



OCTOBER 2016

MONTHLY PROGRESS REPORT

Cover photo: Crew members from Summit Solutions work to decommission the old tower at Buxton Mountain in Washington County.

After years of planning, the State Radio Project team is systematically cutting over, or transitioning, radio users in the trunked coverage area of the state from the current VHF analog radio system to the new digital trunked radio communications system.

The project team, including vendors, spent years planning the digital upgrade to the trunked radio system and many months refining the integration of three disparate systems — the existing VHF radio system, the new Pantel International console system and the new Harris Corp. trunked system — allowing users seamless operations between all three.

In September, the team's focus remained on testing and adjusting the trunked radio system and working with our cooperators to resume the test period in McMinnville. In mid-July, the project team initiated the cutover in McMinnville, adding a small controlled group of live Oregon Department of Transportation Maintenance crews and Oregon State Police troopers to perform the required confidence test of the new system.

After two weeks of live operations on the trunked radio system, the project team decided to suspend operations to resolve the garbled voice transmissions that surfaced during the live confidence test without continuing to impact daily operations.

The project team spent the next six weeks pinpointing and resolving the cause of the garbled voice transmissions. On Sept. 21, we reinitiated the cutover to the digital trunked radio system in McMinnville and resumed the confidence test period. The cutover went smoothly, and the ODOT and OSP test participants are once again using trunked system operations.

On Sept. 28, the team began to transition ODOT and OSP radio communications systems in the Santiam Pass area along Oregon 22 and U.S. 20 from separate VHF channels to individual simulcast radio systems for each agency in preparation for the next trunked system cutover.

This is the first of several simulcast installations and cutovers that ODOT Wireless Communications Section is installing in areas adjacent to the trunked radio system to bridge the current VHF system with the new digital trunked system. The objective is to have seamless communications between the two systems. The simulcast system allows radio users to use one channel or talk group in areas of the state that are near both VHF and trunked coverage areas.

Weeks of preparations over the summer leading up to the transition involved installing, calibrating and fine-tuning equipment on three radio sites. ODOT and OSP users shared radio systems for several hours while each agency's system went down and the new simulcast system came online. Wireless Section technicians were on location at each affected site and at the dispatch centers and were in constant communication through a conference bridge.

When the simulcast system was up, technicians drove the corridor to test the radio transmission at every milepost using "Harvard sentences" — phonetically balanced sentences that contain the full range of sounds used in everyday speech. The drive test was successful: The simulcast system provided improved voice quality in an area known for spotty coverage and voice transmission.

"The team was concerned that it would be difficult since tuning the simulcast system is more art than science," said Lisa Strader, ODOT State Radio Project assistant manager. "But in reality — because it was thoroughly planned, tested and orchestrated — it seemed easy."

INFRASTRUCTURE

In September, the radio project issued notice to proceed and reached substantial completion for a second solar site at Bald Mountain. A shelter roof at Roman Nose received notice to proceed, and Doherty Slide achieved substantial completion.

Site work continued at four additional sites. Crews performed warranty work at Mount Pisgah, Bureau of Land Management punch-list items at Table Mountain, partner migrations at Applegate Butte, and site expansion and decommissioning at Buxton Mountain. In addition, a radio equipment shelter vendor performed warranty work on multiple shelters at sites statewide.

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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 OSP wireless communications systems into a single unit and allow for shared efficiencies and integration between the existing state systems is complete. OSP operations and maintenance staff, communications sites and communications systems were integrated with ODOT as of July 1, 2013. The work to transfer the OSP sites to ODOT is complete.

INTEROPERABILITY

Work on a survey to identify interoperability opportunities across the state continues. In Oregon, 643 systems meet the State Interoperability Executive Council definition of a radio system. The user group is working to identify which of those systems in Oregon to survey about their interoperability needs.

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, 97 percent of the total budget has been expended to date.

ACTIVITIES

ASSET MANAGEMENT

Asset management staff deployed microwave equipment for nine sites and narrowband equipment for one site. Staff inventoried 28 sites, with technicians from the Wireless Section, in support of project closeout. Staff members continue to work with the radio project's Finance and ODOT's Financial Services groups to reconcile site expenditures.

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 September, 30 change requests were processed and approved.

	August 2016	September 2016	Total to date
Administrative	1	3	95
Formal	14	27	744
Total	15	30	839

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 September.

