

# RADIO PROJECT STATUS

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## Emergency Communication System Upgrade

C800 Project Leader: John Hartsock

WCCCA Project Leader: Ron Polluconi

C800 Project Manager: Bjorn Morfin

Date: September 17, 2019



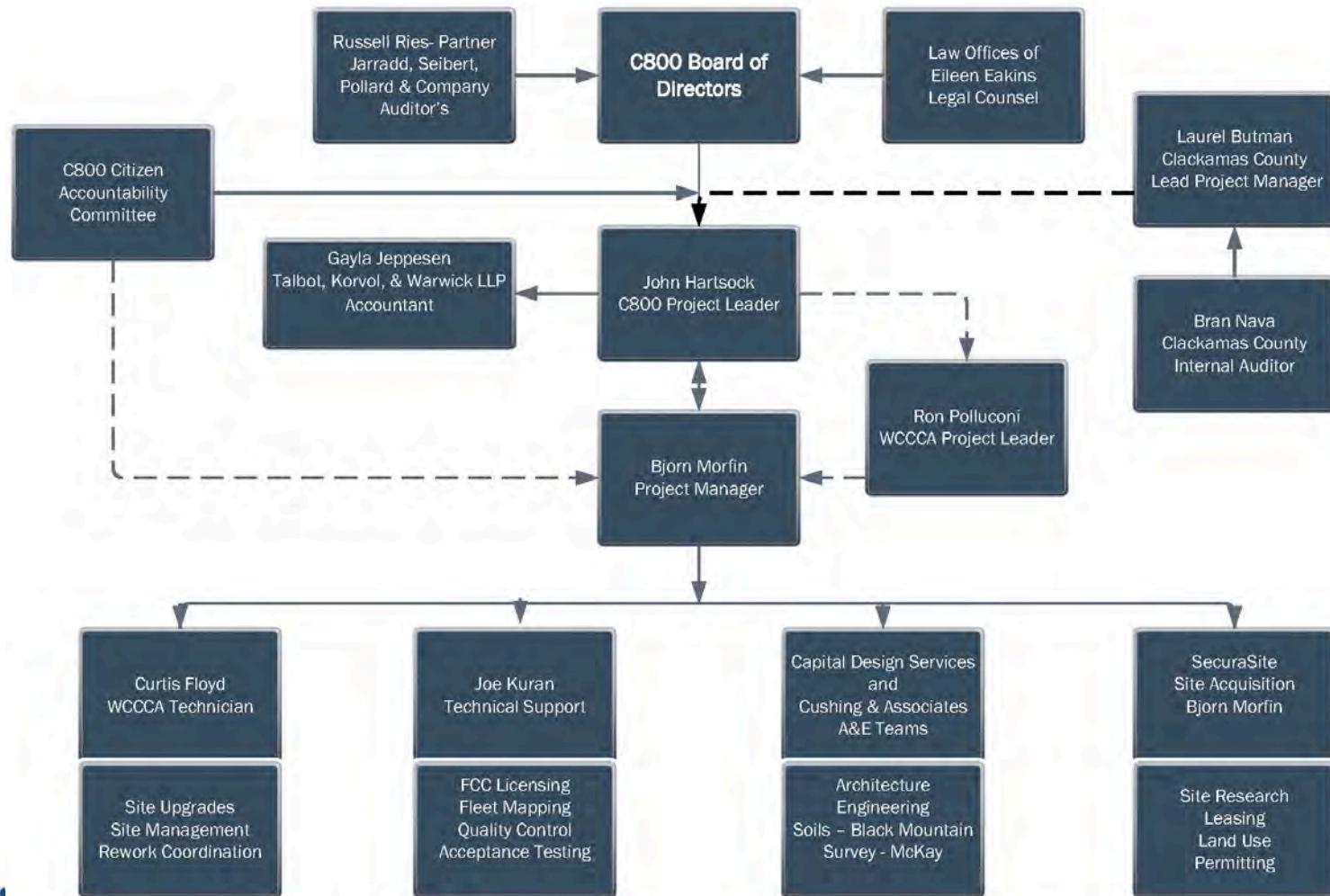
# Resiliency:

## A Primary Objective of the Upgraded System Design

- New Facilities and Towers - Designed to the Oregon Structural Specialty Code: “Essential Facilities” Risk Category IV: i.e., Essential structures in this category are used for communications across non-redundant and hardened networks such as: rescue or disaster operations, and public safety facilities. They are to withstand a magnitude 9 earthquake and continue to operate.
- Existing Facilities and Towers - Upgraded to Meet the Current Essential Facilities Codes. Includes 6 tower replacements / 5 tower upgrades and 11 building foundation upgrades.
- 48V DC Power Systems Combined with Emergency Generators - Having 1,000 gal propane fuel supply to provide up to 4 weeks of back up power.
- Redundant HVAC units to maintain environmental control.



