Oregon Department of Transportation

State Radio Project

JANUARY 2016

MONTHLY PROGRESS REPORT

Cover photo: In mid-December, a work crew traveled by snowcat to finish setting up a new generator at the Medicine Mountain radio site in Klamath County.

PROJECT AND GOALS UPDATE

Winter weather substantially shut down civil site work on the State Radio Project by the beginning of December, but only after a construction and installation season that exceeded project goals. By the end of the month, work was in place to accommodate the remaining trunked radio system and VHF integration equipment installations and begin testing the new technology as a system.

The project team is organizing the remaining work scheduled for 2016 to meet the June 30 end date for the Major Projects Section's delivery team.

"There is still a fair amount of microwave equipment to install, so if the snowmelt is later than normal, some work may push past our projected end date," said Dick Upton, State Radio Project manager. The ODOT Wireless Communications Section is prepared to finish any work left after the planned project end date.

In addition to finishing civil site work for the winter, the project also began testing the trunked radio system coverage area. Preliminary results indicate that the coverage exceeds trunking system vendor Harris Corp.'s 90 percent guarantee in the "horseshoe" coverage area, which includes the Willamette Valley, north to the Columbia River Gorge, east to The Dalles and south to Bend. The team is now re-evaluating the need for a couple of planned infill trunking sites.

"Based on Harris' level of signal strength testing, it looks like we may not need to add these infill sites," Upton said. We will continue testing and make that determination at a later date. In the meantime, we are preparing for the next stage of trunked system testing in a focused and controlled coverage area within the horseshoe.

Looking ahead to the technology deployment, the biggest remaining hurdle is completing the VHF/trunked radio system integration sites. We need to get the equipment installed, tuned and tested for functionality.

"The plan is to make every effort to get sites that have been approved through site acquisition installed as long as we can travel to them safely," said Phil Roland, Harris senior program manager. "We won't be cutting over any users to the new technology until the weather breaks."

The new consoles and logging recorders continue to operate at all dispatch centers while the team addresses some remaining small glitches. The "confidence testing" period is scheduled through the end of January, and Pantel International staff is working with Wireless technicians, implementing fixes to small issues that arise.

The console system received a major software upgrade in December that added a third audio stream to the instant recall recorder. The upgrade fixes an issue that surfaced during cutover. Operators now have three independent audio streams: they can transmit, hear the radios and hear instant recall recordings all at once. The upgrade involved having a Wireless technician on site at each of the state's six dispatch centers at the same time.

Another fix underway addresses when certain incoming local calls appear as long distance numbers in the console system. The project team is documenting these numbers so that Pantel can make this correction to the system in two stages. The first stage correction happened along with the software upgrade. As numbers come through the system, they are added to the list and will be corrected in the second stage.

During December the radio project team met to determine where the consolettes — a portable version of the console system without the phone capability — need to be installed. The team ordered 24 of the 40 consolettes budgeted and will determine the remaining locations and place the final order in January.

INFRASTRUCTURE

Hamaker Mountain is one of five sites that reached substantial completion in December. Work included a new shelter and improvements to an existing shelter, a new 100-foot tower and removal of the old tower, a new generator, two new propane tanks, a new ice bridge, antenna relocation, and site grounding and electrical work. At Medicine Mountain, crews installed a new shelter, generator and HVAC, made improvements to the existing shelter, installed a new 80-foot tower and removed the existing tower, migrated the antennas, and made electrical and grounding improvements. New equipment at Tillamook Head includes a shelter, ice shield, ice bridge, HVAC unit and propane tank, along with foundation and grounding improvements. The Table Mountain site received a commercial power run, and crews installed a new rain shield at Wilson River.

Notice to proceed was issued for Roman Nose in Douglas County and Murdock ATC in Klickitat County, Wash. Work at Roman Nose includes extensive interior and exterior upgrades to an existing concrete shelter. Murdock ATC work includes automatic transfer switch wiring and grounding improvements.

