Project Closeout Report

P25 Narrowband Project

Version 2.0

January 13, 2017

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1 Purpose

The purpose of this document is to provide a record of the P25 Narrowband Project's progress from initiation to conclusion, along with specific information that justified the acceptance of the final deliverable system at the conclusion of the project.

2 Project Background

The Washington State Patrol (WSP) initiated the P25 Narrowband Project to convert existing WSP radio systems to comply with Federal Communication Commission (FCC) rules for narrowbanding. The initial target for the project was to have WSP's radio communications system narrowbanded and compliant no later than December 19, 2014.

The primary project goals of the project were:

1. Comply with the FCC narrowband mandate;
2. Interface WSP's radio system with the U.S. Department of Justice (USDOJ) radio infrastructure (IWN system) through an inter-zone link for shared radio operations
3. Increase operational capability in the Puget Sound region
4. Upgrade WSP's dispatch computer systems
5. Improve WSP's emergency system audio logging systems
6. Prepare the agency for greater radio frequency efficiency by using trunking technology.
7. Accomplish these goals while maintaining service to external users of the WSP system and maintaining current radio coverage to the degree possible.

3 Business Case for the Project

Previously, the WSP VHF communication and dispatch system operated in wide-band (25kHz) analog mode. In this configuration, the "size" of a radio channel was 25 Kilohertz wide. The FCC mandated that all Very High Frequency (VHF) and Ultra High Frequency (UHF) systems operate in narrowband (12.5 kHz) mode effective January 1, 2013, effectively halving the size of the channel.

The WSP initiated the project in 2011 and, after significant progress towards meeting the compliance goal, received an extension from the FCC to August 1,2013. A subsequent extension was granted to December 31, 2014 due to technical issues encountered during the course of the project.

Narrowbanding reduced the size of the radio channel by half, to 12.5 Kilohertz. Licensees (such as WSP) who failed to convert their radio systems to the newer, narrower channels would be subject to fines, sanctions, and possible loss of operating privileges.

WSP determined that narrowing the channel size and remaining in an "analog" mode of operations would result in a significant loss of radio system coverage. This meant that the area of the state in which Troopers could contact their dispatcher or converse with other

Troopers would shrink. Additionally, the FCC announced Phase 2 requirements, where TDMA operations will be required, and two talkpaths will be required along existing channels. Current expectations are that these additional requirements may be enforced seven to ten years after equipment becomes available. This mode of operation is not possible with analog mode systems. The solution to both of these issues is to convert the system to "narrowband-digital" mode.

For these reasons, WSP chose to convert the system from analog to the industry standard "P25" digital mode. Converting to digital meant changes to mountain top base radio stations, vehicle and portable radios, and the microwave system connecting all of the radio sites across the state.

WSP further determined that to gain efficiencies from the limited amount of radio spectrum available to WSP, that the system should also be capable of trunking. Trunking is a technology that uses computers to rapidly assign radio conversations to a radio frequency. This allows frequencies that would see only minimal use under the "conventional" technology to be used much more efficiently. Using a pool of frequencies equally, trunking effectively shares the load of the radio conversations that the system must handle across frequencies, allowing more efficient use of the available spectrum. An agreement with the USDOJ allowed WSP access to the DOJ's trunked system once an interzone link was established, providing a cost-effective expansion of WSP's coverage across the state.

A key aspect of the system included the ability of Troopers to transmit an emergency signal across the system. In life threatening situations, Troopers may not always be able to announce their location so backup can be assigned. With the new system, pressing the Emergency button sends coordinates to dispatch, which will display the Trooper's location along with the emergency alert message. In order to accomplish this increased measure of officer safety, this project included an upgrade to the existing computer aided dispatch (CAD) system.

Finally, the digital system allows for the capture of audio and system state data at unprecedented levels. The data is critical for court cases, dispute resolution, system monitoring, and other tasks. The project included replacing the existing logging systems in use at eight WSP communications centers with a com centralized recording platform accessible throughout the state. This provides WSP with increased recording capacity, expanded information retrieval capability, and enhanced system resilience while lowering training and operational costs.

The Washington State Legislature approved the financing of a $40.1 million-dollar package during the 2011 legislative session for the P25 Narrowband Project. A $10 million funding request for an engineering study, which would precede the P25 Narrowband Project was disapproved by the legislature. The funding was made available on August 1, 2011, which served as the kick-off date for the project. On December 27, 2016, the project was closed out, after 5 years and 4 months of effort.

