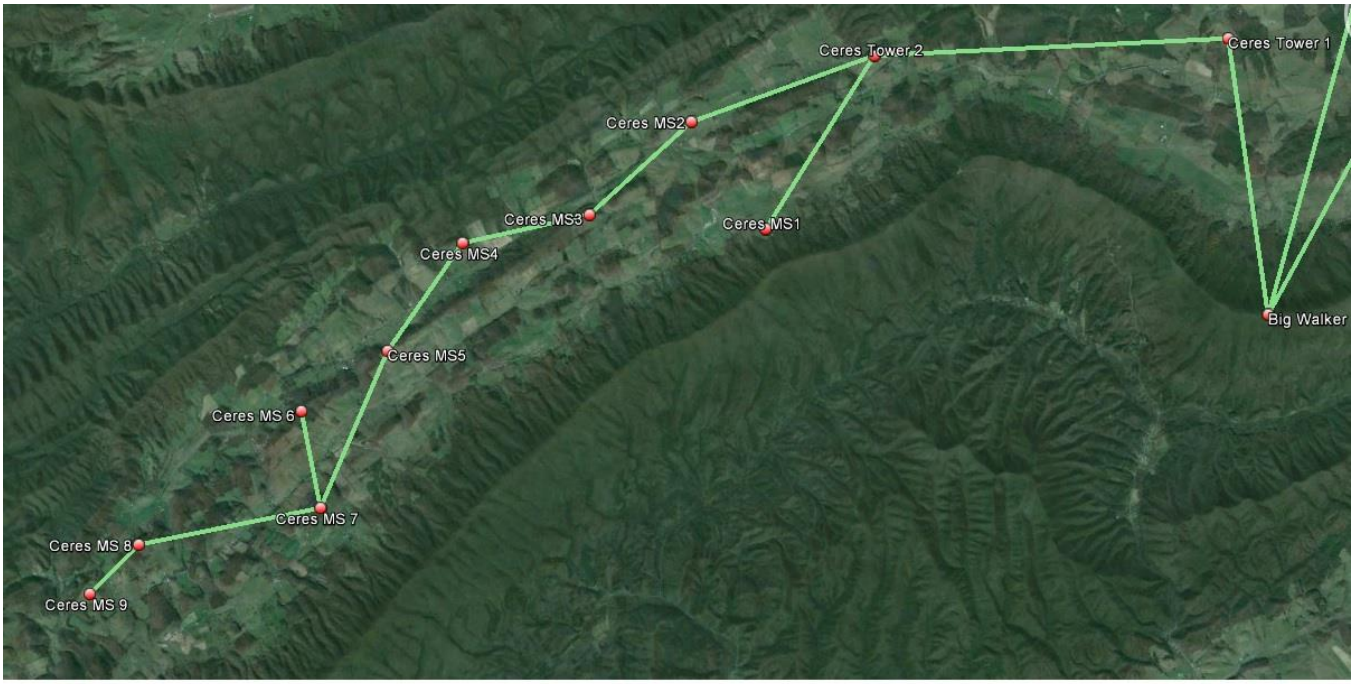
Combined coverage including phases 2 and 3:



Phase 4: Ceres

The valley where Ceres is located is broad and ideal for coverage. Two existing cell towers can be utilized to connect to the current BCnet network. The area will require 9 microsites as well as these two towers. Coverage and backhauling is shown below:

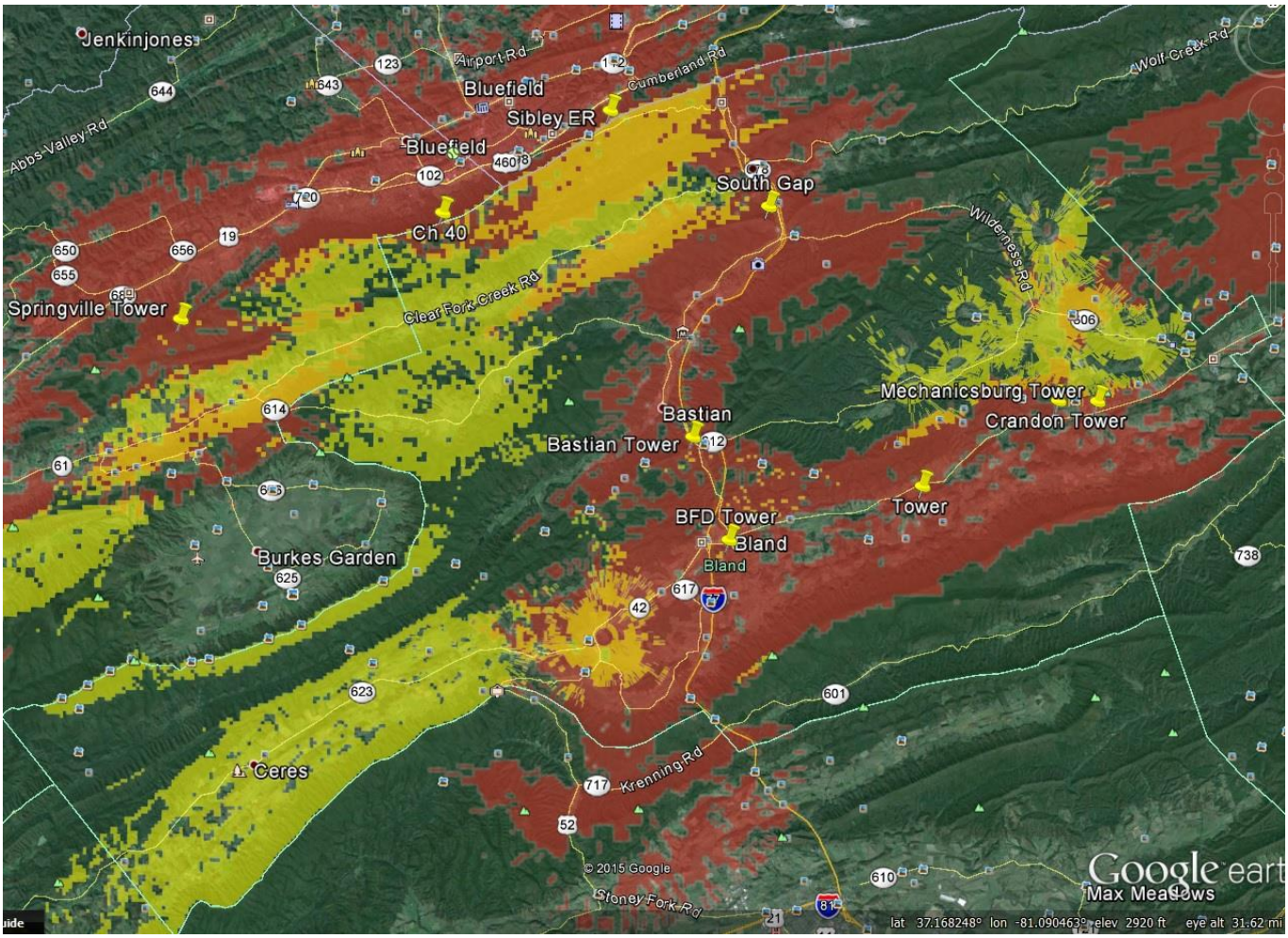




Phase 4 Budget

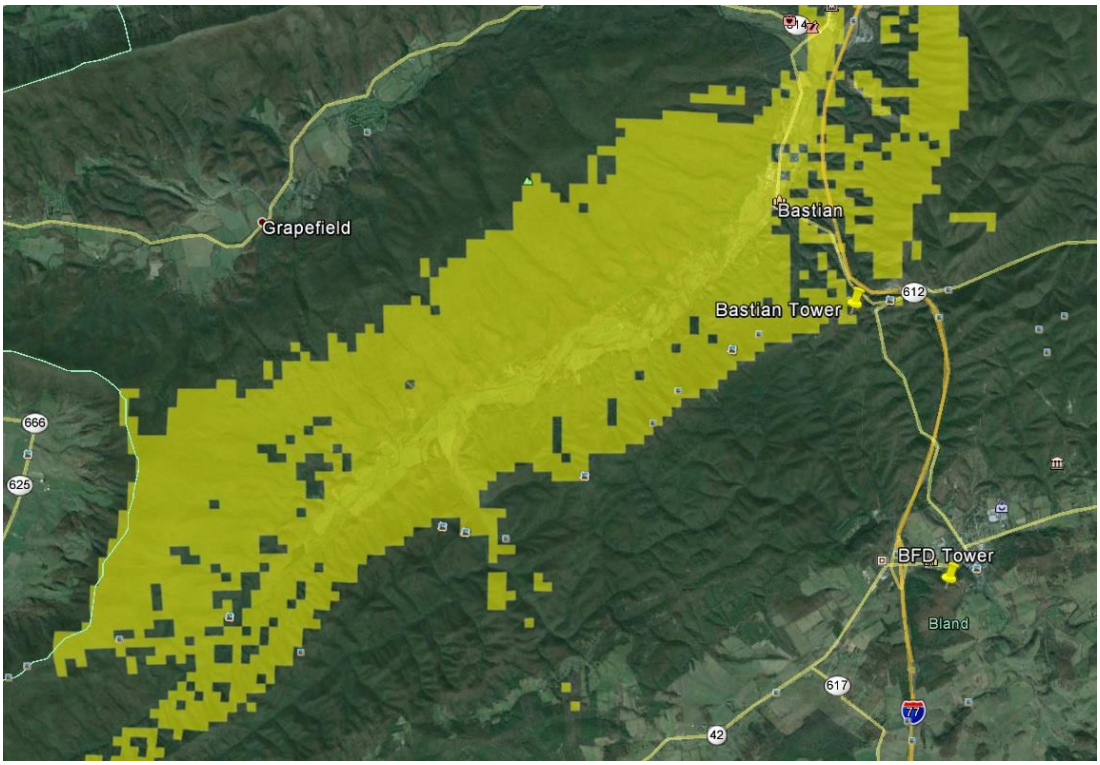
	No of Units	Unit Cost	Total
Electronic Equipment (Backhauls, AP's, Routers, etc)			$25,000
Microsites	9	$5,500	$49,500
Customer Premise Equipment	50	$300	$15,000
Bandwidth Cost			$10,000
Site Preparation / Labor	9	$2,500	$22,500
Engineering			$2,000
Total			**$124,000**