NARROWBANDING

The radio project met the required Federal Communications Commission mandate to transition to narrowband operations ahead of the November 2013 deadline. Work on several narrowbanding-related items, including antenna installations for select repeater sites and office remote locations and power system upgrades, and construction of a number of infill sites will continue through 2016.

CONSOLIDATION

The radio project goal to consolidate the ODOT and Oregon State Police wireless communications systems into a single unit and allow for shared efficiencies and integration between the existing state systems is complete. OSP staff, communications sites and communications systems were consolidated with ODOT as of July 1, 2013.The work to transfer the OSP sites to ODOT is complete.

INTEROPERABILITY

The interoperability request for proposal remains in legal sufficiency review with the Oregon Department of Justice. When released, it will be available on the Oregon Procurement Information Network.

Following the State Interoperability Executive Council's recommendation in November for interoperability grant funding, in late December DOJ approved for legal sufficiency the Umatilla-Morrow Radio and Data District, Polk County and Deschutes County 9-1-1 Communications District intergovernmental agreements.

PROJECT PROGRESS

The total budget for the radio project is $229,991,920. Less expenditures from the previous biennia and those expended by the Oregon Wireless Interoperability Network program, or OWIN, the remaining budget is $175.1 million.

The work components necessary to launch the revised State Radio Project include project management, narrowbanding, microwave modernization, trunking, tactical interoperability and partner obligations. The budget and schedule for the project's active components are provided in the State Radio Project monthly dashboard; supplemental information in this report is based upon the work breakdown structure detailed in the State Radio Project's Project Management Plan.

WBS 1.0 – PROJECT MANAGEMENT SUMMARY

Project management consists of those elements that are projectwide and affect all other WBS sections.

BUDGET EXPENDITURES

For WBS 1.0 Project Management, 96 percent of the total budget has been expended to date.

ACTIVITIES

ASSET MANAGEMENT

The project deployed microwave equipment for installation at two sites during December. Staff also released equipment to enhance existing narrowband coverage for four sites.

Asset management staff members continue to work with the radio project's Finance and ODOT's Financial Services groups to reconcile site expenditures in preparation for project closeout. Work began on the radio project's annual inventory accounting for 2016.

The asset management team completed its work to move inventory from the radio project's primary inventory space to other ODOT storage locations in Salem, including an outdoor storage space provided by the Wireless Communications Section. The radio project transferred excess warehouse shelving to the Oregon Department of Corrections, which used inmate labor to decommission and transport the materials to its warehouse in Salem.

CHANGE MANAGEMENT

There are two types of change requests, administrative and formal. Administrative changes are those that do not affect the project's baseline scope, schedule or budget. Formal changes are those that affect those project baselines. During December, 10 change requests were processed and approved.

	November 2015	December 2015	Total to date
Administrative	0	1	84
Formal	22	9	600
Total	22	10	684

The following table represents the value of the project's contingency budget at the end of the two most recent months. The change noted is due to approval of formal budget changes executed in December.

	November 2015	December 2015	Total Change
Contingency budget, end-of-month value	$2,581,430	$2,488,526	($92,904)

COMMUNICATIONS MANAGEMENT

Communications staff provided the following project information/materials during December:

- Produced December 2015 Monthly Progress Report
- Produced December 2015 Project Dashboard

- Produced December 2015 Key Project Facts sheet
- Updated project website on Oregon.gov
- Distributed project information notices via GovDelivery
- Provided update on radio project activities to ODOT public affairs staff

QUALITY MANAGEMENT

The following table is a snapshot of the past two Quarterly Project Status and Improvement Reports issued by Public Knowledge.

	Third quarter 2015	Fourth quarter 2015
Overall risk the project will not meet scope, budget or timing goals	Medium	Low
Total number of risks identified during the review period	5	2
Total number of high-rated risks identified during the review period	0	0

In addition to reporting risk findings, Public Knowledge evaluates 35 quality standards each quarter, which are also ranked as high, medium or low risks. The following table is a summation of those ratings.