# C800 Project Team



# Project Status New Sites Summary

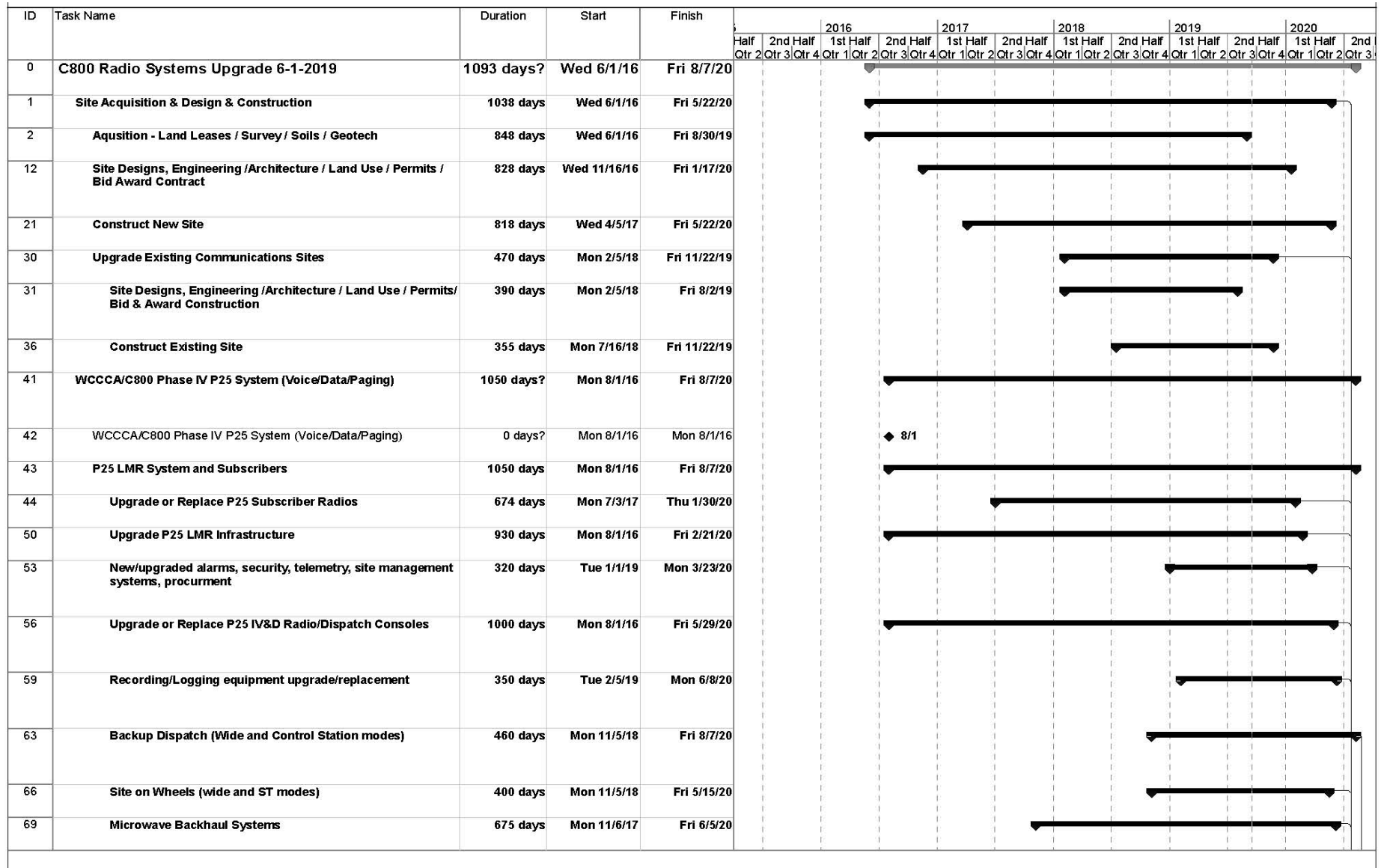
## Fourteen New Sites Acquisition / Design / Construction:

- **Barton:** Construction complete – radio / antenna / 48V battery/ microwave installation complete.
- **Cooks Butte:** Preparing land use submittal including arborist review, sensitive lands review, NEPA, for submittal by early October after the neighborhood meeting on September 18th.
- **Kerr Parkway Water Tank:** We are researching alternative locations.
- **Damascus / Sandy / Canby:** Construction / radio / antenna / 48V battery/ microwave installation complete.
- **Wilsonville:** City has signed lease / permit application submitted and anticipating a permit by September 30, 2019
- **Crutcher Bench (BLM):** Construction complete radio / antenna / 48V battery/ microwave installation complete.
- **Highland Butte (BLM):** Construction to begin in early October finalizing tree sale with BLM and additional NEPA work.
- **Tom Dick & Harry / Memaloose / Whale Head / Oak Grove (USFS):** Construction is underway on Memaloose / Whalehead / Oak Grove – access easement being obtained for TD&H.
- **Hoodland Fire/Brightwood:** Construction is underway anticipating completion by October 4, 2019.

# Project Status Existing Sites Summary

	C800
13 Existing Sites Design / Construction	<ul style="list-style-type: none"> <li>• <b>Brightwood / Lenhart / Mt Scott / Pete's / Polivka:</b> Tower replacement / building foundation upgrades / 48V DC power system / new generator and 1,000 gal fuel tank / new HVAC units. Construction underway anticipate completion of all by mid to late October</li> <li>• <b>Goat Mtn / Mt View / Redland Rd / Sawtell / View Acres:</b> Tower structural upgrades / building foundation upgrades / 48V DC power system / new generator and 1,000 gal fuel tank / new HVAC units. Mt View/Redland/Sawtell/View Acres complete Goat is underway with an anticipated October completion</li> <li>• <b>Day Hill:</b> All work complete radio/antenna/48V battery work complete</li> <li>• <b>Timberline:</b> new generator and 1,000 gal fuel tank to be scheduled</li> <li>• <b>CCOM:</b> New Uninterruptable Power System for Master Site Equipment / revisions to fire suppression system / new cable tray. Work complete.</li> </ul>

# Project Schedule





# Project Schedule

ID	Task Name	Duration	Start	Finish																			
					2016				2017				2018		2019				2020				
					Half 2	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd					
					Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
75	New/Upgrade 48 VDC and Battery Backup Systems	405 days	Mon 9/24/18	Fri 4/10/20																			
80	Paging, Messaging Systems upgrade/replacement	600 days	Mon 2/5/18	Fri 5/22/20																			
89	IP based Fire Station Alerting System	500 days	Mon 6/4/18	Fri 5/1/20																			
96	Video and Security systems	255 days	Mon 6/17/19	Fri 6/5/20																			
103	Interoperable RF Systems and Links	570 days	Mon 6/4/18	Fri 8/7/20																			
110																							
112	System Operational August 7, 2020	0 days	Fri 8/7/20	Fri 8/7/20																			

- New Site Design & Construction complete: May 2020
- Existing Sites Upgrade complete: November 2019
- System Operational Date: August 2020

# C800 Radio System Upgrade Budget <sup>(1)</sup>

Project:	<b>C800 Radio System Upgrade</b>		
Date Original:	10/1/2015	<b>Date Updated: March 1 2018</b>	
Project Manager:	Bjorn Morfin		