	August 2016	September 2016	Total Change
Contingency budget, end-of-month value	\$2,087,940	\$1,818,189	(\$269,751)

COMMUNICATIONS MANAGEMENT

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

- Produced September 2016 Monthly Progress Report
- Produced September 2016 Project Dashboard
- Produced September 2016 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

Public Knowledge issued its last quarterly report for the radio project, covering the first quarter of 2016. A lessons learned report, targeted for completion during the third quarter of 2016, will be Public Knowledge’s final task for the project. The following table is a snapshot of the final two Quarterly Project Status and Improvement Reports issued by Public Knowledge.

	Fourth quarter 2015	First quarter 2016
Overall risk the project will not meet scope, budget or timing goals	Low	Low
Total number of risks identified during the review period	2	0
Total number of high-rated risks identified during the review period	0	0

In addition to reporting risk findings, Public Knowledge evaluated 35 quality standards each quarter, which were also ranked as high, medium or low risks. The following table is a summation of those ratings from the final two reports.

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	Fourth quarter 2015	First quarter 2016
Standards rated as high risk	0%	0%
Standards rated as moderate risk	37%	0%
Standards rated as low risk	63%	100%

The following table is a snapshot of the issues, categorized by WBS section, managed by the project during September. 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	2	2	0
2.0 Narrowbanding	0	0	0
3.0 Microwave Modernization	0	0	0
4.0 Trunked Radio	3	3	0
5.0 Interoperability	0	0	0
6.0 Partnerships	0	0	0
7.0 Planning and Engineering	0	0	0
Total	5	5	0

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, 99 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.

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 Communications Section 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 \$51.4 million, is comprised of \$20.2 million for installation, \$5.6 million for network implementation, \$24.3 million for site work and \$1.3 million for wireless infrastructure management system implementation.

BUDGET EXPENDITURES

For WBS 3.0 Microwave Modernization, 89 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.

One hop was commissioned during September, advancing to 96 percent complete all necessary microwave hops for the radio project.

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.

WIRELESS INFRASTRUCTURE MANAGEMENT SYSTEM

The wireless infrastructure management system will provide monitoring, alarming and control capabilities for system components and associated equipment. Wireless Section staff will install WIMS equipment during the winter months, when weather restrictions limit work at other sites.

MONTHLY PROGRESS REPORT**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 \$27.8 million budget for the trunked radio system includes five primary work efforts: procurement and installation of trunked radio repeaters for \$15.4 million, switches for \$2.1 million, dispatch consoles for \$5.0 million, testing and training for \$3.6 million and VHF integration for \$1.7 million.

BUDGET EXPENDITURES

For WBS 4.0 Trunked Radio System, 87 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.

One trunked radio repeater was installed in September (WBS 4.1).

Installation of trunk switches is complete (WBS 4.2).

Installation of dispatch console units is complete (WBS 4.3).

Following the 90-day console system confidence testing period that concluded in September, the console vendor will make minor modifications to enhance system operation and will complete punch-list items (WBS 4.3).

WBS 5.0 – INTEROPERABILITY

The State Interoperability Executive Council led statewide efforts to develop the overarching plan for interoperability in Oregon. The SIEC and the radio project are initiating improvements to state interoperability, including awards to local public safety entities to enhance their radio systems to interoperate more effectively with the state. Other efforts include a survey of existing systems, a report on future interoperability needs and opportunities, and workshops for public safety communications agencies. The project budget for this section is \$2.3 million.

BUDGET EXPENDITURES

For WBS 5.0 Interoperability, 2 percent of the total budget has been expended to date.

ACTIVITIES

Grant-funded interoperability activities continued in September.

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, 98 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 Oregon Office of Emergency Management.

All partnership work is complete with the exception of Klamath County (WBS 6.1.6). Applegate Butte site construction remains substantially complete, with punch-list items and U.S. Forest Service items remaining. Electrical work was completed during September; this will allow remaining tenants to migrate their equipment to the new facility and for the old site to be decommissioned. Pending completion of the Applegate Butte and Swan Lake Point sites, the anticipated completion of Klamath County work is October 2016.

MONTHLY PROGRESS REPORT

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.

OTHER PARTNERSHIPS

Deschutes County 911 partnership work continued in September. The development of network and site designs is progressing, with completion anticipated during October. Staff from Deschutes County and the Wireless Section continues to meet weekly to advance these efforts.