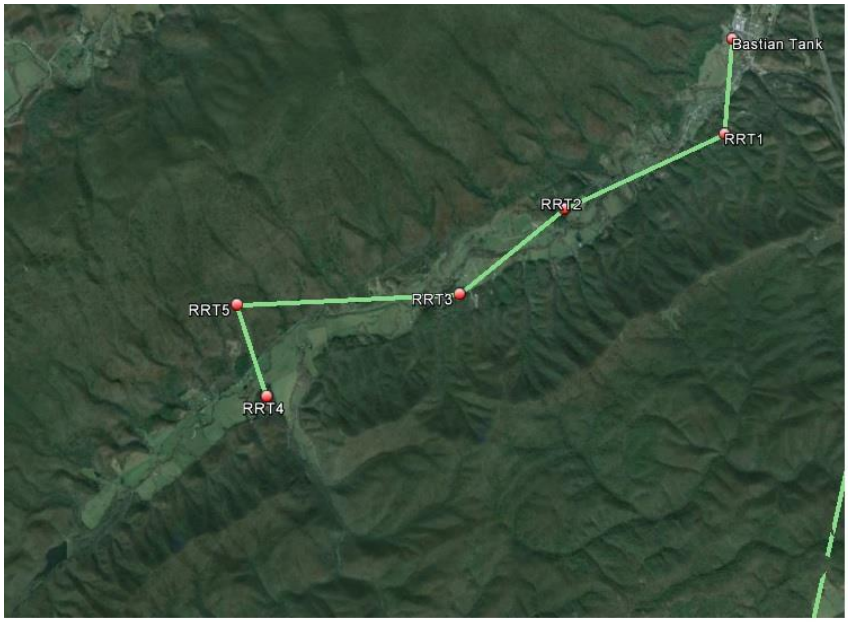
Below is complete coverage phases 1-4:



Phase 5: Railroad Trail

This small valley can get coverage with 5 microsites, with 3 being located at homes to save on cost. Coverage and backhauling is shown below:

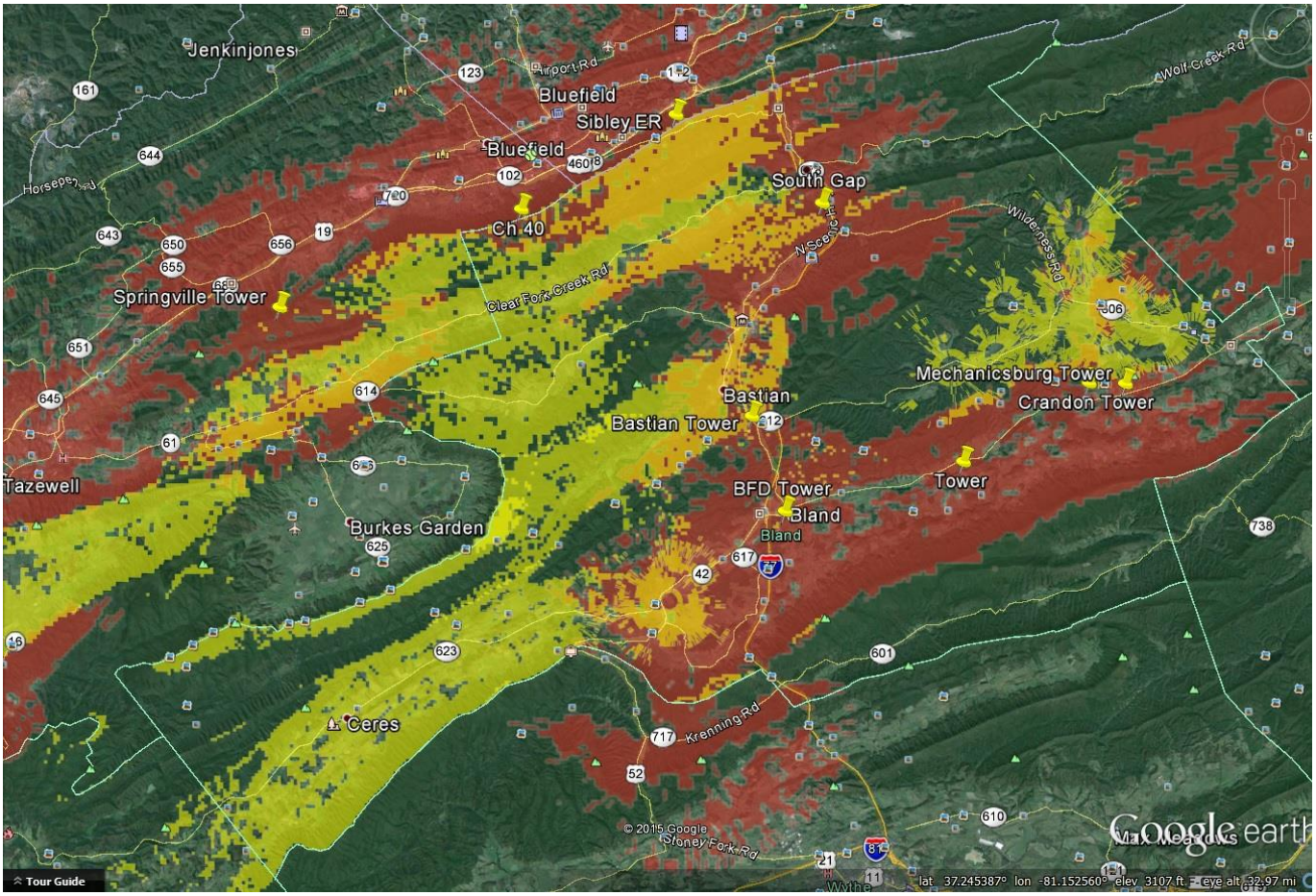




Phase 5 Budget

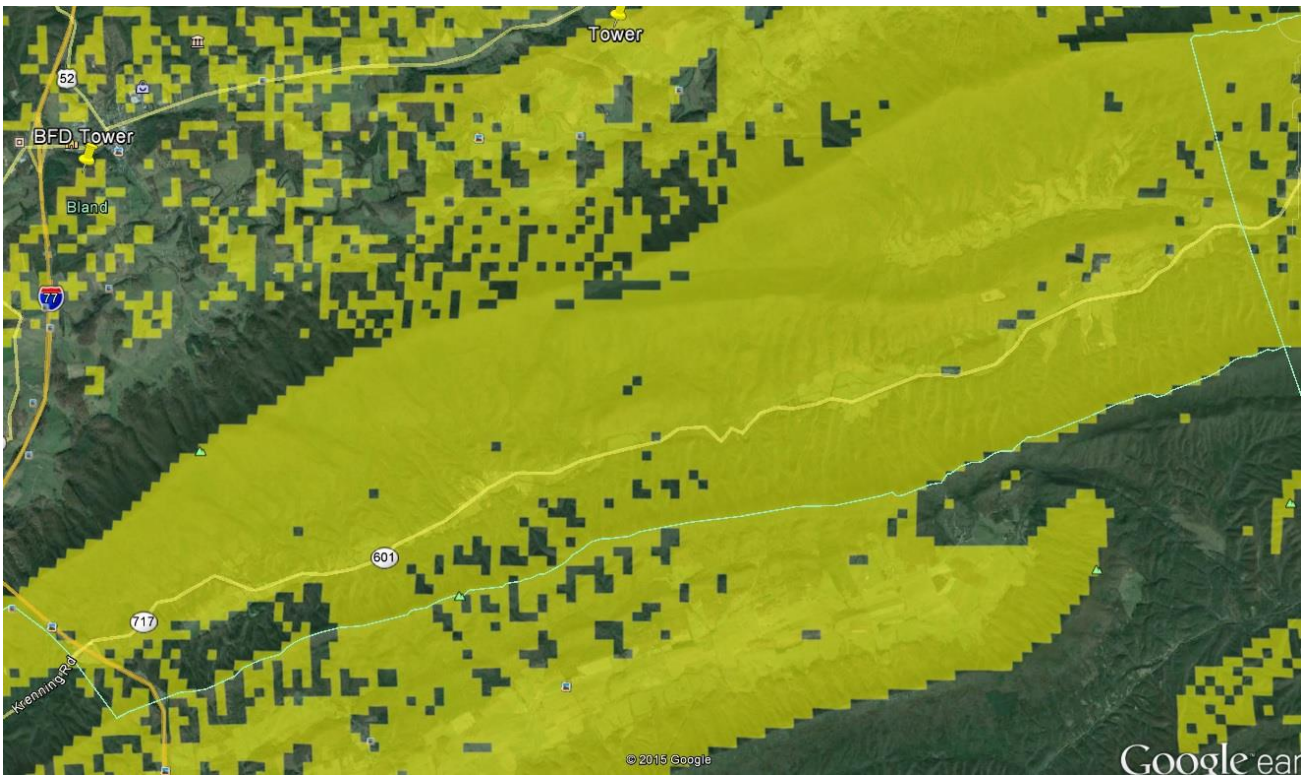
	No of Units	Unit Cost	Total
Electronic Equipment (Backhauls, AP's, Routers, etc)			$5,250
Microsites	2	$5,500	$11,000
Customer Premise Equipment	20	$300	$6,000
Bandwidth Cost			$3,000
Site Preparation / Labor	2	$2,500	$5,000
Engineering			$1,000
Total			**$31,250**