Item	Budget	Original Encumbrance	Additional Encumbrance / Change Order	Estimate to Complete	Percent Complete	Estimated Total	(Over) Under Budget	Expended
<b>Soft Cost</b>								
Site Acquisition Consulting - Quest	60,000	30,000	40,000	0	95.81%	70,000	(10,000)	67,069.81
Site Acquisition Consulting / Permits - Securasite	320,000	268,500	50,000	0	65.43%	318,500	1,500	208,397.75
Site Planning A&E - Cushing/Capital	725,000	317,178	312,822	100,000	84.55%	730,000	(5,000)	617,196.63
Geotechnical+13:45 / Environmental Consulting - Black Mtn	250,000	89,100	128,356	30,000	64.63%	247,456	2,544	159,942.65
Survey - McKay	75,000	50,160		20,000	60.40%	70,160	4,840	42,380.00
USFS Land Use Fees	15,000	10,000		30,000	58.89%	40,000	(25,000)	23,554.89
Land Use Fees	25,000	8,379		20,000	29.53%	28,379	(3,379)	8,379.00
Plan Check / Permit Cost	60,000	5,800		50,000	14.45%	55,800	4,200	8,060.39
Printing	2,500			2,500	0.00%	2,500	0	0.00
Bid Advertising	3,500	60		3,400	16.37%	3,460	40	566.48
Materials Testing & Inspection	40,000	1,200	2,500	35,000	6.78%	38,700	1,300	2,623.75
Project Management	300,000	80,000	202,000	25,000	37.51%	307,000	(7,000)	115,157.25
Legal Fees	30,000	12,000	10,000	8,000	42.63%	30,000	0	12,787.60
Licensing	20,000	60,000		5,000	92.44%	65,000	(45,000)	60,089.00
Miscellaneous	30,000	6,800	2,000	4,000	67.66%	12,800	17,200	8,660.88
<b>Sub-Total Soft Cost</b>	<b>1,956,000</b>	<b>939,177</b>	<b>747,678</b>	<b>332,900</b>	<b>66.09%</b>	<b>2,019,755</b>	<b>(63,755)</b>	<b>1,334,866</b>
<b>Construction Cost</b>								
Site Construction	8,895,000	1,641,198		7,253,802	8.16%	8,895,000	0	725,394.93
Buildings	1,350,000	986,718		363,282	27.46%	1,350,000	0	370,756.60
Towers	660,000	511,282		148,718	30.69%	660,000	0	202,544.90
Generator	500,000	428,750		75,000	48.96%	503,750	(3,750)	246,658.00
48VDC	1,065,000			1,065,000	5.99%	1,065,000	0	63,816.00
Lake Oswego Antenna	18,000	17,500	0	0	100.07%	17,500	500	17,511.75
Existing Sites	100,000	6,400		93,600	6.40%	100,000	0	6,400.00
<b>Sub-Total Construction Cost</b>	<b>12,588,000</b>	<b>3,591,848</b>	<b>0</b>	<b>8,999,402</b>	<b>12.97%</b>	<b>12,591,250</b>	<b>(3,250)</b>	<b>1,633,082.18</b>



# C800 Radio System Upgrade Budget (2)

Project:	<b>C800 Radio System Upgrade</b>	
Date Original:	10/1/2015	Date Updated: 9/1/19
Project Manager:	Bjorn Morfin	

Item	Budget	Original Encumbrance	Additional Encumbrance / Change Order	Estimate to Complete	Percent Complete	Estimated Total	(Over) Under Budget	Expended
<b>Equipment Costs</b>								
Simulcast Equipment	20,726,000	\$19,592,515		200,000	72.08%	19,792,515	933,485	14,266,288.02
Paging	373,000	7,523		365,000	8.04%	372,523	477	29,958.31
Subscriber Radios	5,000,000	6,303,129		500,000	49.32%	6,803,129	(1,803,129)	3,355,572.47
Asset Management	119,000			119,000	0.00%	119,000	0	0.00
Post Warranty / System Refresh	5,800,000	5,812,058		0	100.00%	5,812,058	(12,058)	5,812,058.44
Test Equipment	100,000			100,000	0.00%	100,000	0	0.00
Microwave	3,368,000	0	2,349,951	250,000	95.35%	2,599,951	768,049	2,479,087.91
Security System	1,364,000			500,000	0.22%	500,000	864,000	1,079.96
Fire Station Alerting	0	1,509,003		50,000		1,559,003	(1,559,003)	80,717.54
<b>Subtotal Equipment Costs</b>	<b>36,850,000</b>	<b>33,224,228</b>	<b>2,349,951</b>	<b>2,084,000</b>	<b>69.11%</b>	<b>37,658,179</b>	<b>(808,179)</b>	<b>26,024,763</b>
Bond Cost	300,000	290,372		0	111.43%	290,372	9,628	323,547
<b>Subtotal Project Cost</b>	<b>51,594,000</b>	<b>46,460,168</b>	<b>3,813,938</b>	<b>5,641,670</b>	<b>70.05%</b>	<b>55,915,776</b>	<b>(4,321,776)</b>	<b>39,170,637</b>
<b>Additional Proceeds</b>	<b>4,875,000</b>					<b>(4,875,000)</b>	<b>4,875,000</b>	
<b>Adjusted Project Costs</b>	<b>56,469,000</b>	<b>46,460,168</b>	<b>3,813,938</b>	<b>5,641,670</b>	<b>70.05%</b>	<b>51,040,776</b>	<b>553,224</b>	
<b>Contingency</b>	<b>7,406,000</b>			<b>7,406,000</b>	<b>0.00%</b>	<b>7,406,000</b>	<b>0</b>	
<b>Total Project Cost</b>	<b>63,875,000</b>	<b>46,460,168</b>	<b>3,813,938</b>	<b>13,047,670</b>	<b>67.02%</b>	<b>58,446,776</b>	<b>553,224</b>	<b>39,170,637.48</b>