4 Project Scope

4.1 Initial Project Scope

The initial project scope, as documented in the April 12, 2012 project charter, included the following:

4.1.1 In Scope

All design, engineering, procurement, programming, configuration, installation, testing, acceptance, training, project management, and quality assurance activities for the following systems are in the scope of the project:

- Narrowband (12.5 kHz channel) P25 digital radio system operating in conventional mode or trunking mode where feasible.
- Microwave system upgrades/replacements to include digital and Layer 3 networking capability.
- CAD system upgrade, including GPS coordinate capture and mapping display upon Emergency button activation.
- Radio console replacement.
- Radio and telephony logging recorder replacement.
- Subscriber reprogramming/replacement.
- Facilities upgrades required to comply with system environmental requirements, including Motorola R56 grounding requirements.
- Studies required to facilitate proper and effective system operation, such as fleet mapping, and intermodulation studies.
- Leasing space at existing radio sites to implement the radio system designs where necessary. Existing WSP owned sites are preferred.
- Inter-zone interface to USDOJ radio system.

4.1.2 Out of Scope:

The following items are not in the scope of this project:

- Adding new hires to support the project.
- Including Mobile Office Platform project activities other than project coordination.
- Upgrading or changing any other state or local agency radio system(s) infrastructure unless critical to project success.
- Identifying, acquiring, engineering, or constructing new radio sites unless critical to field operations or project success.
- In-building coverage improvements.

- Including communication devices other than RF voice portables, mobiles, base stations, and related equipment. Cellular telephones, computers, tablets, and other personal communication devices are specifically excluded from this project.

4.2 Scope Growth

Through the course of the project, 49 change requests were processed by the project team, which resulted in the following modifications of the project's scope statement:

4.2.1 Scope Additions

- Conventional testing by Motorola, comparing digital vs. analog coverage from the Gold Mountain site.
- Communications and leadership training for P25 conventional and trunked radio systems
- Convert dispatch console screens to delete, as much as possible, the use of dropdown menus.
- Modify design approach to allow channel markers to be applied to multiple frequencies, to clear channels for use during pursuits and emergency situations.
- Change to the approved fleetmap for the project, to configure tactical talk groups to revert to the first channel in the zone during an emergency, rather than remaining on the tactical talk group.
- Provide alternative antennas for the Sharkee antennas, which were found to provide suboptimal performance under certain circumstances.
- Expanded the training provided as a part of the project to provide refresher training for communications officers working in the district communications centers.
- Integrate District 4 communications with the Spokane County trunked system to provide enhanced coverage and interoperability in the area.
- Provide new transmission sites at:
    - Darrington/Gold Hill (D7) – P25 conventional/digital
    - Minot (D8) – P25 conventional/digital
    - Neilton (D8) – P25 conventional/digital
    - Cosmopolis (D8) – P25 conventional/digital
    - Holy Cross (D8) – P25 conventional/digital
    - Baldy (D6) – P25 conventional/digital
    - Pitcher (D6) – Narrowband analog
    - Kelso (D5) – P25 conventional/digital
    - North Bend (D2) – P25 conventional/digital
    - Maxwell (D1/D8) – 700 megahertz trunked

- Integrate District 1 communications with the Pierce County trunked system to provide enhanced coverage and interoperability in the area.

4.2.2 Scope Deletions

- APX technical training was deleted from project requirements

4.2.3 Scope Delivery

- All approved elements of the project scope were delivered as defined in project change requests and contract amendments.

5 Project Vision

The project's approved vision statement consists of the following:

At project completion, the WSP will be compliant with current FCC narrowbanding mandates and will be staged for the next round of narrowbanding as well. Trooper safety will be increased, and dispatchers will be able to perform their duties more efficiently and effectively. System operations and maintenance will be more efficient and system resource sharing/interoperability will be in place with federal law enforcement and homeland security agencies.

5.1 Project Vision Delivery

Project vision was determined to be successfully fulfilled by the Project Sponsor.

6 Project Objectives

By definition, a project is complete when the project's objectives have been satisfied. Based on the project outcomes reviewed by the project team and project sponsors, the P25 Narrowband Project can be determined to be both complete and successful.

The following is a summary of the objectives identified in the project's charter.