	Third quarter 2015	Fourth quarter 2015
Standards rated as high risk	0%	0%
Standards rated as moderate risk	71%	37%
Standards rated as low risk	29%	63%

The following table is a snapshot of the issues, categorized by WBS section, managed by the project during December. Project management develops planned actions and target dates for resolving these issues. Until an issue has a target resolution date, it is not included in the planned for resolution count.

	Number of active issues	Number planned for resolution	Total resolved
1.0 Project Management	1	1	0
2.0 Narrowbanding	0	0	0
3.0 Microwave Modernization	1	1	0
4.0 Trunked Radio	6	6	10
5.0 Interoperability	1	1	0
6.0 Partnerships	0	0	0
7.0 Planning and Engineering	0	0	0
Total	**9**	**9**	**10**

WBS 2.0 – NARROWBANDING

The narrowbanding component of the radio project involves two primary work efforts. First is to transition ODOT and OSP radio operations to narrowband mode, which the radio project completed in August 2013 in advance of the revised federal deadline of Nov. 1, 2013. The second effort includes implementing equipment upgrades, beyond those required for narrowband operation, to mountaintop tower sites and office locations throughout the state.

BUDGET EXPENDITURES

For WBS 2.0 Narrowbanding, 98 percent of the total budget has been expended to date.

ACTIVITIES

A small number of antenna installations and power system upgrades remain for infill repeater sites across the state (WBS 2.1).

Base station and remote installations (WBS 2.2) are substantially complete. New antennas for those sites with Harris equipment have been received and are pending installation this winter. Three antenna installations were completed in December.

Radio project work on the mobile and portable deployment (WBS 2.3) is complete.

Asset reconciliation efforts for narrowbanding equipment deployed by the project will become a maintenance activity completed by Wireless staff (WBS 2.1, 2.2 and 2.3).

WBS 3.0 – MICROWAVE MODERNIZATION

The microwave component of the radio project involves replacing old and outdated ODOT and OSP analog microwave with digital microwave and making associated site improvements.

Microwave installation includes the acquisition, installation, implementation and optimization of the new digital microwave radios, antenna dishes, wave guide, routers and ancillary equipment to support both conventional and trunked radio systems.

Network implementation consists of integrating routing, switching and monitoring equipment into the microwave system to move both voice and data messages over the digital microwave system.

Improvements to towers, shelters, power supplies and other facilities required by the upgraded microwave and trunked radio systems are anticipated at most sites. New leases, permits and agreements will be obtained as needed.

The budget for this project component, totaling $51.7 million, is comprised of $19 million for installation, $5.6 million for network implementation, $25.8 million for site work and $1.2 million for wireless infrastructure management system implementation.

BUDGET EXPENDITURES

For WBS 3.0 Microwave Modernization, 78 percent of the total budget has been expended to date.

ACTIVITIES

MICROWAVE INSTALLATION AND IMPLEMENTATION

The project is tracking the implementation of the microwave network in two ways: by individual sites and by individual “hops.” A microwave hop connects two sites to each other. In most cases, a

single site will require equipment sets to support multiple hops. The microwave network is established by connecting the hops together.

The radio project will report a site as microwave installation complete when all equipment needed to support all hops has been installed at the site. The project will report a microwave hop complete when equipment connecting two sites has been installed.

During December, one hop was commissioned. To date, 123 hops have been commissioned and 109 site installations have been completed.

SITE IMPROVEMENTS

The site improvement process includes three phases: pre-design, design and construction.

Pre-design phase: Tasks completed from inception to approval by the Site Review Committee, the project's change review board. Pre-design scoping activities at all sites are complete; however, radio project staff will revisit sites as necessary to address any needs that may arise during the design process.

Design phase: Tasks completed from site planning through acquisition of the site building permit.

Construction phase: Tasks completed from the acquisition of the building permit to the completion of site construction.

During December, four sites reached site acceptance, the completion of the construction phase of work. Construction activities at 58 sites were completed during 2015.

WIRELESS INFRASTRUCTURE MANAGEMENT SYSTEM

The wireless infrastructure management system will provide monitoring, alarming and control capabilities for system components and associated equipment.