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, 98 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 will 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

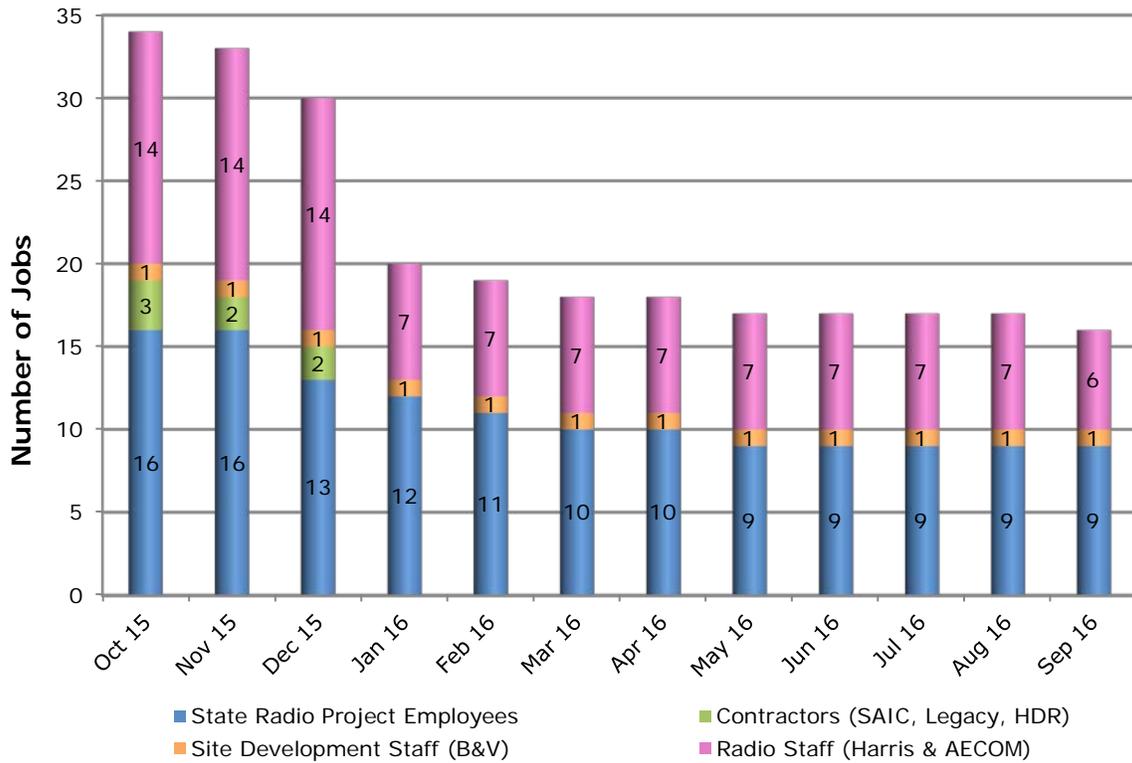
For WBS 8.0 Integration Training, 38 percent of the total budget has been expended to date.

ACTIVITIES

No training activities occurred during September.

STAFFING SUMMARY

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



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CONTRACT SUMMARY

Including historic values of the previous OWIN program, the State Radio Project has spent \$155,919,541 of the \$189,170,990 currently available across the project's 16 contracts. This represents an overall expenditure of approximately 82 percent.

To date in the 2015-2017 biennium, \$22,778,997 has been spent. This represents 12 percent of the total contract amount available, meaning the amount authorized on a contract, and approximately 41 percent of the contract amount available for the biennium.

CONTRACT SUMMARY BY VENDOR

	Expended before 06/30/2011	Expended after 06/30/2011	Available balance as of 09/30/2016	Contract amount available
ABN Engineering	-	\$592,829	\$106,146	\$698,975
AECOM	\$294,656	\$5,114,104	\$131,962	\$5,540,722
Aviat Networks	\$9,456,115	\$15,768,400	\$7,200,579	\$32,425,094
Black & Veatch	\$6,168,224	\$6,113,903	\$11,652,005	\$23,934,132
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.	-	\$55,955,593	\$2,231,454	\$58,187,047
HDR Inc.	\$261,091	\$3,714,106	\$32,766	\$4,007,963
JLA Consulting	-	\$70,124	-	\$70,124
Legacy Wireless	\$1,656,972	\$4,108,360	\$2,529,668	\$8,295,000
Misc. small contracts	\$1,032,492	\$14,109,870	\$1,039,564	\$16,181,926
OBEC Consulting	-	\$141,045	\$4,775	\$145,820
Pantel International	-	\$4,466,236	\$1,775,540	\$6,241,776
Public Knowledge	-	\$1,932,025	\$931,558	\$2,863,582
SAIC Inc.	-	\$5,207,770	\$3,392,816	\$8,600,586
Total	\$31,504,273	\$124,415,268	\$33,251,449	\$189,170,990
Percentage expended of contract amount available	17%	66%	17%	--