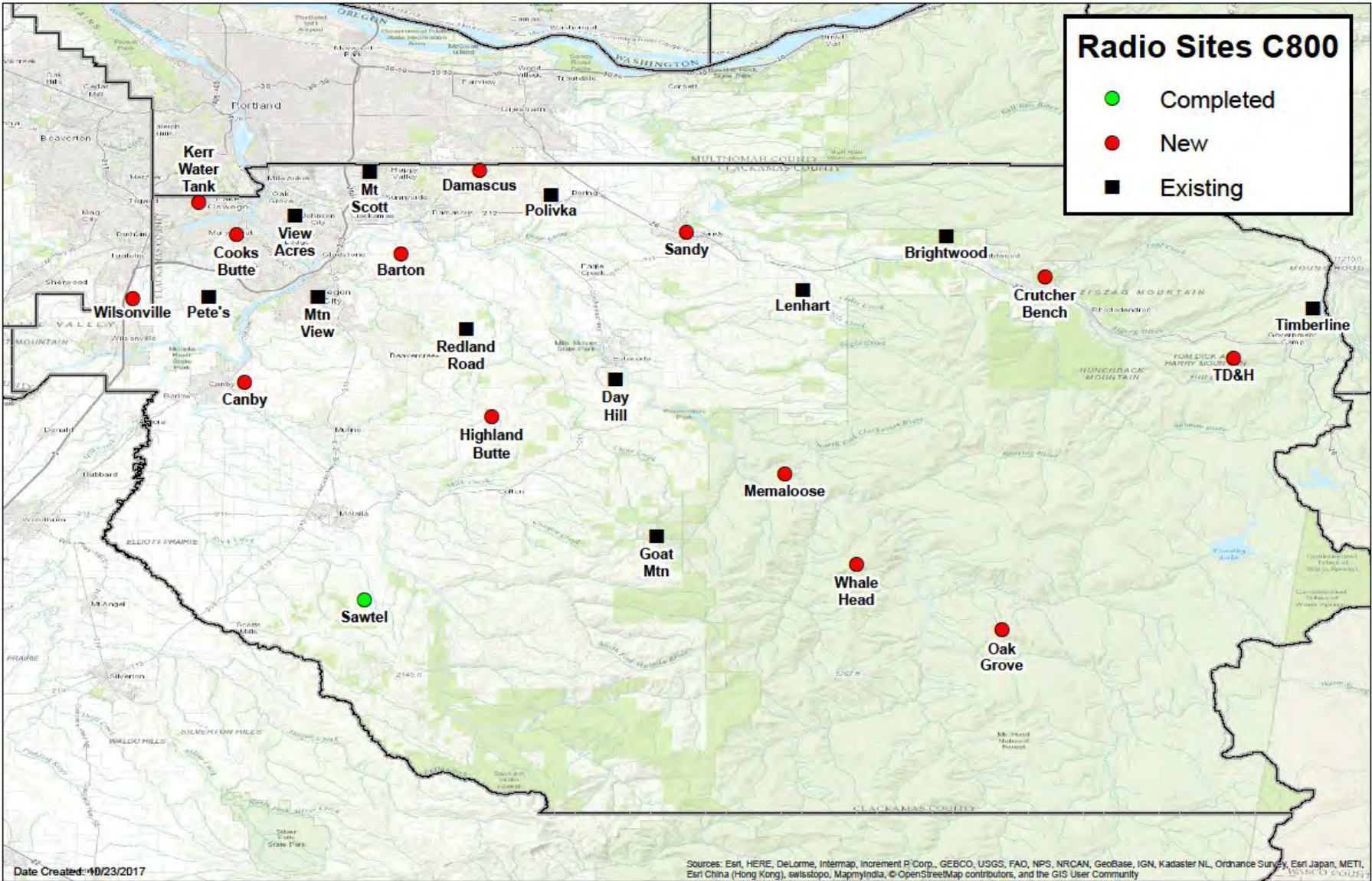
<b>Bond Proceeds</b>	5,845,000	Taxable
	53,155,000	Non Taxable
	<b>59,000,000</b>	
<b>Additional Proceeds</b>	2,200,000	Subscriber Radio Payments
	2,675,000	PGE Payment
	<b>4,875,000</b>	
<b>Total Proceeds</b>	<b>63,875,000</b>	