Work on the implementation of the WIMS is on hold until later this winter to allow the radio project staff to focus on the remaining site upgrades and microwave and console installations.

WBS 4.0 – TRUNKED RADIO SYSTEM

A trunked radio system is used to maximize available capacity in a two-way radio system. Because not everyone in a group talks at once and radio transmissions are usually short, a trunked computer can assign talk frequencies in a manner that allows multiple groups of users to share a small set of frequencies without hearing each other's conversations. This effectively compresses the voice signals and enhances the capacity of the system.

The trunked system will allow local radio communications between public safety personnel; microwave will distribute those signals over a larger area, enabling distance and interagency communications.

The $27.2 million budget for the trunked radio system includes five primary work efforts: procurement and installation of trunked radio repeaters for $15 million, switches for $2.1 million, dispatch consoles for $4.9 million, testing and training for $3.6 million and VHF integration for $1.6 million.

BUDGET EXPENDITURES

For WBS 4.0 Trunked Radio System, 75 percent of the total budget has been expended to date.

ACTIVITIES

Development of the trunked radio system includes three categories of work: repeater and site control equipment, central trunking switches and dispatch consoles. Section 7.0 Planning and Engineering also includes progress on the design efforts related to the trunked radio system.

Commission of one trunked radio repeater site was completed in December (WBS 4.1), bringing the total installations completed in 2015 to 23 sites. Installation of trunk switches is complete (WBS 4.2). Installation of dispatch console units is complete (WBS 4.3). Staff has established the equipment needs for the consolette installation and continue to finalize the list of sites at which installations will be completed (WBS 4.3).

WBS 5.0 – INTEROPERABILITY

Improvements to state interoperability will be captured in this section. The State Interoperability Executive Council is currently heading statewide planning efforts to develop the overarching plan for interoperability in Oregon. Once the SIEC has finalized its plan, the project will initiate work on this effort. The project budget for this section is $2.3 million.

BUDGET EXPENDITURES

For WBS 5.0 Interoperability, 1 percent of the total budget has been expended to date.

ACTIVITIES

No interoperability activities took place during December.

WBS 6.0 – PARTNERSHIPS

Partnerships were developed between the former OWIN program and local jurisdictions with the intent to reduce costs to both parties. These agreements created interdependency among participants for a functional system. The radio project has identified the partnership groups listed below as including sites that require work to meet the needs associated with these agreements:

- Chemical Stockpile Emergency Preparedness Program (CSEPP) (WBS 6.1.1)
- Lincoln County (WBS 6.1.2)
- North Coast (WBS 6.1.3)
- North Valley (WBS 6.1.4)
- Southwest Seven (WBS 6.1.5)
- Klamath County (WBS 6.1.6)
- Additional partnerships (WBS 6.1.7)

BUDGET EXPENDITURES

For WBS 6.0 Partnerships, 95 percent of the total budget has been expended to date.

ACTIVITIES

OWIN OBLIGATIONS

Partnership work includes the following five phases: agreements, design, construction, microwave installation and obligation complete.

Agreements: Umbrella and supplemental agreements executed in a given region.

Design phase: Tasks completed from site planning through acquisition of the site building permit.

Construction phase: Tasks completed from the acquisition of the building permit to the completion of site construction.

Microwave installation phase: All tasks involved in the installation of microwave equipment, from initiation to completion. Microwave installations may occur during a site's construction phase or after it has been completed.

Obligation complete: All work has been completed and associated quality reviews have been conducted and work approved. Quality reviews include those conducted by the partner(s), Wireless Communications Section technicians and by representatives of OEM.

All partnership work is complete with the exception of Klamath County (WBS 6.1.6). The work in Klamath County is progressing, but weather conditions will extend the anticipated completion to June 2016.

STRATEGIC TECHNOLOGY RESERVE

Activities related to the deployment of the Strategic Technology Reserve (WBS 6.5) are complete. Operations have been transferred to the Wireless Communications Section.

WBS 7.0 – PLANNING & ENGINEERING

The planning and engineering section of the work breakdown includes design and development activities associated with the previous WBS sections.