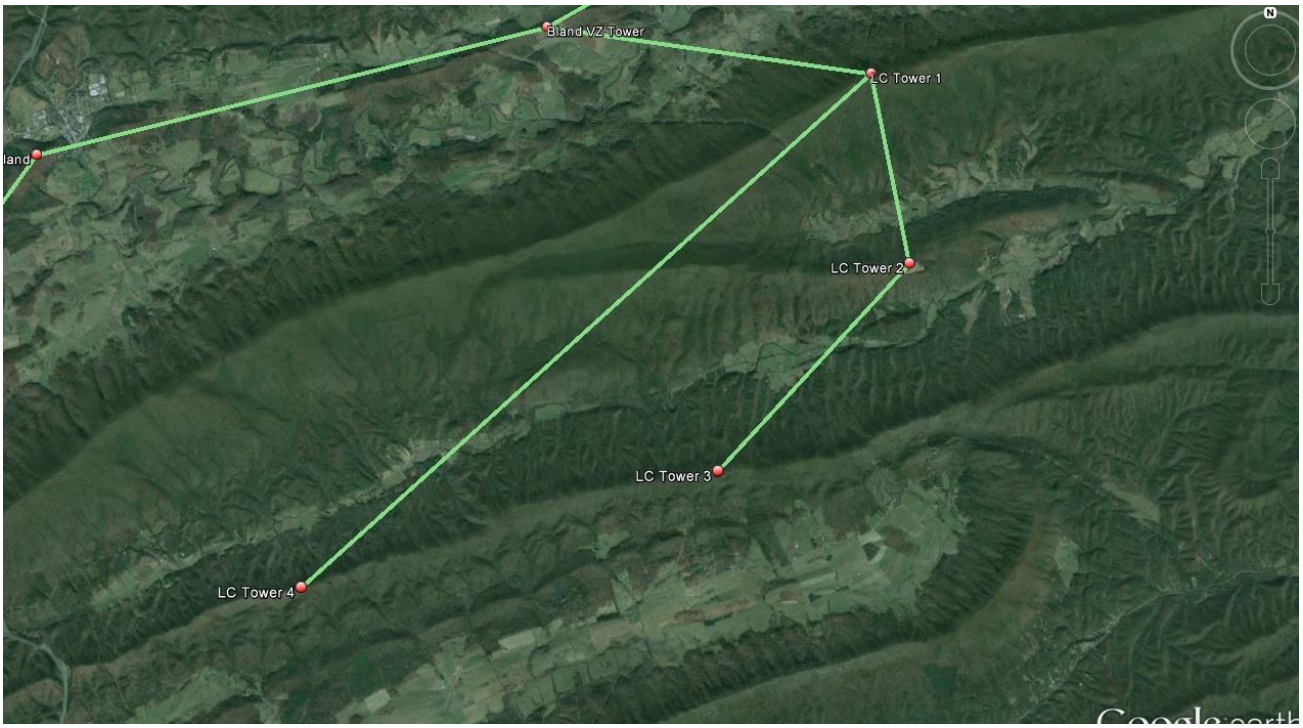
Phase 1-5 Complete Coverage



Phase 6: Little Creek

This area is the most isolated in the County and will require more towers to get coverage. Below is the coverage and backhaul maps:

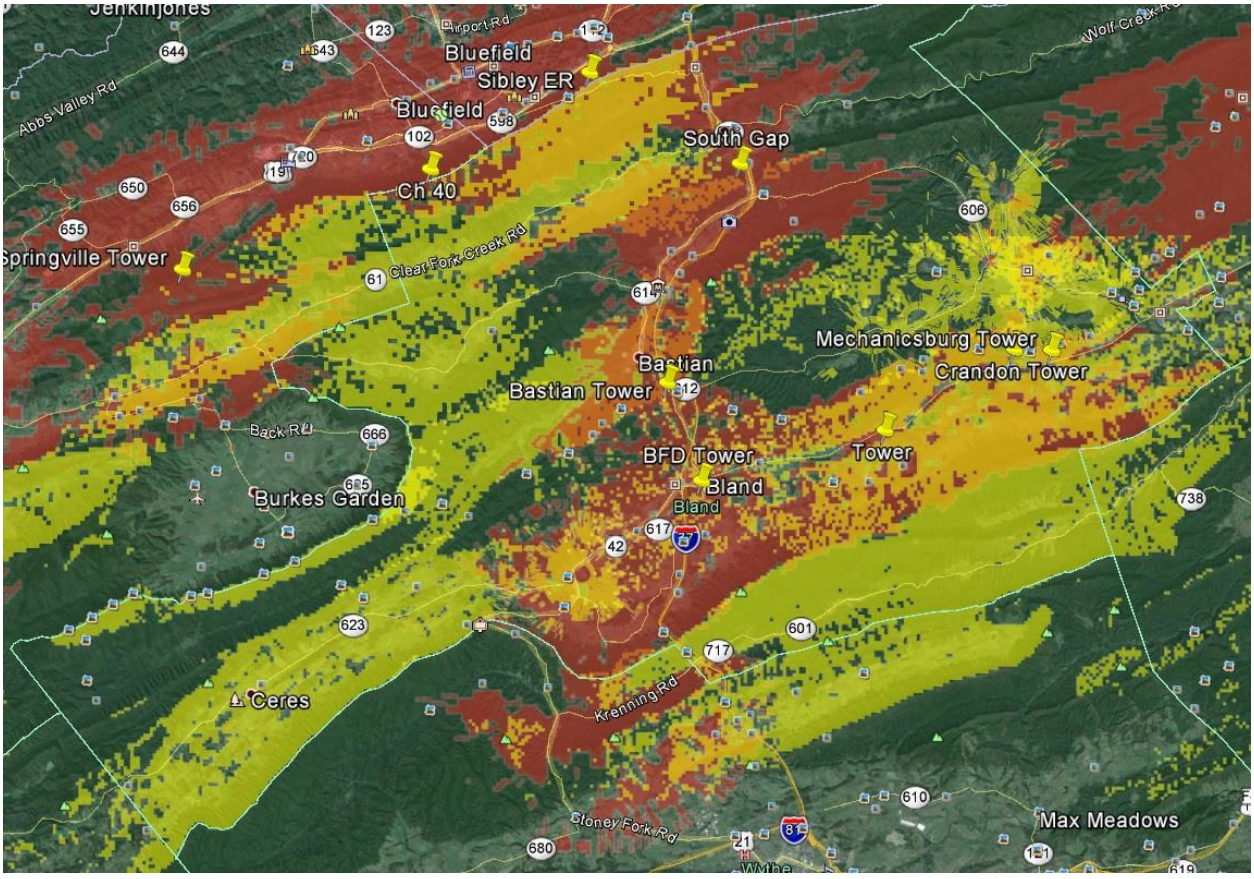




Phase 6 Budget

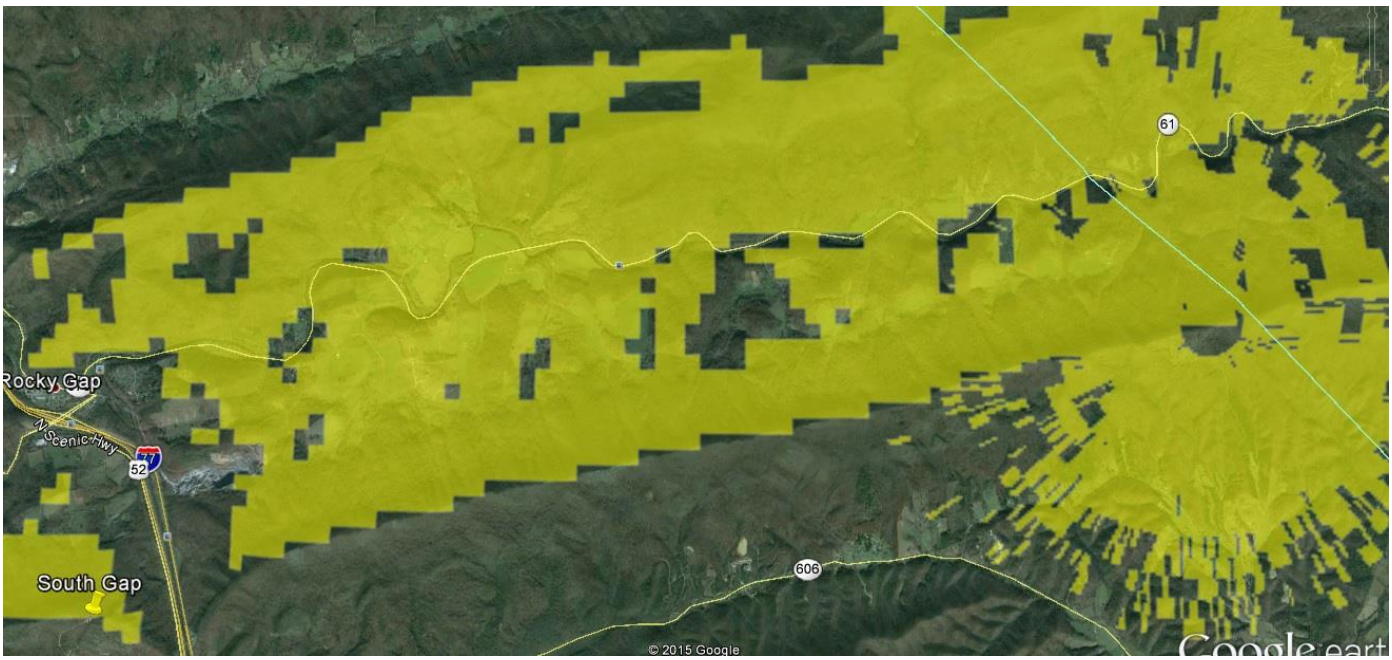
	No of Units	Unit Cost	Total
Electronic Equipment (Backhauls, AP's, Routers, etc)			$12,500
Tower Sites	4	$40,000	$160,000