Table 1 Project Objective End of Project Status

Approved Project Objectives	Satisfied Yes/No
1. Identify and complete site readiness tasks for each remote radio site, each dispatch location, and the Master Site location before Master Site cutover.	Yes

Approved Project Objectives	Satisfied Yes/No
2. Upgrade or replace microwave system components to yield a fully digital transport system throughout the state, to include an upgrade to Layer 3 networking capability prior to full project completion.	Yes
3. Reprogram and/or update each base station radio and satellite receiver in the state prior to narrowband implementation.	Yes
4. Reprogram or replace every radio console, mobile, portable, and miscellaneous radio in the WSP to operate in the narrowband, digital mode prior to full system cutover, with this task being completed in each autonomous patrol area (APA) prior to the district cutover.	Yes
5. Convert existing Area frequencies to P25 conventional operation and trunking where feasible throughout Washington State.	Yes
6. Enable system inter-zone configuration with the USDOJ Integrated Wireless Network (IWN) trunked P25 VHF system, and leverage the increased coverage and radio system capability for WSP Troopers in all districts no later than December 31, 2014.	Yes
7. Identify, engineer, install, program, and operate a 700 MHz radio system in the Puget Sound area to improve coverage and increase system capacity prior to project completion.	Yes
8. Identify, engineer, install, program, and operate a new Computer Aided Dispatch (CAD) system at each WSP Communications Center in the state prior to the radio system cutover in each district.	Yes
9. Identify, engineer, install, program and make operational a statewide WSP logging recorder system prior to the first regional radio system cutover.	Yes

6.1 Project Objectives Delivery

All project objectives identified in the detailed project objectives have been satisfied by the project team.

6.2 Project Budget

6.2.1 Budget Plan

The total, initial estimated cost of the project for hardware, software, site improvements, and services was not to exceed $41,100,000, as appropriated and authorized by the Legislature.

This did not include WSP personnel labor, travel, and overtime, which was taken out of the agency operating budget.

The original budget request was for $60,000,000. After working with the Office of Financial Management and the Governor's Office, this was trimmed to what became the authorized budget of $53,100.000, which was further reduced to the $40,109,000 figure once the project received final approval and funding. The final $12 million reduction was as a result of the need to replace mobile and portable radios in the first biennium, rather than during the second biennium. Since WSP could no longer show the need for the mobile and portable radio replacement in the second biennium, WSP removed the request from the second biennium budget after cost efficiencies were found through the USDOJ partnership and favorable contract pricing.

The final budget for the project, including approved change requests and contract amendments was:

Table 2 - Project Funding by Source

Funding Source	Total Budget
Project Budget COP	39,059,000.00
Direct Legislative funding	2,050,000.00
Additional FOB Funding	*300,000.00*
Total Project Budget	41,409,000.00

6.2.2 Project Cost Growth

The following chart describes how the project grew over time, as change requests were developed for the project, and contract amendments were approved for the Motorola contract:

6.2.2.1 Scope Management

- 49 change requests were recorded by the project.
- 29 change requests were approved and completed, with a total estimated value of $1,039,259.
- 17 change requests were cancelled for a variety of reasons.
- 3 were disapproved by sponsor direction.

Table 3 - Change Control Log Summary

CR #	Title	Status	Cost Impact	Schedule Impact	Date Completed
1	Conventional Testing	Completed	$0	None	5/5/2014
2	Text Requirement Deletion	Cancelled	$0	None	2/13/2015
3	Delete APX Tech Subscriber Academy Session Training	Completed	($60,000)	None	6/2/2014
4	Radio Screen Plain Speak Display	Completed	$0	None	7/3/2014
5	Communications Command Training	Completed	$66,360	None	6/2/2014
6	Console Dropdown Menu Elimination	Completed	$228,277	3 months	3/28/2015
7	Interoperability Radio Augmentation	Disapproved	$900,000	None	8/4/2014
8	Channel Markers for Emergency Tones	Completed	$0	None	2/2/2015
9	Fleet Map Changes	Completed	$0	None	7/3/2014
10	Kelso Area Coverage	Completed	$16,000	None	3/20/2015
11	Sharkee Antenna Configuration	Completed	$8,000	None	10/22/2014
12	Academy Console Site Change to Support Disaster Recovery	Disapproved	$0	None	2/2/2015
13	District 2 Trunking Capacity Expansion	Completed	$0	None	7/17/2015
14	P25 Narrow Band Project Historical Reporting Tool Training	Cancelled	$0	None	10/1/2014
15	Console Operator Refresher Training	Completed	$4,300	None	9/18/2014
16	Mobile Front Panel Button Change and Add WB zones to Pilot Codeplug	Completed	$0	None	9/29/2014
17	Console Resource Name Change to Match Radio Channel Names	Cancelled	$0	None	10/20/2014
18	UID Meaningful Information	Disapproved	$0	None	10/20/2014
19	Production Support Resource Requirement	Cancelled	$0	None	5/12/2015