<b>Premium Bond Proceeds</b>	<b>7,165,794</b>
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# Q4 - 2019 Quarterly Outlook

	<b>C800</b>
<ul style="list-style-type: none"><li>• Procurement</li></ul>	<ul style="list-style-type: none"><li>• Bid and award asset management system</li><li>• Bid and award security/CCTV system</li></ul>
<ul style="list-style-type: none"><li>• Leases &amp; Land Use Applications</li></ul>	<ul style="list-style-type: none"><li>• Complete Cooks land use and submit for building permits</li></ul>
<ul style="list-style-type: none"><li>• Existing Site &amp; Building Upgrades</li></ul>	<ul style="list-style-type: none"><li>• Continue to construct civil work relating to shelter/generator foundation upgrades, doors, electrical, and related site compound renovations.</li><li>• Construct tower upgrades at existing sites</li></ul>
<ul style="list-style-type: none"><li>• Radio / Microwave</li></ul>	<ul style="list-style-type: none"><li>• Continue radio infrastructure install</li><li>• Continue microwave system install</li><li>• Finalize subscriber radio distribution and existing radio upgrades</li></ul>

# C800 Site Locations



# Project Summary:

To create an efficient, dependable public safety radio communications system that works in all parts of Clackamas County!

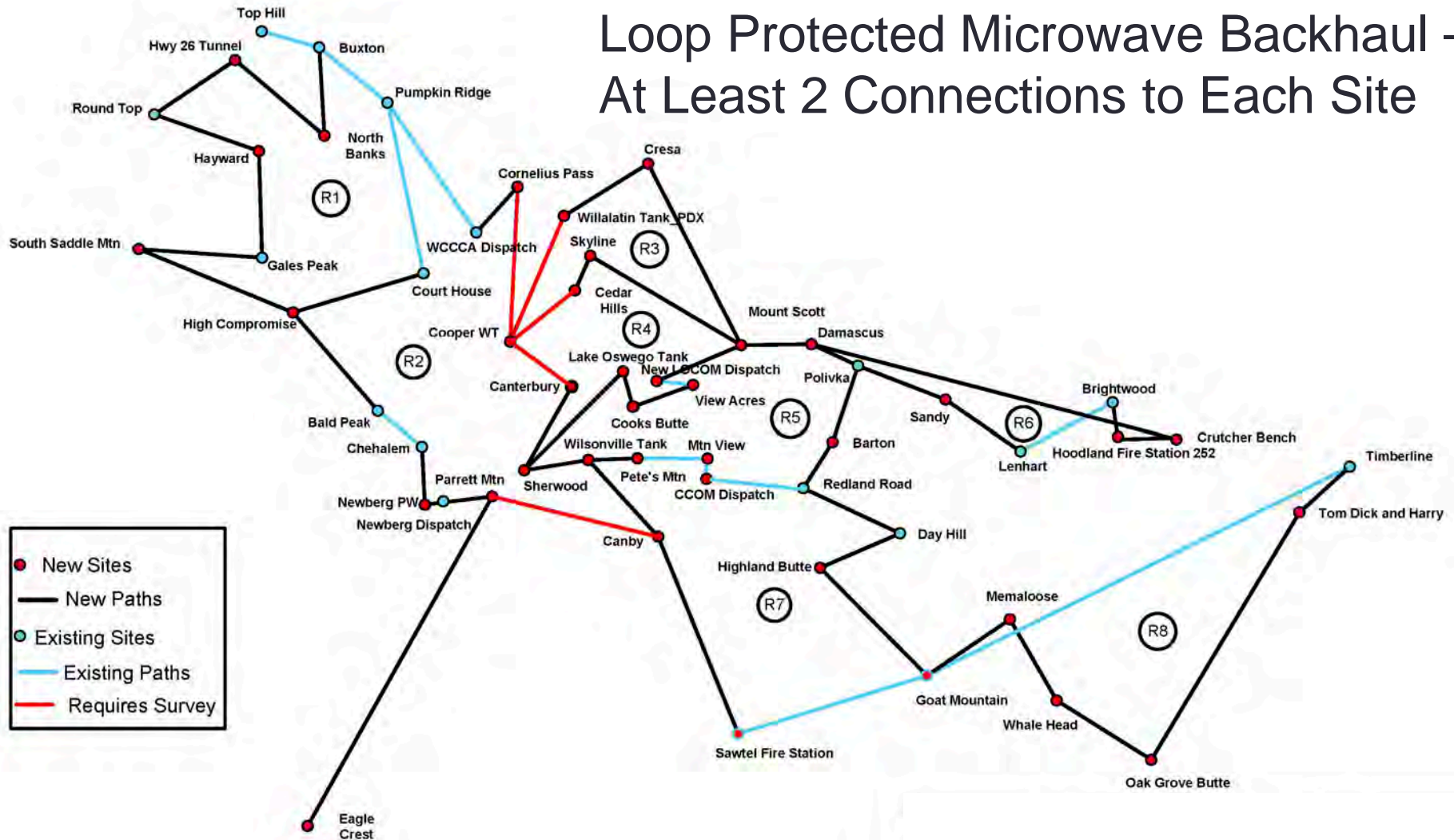
**What's Happening With the  
Communications Upgrade  
Project?**





# Resiliency: A Primary Objective of the Upgraded System Design

Loop Protected Microwave Backhaul –  
At Least 2 Connections to Each Site





Pete's Mtn



Polivka

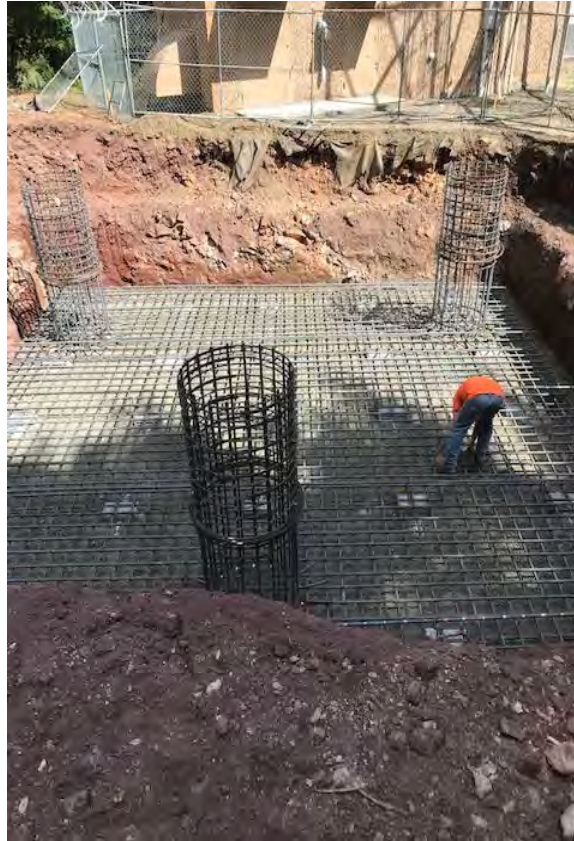


Brightwood





Lenhart



Hoodland





## Goat Mountain





## Whalehead