Customer Premise Equipment	50	$300	$15,000
Buildings (tower sites)	4	$2,500	$10,000
Bandwidth Cost			$10,000
Site Preparation / Labor	4	$10,000	$40,000
Engineering			$5,000
Total			**$252,500**

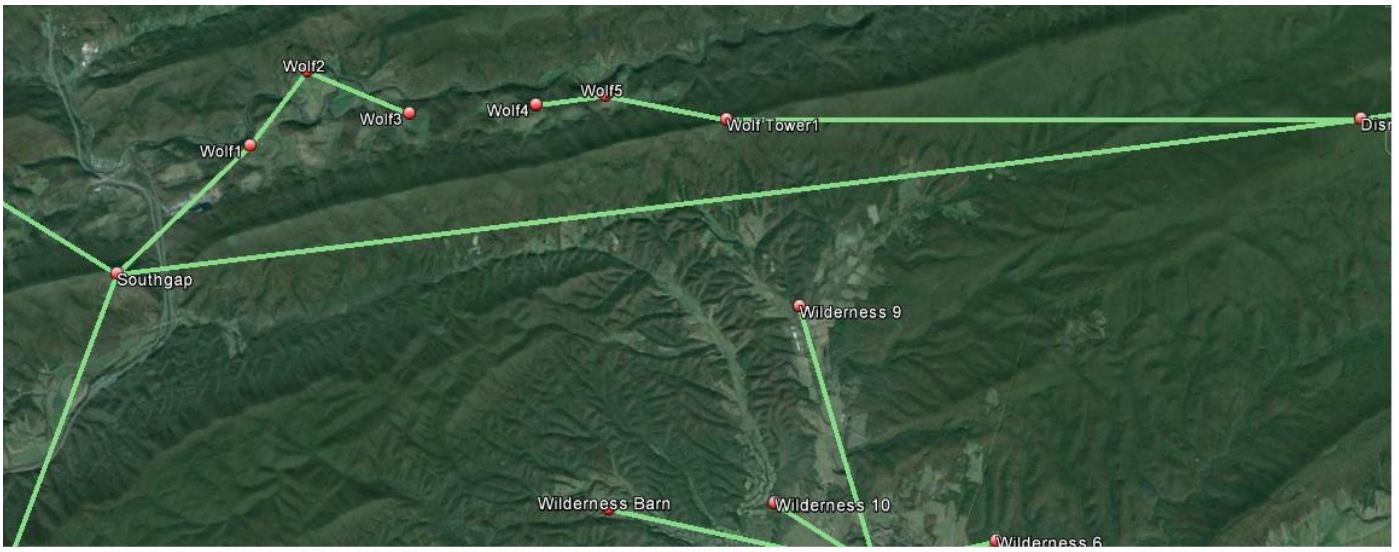
Phase 1-6 Complete Coverage:



Phase 7: Route 61

This valley is also a difficult area to cover due to foliage and how narrow the valley is. Below are the coverage and backhaul maps:

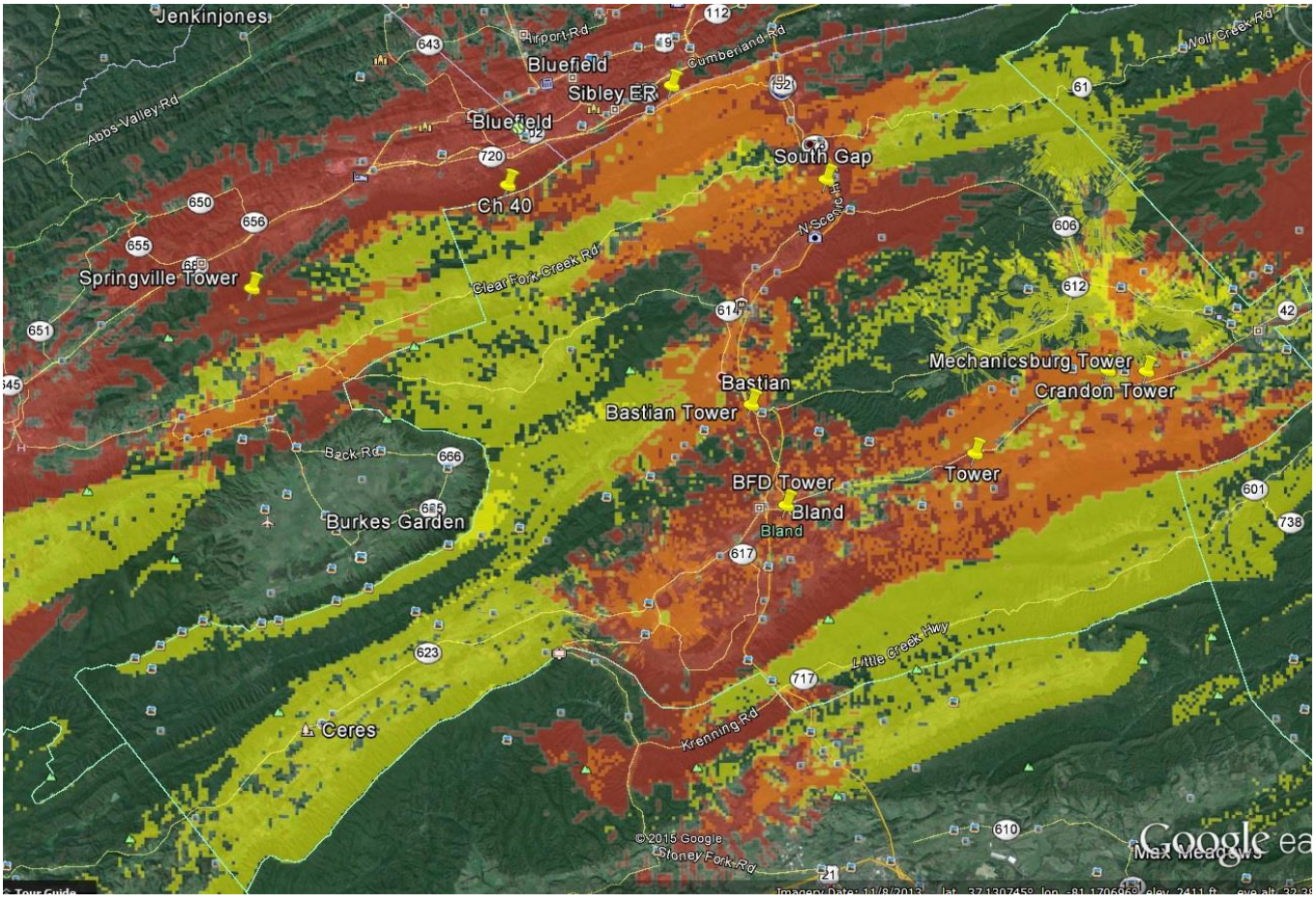




Phase 7 Budget

	No of Units	Unit Cost	Total
Electronic Equipment (Backhauls, AP's, Routers, etc)			$12,500
Tower Sites	1	$40,000	$40,000
Microsites	5	$5,500	$27,500
Customer Premise Equipment	50	$300	$15,000
Buildings (tower sites)	1	$2,500	$2,500
Bandwidth Cost			$10,000
Site Preparation / Labor	6	$2,500	$15,000
Engineering			$2,000
Total			**$124,500**

Phase 1-7 Complete Coverage:



Summary

This plan estimates the cost to cover approximately 90% of Bland County with broadband wireless Internet access. The plan requires 7 phases to complete for an estimated cost of $986,750.00.