CR #	Title	Status	Cost Impact	Schedule Impact	Date Completed
20	Crescent Bar coverage enhancement	Cancelled	$0	None	2/3/2015
21	Grant County Interoperability	Cancelled	$0	None	11/25/2015
22	Pierce County Interoperability	Cancelled	$0	None	1/13/2015
23	Tacoma Area Repeater	Cancelled	$0	None	3/3/2015
24	Seattle Pass Talk Group Addition	Completed	$0	None	10/17/2014
25	Move the District 2 Prime Site	Cancelled	$0	None	2/3/2015
26	Code Plug Test Augmentation	Completed	$39,635	None	11/20/2014
27	V.24 Link Error Causative Research	Cancelled	$0	None	4/16/2015
28	Console Operator Refresher Training – All District Communications Centers	Cancelled	$21,000	None	3/2/2015
29	Power Upgrade for 700 MHz site Channel Expansion	Completed	$8,625	None	5/21/2015
30	Implement Spokane Area Talk Group for District 4	Completed	$14,102	None	5/22/2015
31	District 2 Site Optimization Analysis and Recommendations	Cancelled	$0	None	5/5/2015
32	Establish recording of analog radio channels with NICE NPX logger at Wenatchee District	Cancelled	$0	None	8/12/2015
33	Document Scope Changes for Project Training	Completed	$0	None	2/16/2016
34	Skokomish and Stevens Pass Base-Repeater Operations Code Plug Change	Completed	$0	None	11/3/2015
35	Project Schedule Modification to Support WSP Operational Needs	Cancelled	$0	30 days	8/26/2015
36	Audio Availability in District and Detachment Offices	Cancelled	$0	None	11/2/2015

CR #	Title	Status	Cost Impact	Schedule Impact	Date Completed
37	New Site Installation Requirements v.4	Completed	$150,403	4 months	12/1/2016
38	Equipment and Limited Services for 3 VHF Transmission Sites	Cancelled	$0	None	11/17/2015
39	Implement Pierce Talk Groups for District 1	Completed	$0	None	2/1/2016
40	P25 Narrowband Project Re-baseline	Completed	$0	5 weeks	2/12/2016
41	700 MHz Trunked Expansion for District 1 and District 8	Completed	$424,893	4 to 7 months	8/19/2016
42	ISSI Connection Establishment	Completed	$42,288	None	12/2/2016
43	Warranty Clarification	Completed	$0	None	2/12/2016
44	Enable SWAT Talkgroup Statewide	Completed	$0	None	2/23/2016
45	Maxwell and Capitol 700 MHz Site Realignment with Pierce County	Cancelled	$0	None	3/3/2016
46	District 8 Holy Cross Transmission Site	Completed	$34,450	3 weeks	4/29/2016
47	MCD5000 with OMC Technical Workshop	Completed	$11,927	None	9/9/2016
48	P25 Narrowband Project Schedule Re-Baseline	Completed	$0	1 month	7/1/2016
49	District 6 New Site Installation Requirements and Consolette Design	Completed	$50,000	None	9/16/2016

6.2.2.2 Contract Management (Amendments)

The following amendments were approved for the Motorola contract:

Table 4 - Contract Amendments (Motorola)

Contract Document	Amendment Total	Contract Total
Original Contract Value	**$28,177,229.35**	**$28,177,229.35**
Contract Amendment 1	$0.00	$28,177,229.35