PROJECT COST SUMMARY

	Original budget 09/07/2011	Rebaselined budget 09/30/2013	Prior budget changes as of 08/31/2016	Current month budget changes as of 09/30/2016	Current budget as of 09/30/2016	Funds spent through 09/30/2016	Balance as of 09/30/2016
Narrowbanding							
Repeaters	6,100,000	4,415,302	537,147	-	4,952,449	4,869,597	82,852
Office Remotes	2,000,000	2,116,600	(870,549)	-	1,246,051	949,471	296,580
Handhelds/Portables	33,200,000	25,742,427	816,281	(55,368)	26,503,340	26,488,213	15,127
Cutover/Testing	-	300,000	(69,295)	-	230,705	230,705	-
Narrowbanding Subtotal	41,300,000	32,574,329	413,584	(55,368)	32,932,545	32,537,986	394,560
Microwave Modernization							
Purchase & Installation	29,300,000	17,568,049	2,377,919	266,330	20,212,298	17,003,907	3,208,391
Network	-	5,498,992	130,166	-	5,629,158	5,369,664	259,494
Site Improvements	45,550,000	25,150,000	(827,706)	62,270	24,384,564	23,004,678	1,379,885
Network Management System	-	1,386,984	(129,484)	-	1,257,500	425,374	832,126
Training & Equipment Acquisition	-	500,000	(500,000)	-	-	-	-
Microwave Modernization Subtotal	74,850,000	50,104,025	1,050,895	328,600	51,483,519	45,803,624	5,679,896
Trunking							
Receivers	5,250,000	14,803,450	589,138	-	15,392,588	14,532,882	859,706
Switches	-	2,403,062	(288,813)	-	2,114,249	2,114,248	1
Consoles	1,400,000	3,941,546	1,020,605	-	4,962,151	4,382,382	579,769
Testing & Training	-	4,193,867	(576,250)	-	3,617,617	1,717,369	1,900,249
VHF Integration	-	1,500,000	275,900	-	1,775,900	1,631,101	144,799
Trunking Subtotal	6,650,000	26,841,925	1,020,580	-	27,862,505	24,377,982	3,484,523
Interoperability							
Procurement & Installation	2,300,000	2,300,000	-	-	2,300,000	54,162	2,245,838
Interoperability Subtotal	2,300,000	2,300,000	-	-	2,300,000	54,162	2,245,838
Partnerships							
Construction	10,400,000	10,469,802	-	-	10,469,802	10,258,449	184,353
Partnerships Subtotal	10,400,000	10,469,802	-	-	10,469,802	10,258,449	184,353
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	1,510,367	-	19,979,234	19,878,007	101,227
Trunking	1,850,000	9,299,376	933,376	-	10,232,752	9,723,009	509,742
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	987,951	-	33,763,913	33,152,444	611,469
Integration Training							
Integration Training	-	500,000	(350,000)	-	150,000	56,910	93,090
Integration Training Subtotal	-	500,000	(350,000)	-	150,000	56,910	93,090
State Radio Project by Phase							
Narrowbanding phase	42,600,000	34,107,101	698,798	(55,368)	34,750,531	34,355,472	395,060
Microwave Modernization phase	92,600,000	68,572,892	2,561,262	328,600	71,462,753	65,681,631	5,781,123
Trunking phase	8,500,000	36,141,301	1,953,955	-	38,095,256	34,100,992	3,994,265
Interoperability phase	2,300,000	5,364,792	(1,690,685)	-	3,674,107	1,428,270	2,245,838
Partnerships phase	10,400,000	10,879,957	(50,321)	-	10,829,637	10,645,284	184,353
Integration Training phase	-	500,000	(350,000)	-	150,000	56,910	93,090
Phase Subtotal	156,400,000	155,566,043	3,123,010	273,232	158,962,285	146,268,558	12,693,727
Project Management	-	15,069,054	(719,335)	(3,480)	14,346,240	13,982,464	363,776
Project Contingency Reserve	-	3,852,259	(1,764,319)	(269,752)	1,818,189	-	1,818,189
Total State Radio Project	156,400,000	174,487,356	639,356	-	175,126,713	160,251,022	14,875,691
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	215,116,229	14,875,691

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ESTIMATED PROJECT CASH FLOW