BUDGET EXPENDITURES

For WBS 7.0 Planning and Engineering, 95 percent of the total budget has been expended.

ACTIVITIES

Statewide planning activities (WBS 7.1) are captured under interoperability design (WBS 7.5).

The project has completed all narrowband planning (WBS 7.2) efforts and has transitioned ODOT and OSP radios to operate in narrowband mode.

The microwave design (WBS 7.3) is considered substantially complete. Small adjustments continue to be made in response to needs identified during the site acquisition and construction processes. Coordination of microwave implementation is well underway.

Development on the radio project's trunked radio system (WBS 7.4) design is complete.

Interoperability design (WBS 7.5) will be accomplished largely by local public safety agencies, in coordination with the project, that are awarded interoperability funds through an application process and approved by the State Interoperability Executive Council.

Partnership development (WBS 7.6) is complete.

WBS 8.0 – INTEGRATION TRAINING

This section of work was developed and incorporated into the project budget during February 2013. It includes limited funding for training activities for Wireless Communications Section technicians and stakeholders. Activities related to integration training began in the third quarter of 2014 and will extend into 2016.

BUDGET EXPENDITURES

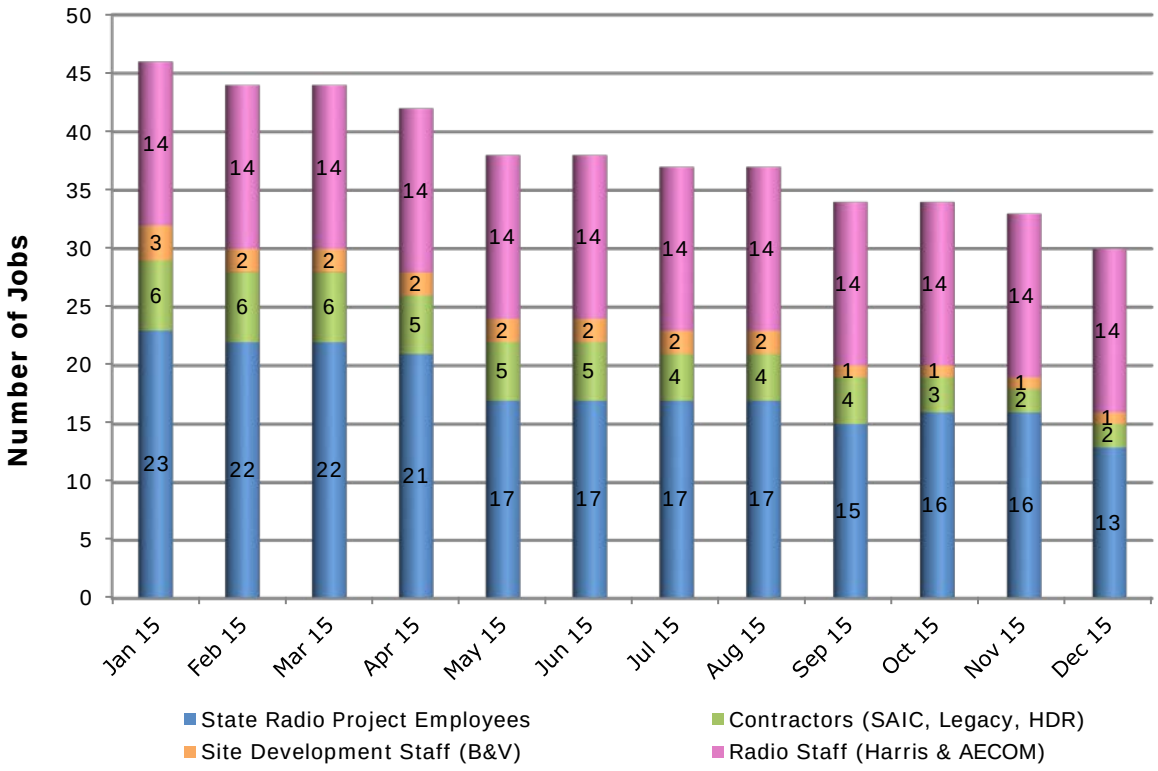
For WBS 8.0 Integration Training, 36 percent of the total budget has been expended to date.