Contract Document	Amendment Total	Contract Total
Contract Amendment 2	$3,653,270.65	$31,830,500.00
Contract Amendment 3	-$1,327,971.48	$30,502,528.52
Contract Amendment 4	$677,081.48	$31,179,610.00
Contract Amendment 5	$551,006.34	$31,730,616.33
Contract Amendment 6	$0.00	$31,730,616.33
Contract Amendment 7	$126,360.00	$31,856,976.33
Contract Amendment 8	$426,020.84	$32,282,997.17
Contract Amendment 9	$0.00	$32,282,997.17
Contract Amendment 10	$311,050.88	$32,594,048.05
Contract Amendment 11	$0.00	$32,594,048.05
Contract Amendment 12	$4,963.00	$32,599,011.05
Contract Amendment 13	$42,766.17	$32,641,777.22
Contract Amendment 14	$0.00	$32,641,777.22
Contract Amendment 15	$18,310.63	$32,660,087.85
Contract Amendment 16	$15,215.78	$32,675,303.63
Contract Amendment 17	$99,216.75	$32,774,520.37
Contract Amendment 18	$458,460.17	$33,232,980.55
Contract Amendment 19	$0.00	$33,232,980.55
Contract Amendment 20	$162,284.34	$33,395,264.89
Contract Amendment 21	$43,701.04	$33,438,965.93
Contract Amendment 22	$44,181.68	$33,483,147.61
Contract Amendment 23	$0.00	$33,483,147.61
Contract Amendment 24	$37,934.59	$33,521,082.20

6.2.3 Project Costs

Actual costs for the project include the following:

6.2.3.1 Original Project Budget

Table 5 - Orignal Project Budget

Funding Source	Total Budget
Project Budget COP	$39,059,000.00
Direct Legislative Funding	2,050,000.00
Additional FOB Funding	300,000.00
Total Project Budget	$41,409,000.00

6.2.3.2 Budget Performance

Table 6 - Budget Performance Summary

Category of Expense	Total Expense
Total Actual & Projected Expenditures	$41,299,999.68
Balance Available	$109,000.32
Total Project Budget	$41,409,000.00

Total hours expended for the project, not including those consumed for external quality assurance and project management, include:

6.2.3.3 Human Resource Utilization (in hours)

Table 7 - Human Resource Expenditures

CODE	Regular	Overtime	Total
NB0A	38,001	1,755	39,757
NB0ACAD	4,006	341	4,347
NB0ACON	1,449	154	1,603
NB0CORE	2,685	246	2931
NB0ADC	1,616	28	1,645

CODE	Regular	Overtime	Total
NB0AMW	20,662	1,989	22,652
NB0ASITE	4,943	414	5,357
NB0ASUB	25,172	1,594	26,766
NB0ATNG	2,220	133	2,353
TOTALS	100,754	6,654	107,411

7 Project Schedule

The project was initially chartered on April 19, 2012. The project moved forward for a period of time, when it was halted for reassessment and then reconfigured and restarted. The project was re-chartered October 15, 2013 and a new schedule was constructed for moving forward.

The final project milestones were recorded as shown below:

Table 8 - Project Schedule Overview

Task Name	Start	Finish
	11/12/12	NA
Version 1 Schedule Tasks Completed	11/12/12	4/9/15
MPLS Microwave Installations (going forward 10/28/2013)	10/21/13	6/27/14
MASTER SITE COMPLETION	12/15/13	10/31/14
V.24 Link Testing and CR 10 Equipment Installation	4/28/14	10/31/14
District Console Cold Installation	11/12/12	12/14/12
District Cutovers	1/30/14	9/30/16
BELLEVUE D2	6/1/14	12/31/14
YAKIMA D3	1/30/14	3/11/15
VANCOUVER D5	1/10/15	3/27/15
SPOKANE D4	4/7/14	5/25/15
MARYSVILLE D7	6/1/15	10/23/15

Task Name	Start	Finish
BREMERTON D8	9/1/15	4/29/16
TACOMA D1	2/1/16	8/19/16
WENATCHEE D6	1/30/14	9/30/16
FCC COMPLIANCE	10/3/16	10/3/16
Project Closeout	7/5/16	12/27/16
P25 Narrowband Project Complete	NA	12/27/16

8 Production Readiness Assessment

The production support readiness status of the organization is addressed in the following matrix. This assessment is based on information provided by those individuals responsible for each support area within and outside of WSP. The skill sets have been provided through training and tools provided by the vendor and those within WSP. Some exceptions are identified within the server and infrastructure areas, which are identified in the table below.

Table 9 - Production Readiness Assessment Matrix

Item #	Task Description	Status (ready)	Assigned to	Scheduled Ready Date	Actual Ready Date	Action Item/Item Resolution
1	Open project issues transition to Field Services and/or Engineering - outcome is documented	Ready	Dave Pratt, Mark Vetsch, Mike Geiger	11/30/2016	12/15/2016	Complete and handed off to ESD.

Item #	Task Description	Status (ready)	Assigned to	Scheduled Ready Date	Actual Ready Date	Action Item/Item Resolution
2	Production Support Workflow is trained to Communications, Field Service, and Engineering by LMS System Administrator - outcome is documented	Ready	Mark Vetsch & Mike Geiger	10/11/2016	10/11/2016	Processes are in place and working. Administrators are up to speed for microwave. Ron is admin'ing the core and support.
3	Motorola Service Desk is contacted with updated points of contact for WSP	Ready	Ron Gardner	10/11/2016	10/11/2016	Ron has this managed.
4	Communication Centers are briefed on the production support process	Ready	Mark Vetsch		10/11/2016	All is in place.
5	System Manager accepts responsibility for production management, in writing	Ready	Mark Vetsch	11/15/2016	12/5/2016	Signed acceptance 12/5/2016 by Mark Vetsch.
6	System Recovery (Disaster Recovery) Plan is in place and signed by ESD Commander	Post Project Punchlist Item	Bob Schwent	Post-project	Not Applicable	Bob is working with Homeland Security to run tabletop exercises to identify the scenarios at the district and core areas, to be able to develop specific DR plans. This will not be done as a part of the project.
7	System Service Response plan is in place and signed by ESD Commander	Ready	Mark Vetsch	10/11/2016	10/11/2016	Existing processes currently satisfy this need.
8	System Recovery Plan and System Service Response Plans are communicated to Communications Division and FOB	Post Project Punch List Item	Bob Schwent	Post-project	Not Applicable	Bob Schwent will lead an initiative to develop specific plans for the Patrol and each district.

Item #	Task Description	Status (ready)	Assigned to	Scheduled Ready Date	Actual Ready Date	Action Item/Item Resolution
9	Depot repair procedures are documented and signed by Field Service Manager	Ready	Mark Vetsch	10/11/2016	10/11/2016	In place and currently in use.
10	Spare parts inventory is documented	Post Project Punch List Item	Mark Vetsch	Post-project	Not Applicable	Existing spare parts have been delivered to Ron in Yakima, where spare start storage has been set up. Items are being inventoried and included in WebWork. Should be able to process an order for needed spares by the end of November/early December.
11	Service agreements are updated and in place	Ready	Bob Schwent	11/30/2016	10/11/2016	Updated and managed by Bob Schwent.
12	Compliance with R56 standards are validated and the outcome documented	Ready	Mike Geiger	11/30/2016	10/11/2016	Completed for all sites.
13	System quality audit process is defined, including specific, reportable metrics	Post Project Punch List Item	Mark Vetsch, Mike Geiger, Ron Gardner, Bob Schwent	Post-project	Not Applicable	Microwave and networks side of ESD is working these issues. LMR side does not have this defined and in place at this time.
14	Site preventive maintenance checks are updated and status is reported	Ready	Mark Vetsch	10/11/2016	10/11/2016	Baseline has been achieved, based on project site readiness and new installs.

Item #	Task Description	Status (ready)	Assigned to	Scheduled Ready Date	Actual Ready Date	Action Item/Item Resolution
15	Initial quality audit report is provided to, and approved by the ESD Commander	Deleted	Deleted	Deleted	Not Applicable	Deleted by consensus of the project leadership.
16	Production support organizational ready and objectives are defined, documented and distributed to ESD employees.	Ready	Bob Schwent	10/11/2016	10/11/2016	Policies are current and in place.
17	System hardware configuration database set up and baselined	Ready	Mark Vetsch	11/30/2016	12/6/2016	System configuration has been documented in final project and ESD documentation.
18	Code plug configuration database set up and baselined for mobiles, portables and bases	Ready for Trooper Radios; In process for base stations	Mark Vetsch	11/30/2016	11/3/2016	The list of baseline code plugs exists today, in current form. In WebWork, there is a list of each Trooper who has which version of the code plug. This list can be provided to the districts, who can work to get the radios updated. Ron will have Config. mgmt. for base stations in place by the end of the month.
19	Technical library configuration documented and manuals stored for easy access by field service technicians and engineering staff	Ready	Mark Vetsch/Mike Geiger	10/11/2016	10/11/2016	Manuals are stored on SharePoint at this time.