ACTIVITIES

No training activities took place during December.

STAFFING SUMMARY

Full-time state employees and contractors are working on the radio project throughout Oregon. In December, the project employed 13 full-time equivalent state positions.



CONTRACT SUMMARY

Including historic values of the previous OWIN program, the State Radio Project has spent $145,532,889 of the $187,425,869 currently available across the project's 16 contracts. This represents an overall expenditure of approximately 78 percent.

To date in the 2015-2017 biennium, $12,392,345 has been spent. This represents 7 percent of the total contract amount available, meaning the amount authorized on a contract, and approximately 23 percent of the contract amount available for the biennium.

Procurement and finance staff are conducting a year-end quality assurance review of each vendor contract. Some resulting revisions are included in the table below, and all revisions will be included in the February report.

CONTRACT SUMMARY BY VENDOR

	Expended before 06/30/2011	Expended after 06/30/2011	Available balance as of 12/31/2015	Contract amount available
ABN Engineering	-	$580,509	$82,416	$662,925
AECOM	$294,656	$4,740,982	$505,045	$5,540,683
Aviat Networks	$9,456,115	$12,938,629	$9,074,458	$31,469,202
Black & Veatch	$6,168,224	$6,066,104	$11,786,900	$24,021,228
CSGI	$951,175	-	-	$951,175
Federal Engineering	$7,932,754	$703,111	$1,380,972	$10,016,838
General Dynamics	$3,750,794	$6,417,793	$841,644	$11,010,231
Harris Corp.	-	$52,100,142	$6,070,192	$58,170,334
HDR Inc.	$261,091	$3,714,106	$21,766	$3,996,963
JLA Consulting	-	$70,124	-	$70,124
Legacy Wireless	$1,656,972	$4,105,278	$2,532,750	$8,295,000
Misc. small contracts	$1,032,273	$12,267,317	$2,310,476	$15,610,286
OBEC Consulting	-	$141,045	$4,775	$145,820
Pantel International	-	$3,411,840	$2,589,052	$6,000,892
Public Knowledge	-	$1,854,435	$1,009,148	$2,863,582
SAIC Inc.	-	$4,917,200	$3,683,386	$8,600,586
Total	**$31,504,273**	**$114,028,616**	**$41,892,980**	**$187,425,869**
Percentage expended of contract amount available	**17%**	**61%**	**22%**	**--**