Item #	Task Description	Status (ready)	Assigned to	Scheduled Ready Date	Actual Ready Date	Action Item/Item Resolution
20	LMR user group membership designated, roles and responsibilities are documented and announced	Post Project Punch List Item	Bob Schwent	11/30/2016	Not Applicable	Being organized by Mark Vetsch, to start immediately following the 1st of the year.
21	Quarterly calendar of LMR User Group meetings is set, along with meeting location	Post Project Punch List Item	Bob Schwent	Post-project	Not Applicable	Deferred due to item 20.
22	System Administrator baselines and accepts system databases	Ready	Mark Vetsch	11/30/2016	11/3/2016	All of them were updated by Motorola. Ron will accept admin of those databases, moving forward.
23	Reprogramming procedures are documented for radios and bases	Ready	Mark Vetsch	11/30/2016	11/3/2016	Procedures are documented and have been tested during cutover. Need to define where code plugs are stored.
24	Contract administrator role is established to monitor and maintain records for external service providers	Ready	Bob Schwent	10/11/2016	10/11/2016	Ron Gardner has been installed as the system administrator.
25	Engineering drawings are updated and cataloged for all LMR system sites	Post Project Punch List Item	Mike Geiger	Post-project	Not Applicable	DES Engineering does not have a central repository for engineering documentation for all sites. Mike G has indicated that his team will work on this issue over time.
26	Legacy equipment is retired and processed to State Surplus	Ready	Mark Vetsch	11/30/2016	11/29/2016	Completed by Field Service.

Item #	Task Description	Status (ready)	Assigned to	Scheduled Ready Date	Actual Ready Date	Action Item/Item Resolution
27	System Change Control processes are documented and published to system users and support staff	Post Project Punch List Item	Mark Vetsch	Post-project	Not Applicable	Defined in the Production Support Plan, and to be addressed by ESD in the future.
28	System Configuration Control Board (SCCB) is chartered, membership is identified, roles and responsibilities are set and published	Post Project Punch List Item	Bob Schwent	Post-project	Not Applicable	Refer to item 27.
29	Semi-annual meetings of the SCCB are scheduled, the agenda is set, and the meeting is announced	Post Project Punch List Item	Bob Schwent	Post-project	Not Applicable	Refer to item 27.
30	Preventive Maintenance procedures are documented for LMR equipment	Post Project Punch List Item	Mark Vetsch	Post-project	Not Applicable	Initial PM listing provided to Field Service. Motorola assistance may be requested in the future.
31	Field Service technicians are familiarized with Preventive Maintenance procedures and expectations	Post Project Punch List Item	Mark Vetsch	Post-project	Not Applicable	Mark to develop training matrix to identify required training and track technician training and competence.
32	Production Support Plan for the LMR system is updated	Ready	Dave Pratt	11/30/2016	10/29/2016	Complete and handed off to ESD.
33	Updated Trooper training packages for radio use are distributed to district commanders and WSP Training Division, and Communications Division	Ready	Dave Pratt	10/11/2016	10/11/2016	Note that this is a district training requirement, rather than for ESD technicians. If it is to be changed, it should be run through ESD.

Item #	Task Description	Status (ready)	Assigned to	Scheduled Ready Date	Actual Ready Date	Action Item/Item Resolution
34	Production Support Plan for the LMR system is republished to Bob, Mike and Mark	Ready	Dave Pratt	10/20/2016	10/20/2016	Distributed to Bob, Mike and Mark, as requested.
35	Production Support Readiness is complete	Ready	Bob Schwent	11/30/2016	11/30/2016	11/30/2016
36	Project Team organization is retired	Ready	Dave Pratt/Bob Schwent	11/30/2016	12/8/2016	Retired upon final acceptance of the project by project sponsor.

9 Residual Risks

There were no residual risks identified at the close of the project, related specifically to the projector conduct or outcome. A complete list of the risks identified during the course of the project are included as an appendix to this report.