PROJECT COST SUMMARY

	Original budget 09/07/2011	Rebaselined budget 09/30/2013	Prior budget changes as of 11/30/2015	Current month budget changes as of 12/31/2015	Current budget as of 12/31/2015	Funds spent through 12/31/2015	Balance as of 12/31/2015
Narrowbanding							
Repeaters	6,100,000	4,415,302	484,163	-	4,899,465	4,792,771	106,694
Office Remotes	2,000,000	2,116,600	(915,549)	-	1,201,051	876,295	324,756
Handhelds/Portables	33,200,000	25,742,427	916,281	-	26,658,708	26,485,658	173,051
Cutover/Testing	-	300,000	(69,295)	-	230,705	230,705	-
Narrowbanding Subtotal	**41,300,000**	**32,574,329**	**415,600**	**-**	**32,989,929**	**32,385,429**	**604,500**
Microwave Modernization							
Purchase & Installation	29,300,000	17,568,049	1,470,072	-	19,038,121	13,641,605	5,396,516
Network	-	5,498,992	109,454	-	5,608,446	5,361,394	247,052
Site Improvements	45,550,000	25,150,000	604,368	92,904	25,847,272	21,061,553	4,785,718
Network Management System	-	1,386,984	(141,984)	-	1,245,000	82,566	1,162,434
Training & Equipment Acquisition	-	500,000	(500,000)	-	-	-	-
Microwave Modernization Subtotal	**74,850,000**	**50,104,025**	**1541,910**	**92,904**	**51,738,839**	**40,147,118**	**11,591,721**
Trunking							
Receivers	5,250,000	14,803,450	245,938	-	15,049,388	13,276,506	1,772,882
Switches	-	2,403,062	(288,813)	-	2,114,249	2,114,248	1
Consoles	1,400,000	3,941,546	992,105	-	4,933,651	3,560,932	1,372,719
Testing & Training	-	4,193,867	(576,250)	-	3,617,617	1,211,826	2,405,792
VHF Integration	-	1,500,000	70,013	-	1,570,013	353,251	1,216,762
Trunking Subtotal	**6,650,000**	**26,841,925**	**442,993**	**-**	**27,284,918**	**20,516,762**	**6,768,156**
Interoperability							
Procurement & Installation	2,300,000	2,300,000	-	-	2,300,000	31,241	2,268,759
Interoperability Subtotal	**2,300,000**	**2,300,000**	**-**	**-**	**2,300,000**	**31,241**	**2,268,759**
Partnerships							
Construction	10,400,000	10,469,802	-	-	10,469,802	9,980,790	489,012
Partnerships Subtotal	**10,400,000**	**10,469,802**	**-**	**-**	**10,469,802**	**9,980,790**	**489,012**
Engineering							
Narrowbanding	1,300,000	1,532,772	285,214	-	1,817,986	1,817,486	500
Microwave Modernization	17,750,000	18,468,867	1,105,367	-	19,574,234	19,438,110	136,115
Trunking	1,850,000	9,299,376	933,376	-	10,232,752	8,754,159	1,478,593
Interoperability	-	3,064,792	(1,690,685)	-	1,374,107	1,374,107	-
Partnerships	-	410,155	(50,321)	-	359,835	359,835	-
Engineering Subtotal	**20,900,000**	**32,775,962**	582,951	**-**	**33,358,913**	**31,743,705**	**1,615,208**
Integration Training							
Integration Training	-	500,000	(350,000)	-	150,000	53,960	96,040
Integration Training Subtotal	**-**	**500,000**	**(350,000)**	**-**	**150,000**	**53,960**	**96,040**
State Radio Project by Phase							
Narrowbanding phase	42,600,000	34,107,101	700,814	-	34,807,915	34,202,915	605,000
Microwave Modernization phase	92,600,000	68,572,892	2,647,277	92,904	71,313,073	59,585,237	11,727,836
Trunking phase	8,500,000	36,141,301	1,376,368	-	37,517,669	29,270,921	8,246,749
Interoperability phase	2,300,000	5,364,792	(1,690,685)	-	3,674,107	1,405,348	2,268,759
Partnerships phase	10,400,000	10,879,957	(50,321)	-	10,829,637	10,340,625	489,012
Integration Training phase	-	500,000	(350,000)	-	150,000	53,690	96,040
Phase Subtotal	**156,400,000**	**155,566,043**	**2,633,454**	**92,904**	**158,292,401**	**134,859,005**	**23,433,396**
Project Management	**-**	**15,069,054**	**(723,269)**	**-**	**14,345,785**	**13,829,583**	**516,202**
Project Contingency Reserve	**-**	**3,852,259**	**(1,270,829)**	**(92,904)**	**2,488,526**	**-**	**2,488,526**
Total State Radio Project	**156,400,000**	**174,487,356**	**639,356**	**-**	**175,126,713**	**148,688,589**	**26,438,124**
Old OWIN Project							
Spending	45,000,000	49,256,733	(639,356)	-	48,617,377	48,617,377	-
Treasury Loan	8,000,000	6,247,831	-	-	6,247,831	6,247,831	-
Total Old OWIN	**53,000,000**	**55,504,564**	**(639,356)**	**-**	**54,865,208**	**54,865,208**	**-**
Grand Total	**209,400,000**	**229,991,920**	**-**	**-**	**229,991,920**	**203,553,796**	**126,438,124**

ESTIMATED PROJECT CASH FLOW