10 Remaining Issues

Issues identified for the project, which were not fully resolved by the end of the project will be identified, are listed below:

Table 10 - Remaining Issues

ID #	Title	Description	Status	Date Opened	Originator Name	Assigned To
114	IWN Site Balancing in D2	Engineering needs to figure out the best combination of IWN and 700 MHz sites for the trunked system in D2. This needs to be done on a site-by-site basis, and led by engineering. In the absence of Engineering's skill sets, Mark and Ron	Open	9/21/2015	Dave Pratt	Mark Vetsch

ID #	Title	Description	Status	Date Opened	Originator Name	Assigned To
		may be able to modify the IWN profile for D8 to preclude BOA and the busy impact on that district's trunked system.				
122	D7 Lower Stevens Site Receiver	Need to pull the receiver and circuit out of Lower Stevens, if Engineering feels that it is not necessary. Mark is contacting Larry to determine the site status.	Open	9/17/2015	Mark Vetsch	Mark Vetsch
165	Squak Wenatchee and Marysville Check and Configure	As time has permitted, Ron Gardner has been working with Mike and Ed to try to identify some persistent network errors that keep coming up in the Astro system. In the last couple days, Mike has identified that Squak is sending data over the Ethernet that is marked with the wrong QOS tags. Voice is being sent to the system marked for best effort delivery, which makes it more susceptible to jitter or dropped packets. He has also seen Wenatchee and Marysville sending mismarked traffic. Some time ago we had a similar problem with the system and we found out that the QOS markings that had been agreed upon when the system was installed had been changed by Motorola when the zones were connected without WSP being notified. At that time Zone 2 was smaller (fewer sites) and all the equipment on line was using the same marking so it was my suggestion to the project that WSP change the QOS markings on the transport to match what Motorola had changed the Motorola equipment to. We need Squak, Wenatchee and Marysville checked and configured to what the rest of the system is set for. This is a medium risk and	Open	7/20/2016	Ron Gardner	Mark Vetsch

ID #	Title	Description	Status	Date Opened	Originator Name	Assigned To
		should be address in a timely fashion and we should be ok in the short term.				
167	Engineering Data and Drawing Repository	ESD Engineering reportedly does not have a central repository of engineering drawings and information. Mike G. indicated a desire that the repository be developed, and that final documentation from Motorola be collocated with this information. This is clearly out of scope for the project, and remains an open, post-project issue.	Open	11/28/2016	Dave Pratt, Mike Geiger	Mike Geiger
168	Production Support Spares	Spares have been consumed during the course of the project. Remaining spares have been moved to Yakima, under Ron Gardner's control. An order needs to be placed for additional spares, once the existing supplies have been inventoried and funding is available.	Open	11/28/2016	Mark Vetsch	Ron Gardner
169	ISSI Configuration	The two encrypted talkgroups PC LE 11 and PC L/F 15 need to have their WSP talkgroup capability profiles updated for their WSP security groups. In testing, the WSP portable to Pierce portable and MCC7500 participated in secure calls, which proved the ISSI technology. However, on the WSP MCC7500 screen we could see the transmission but lacked the secure key set-up for that to work.	Open	12/5/2016	Randy Covert	Mark Vetsch, Ron Gardner

11 Future Roadmap

The future roadmap, which is provided below, is based on change requests, meeting notes and comments provided by system users and managers that were deferred based on the project's current funding profile, and other priorities of need.

Table 11 - Future Roadmap Considerations

Topic	Description	Notes
Expand WSP 700 MHz Trunked System Across the State	With the success of the 700 MHz trunked system in Bellevue, Marysville and Tacoma, the expansion of the system down the I-5 corridor, and across the state along I-90 would be a logical extension of the system. This would enable Troopers across the state, on major interstates to fully integrate their communications, and provide a valuable tool for public safety and Trooper safety.	This topic is currently being addressed by management.
Production Support Resource Requirement	The goal of this change request is to estimate the cost of acquiring a system manager resource, to augment the WSP system administrator capabilities required to support the P25 Narrow Band Project technical solutions for WSP's districts, across the state. The objective of this change request is to resolve that point of failure issue during the critical, work-intensive period of time when the project is in production in some districts, and in development and implementation (project mode) in others, effectively doubling the resource's work responsibilities. This requirement is on hold due to lack of funding, but identified as a project risk.	The complexity of the LMR system requires more than one system administrator. The tasks required of the system administrator are expansive and well beyond the capacity of the single, current individual filling that position.
District 2 Site Optimization Analysis and Recommendations	The goal of this change request is to acquire the services of the P25 Narrowband Project vendor, Motorola, to leverage their understanding of the district's existing 700 MHz and DOJ/IWN trunked system, to develop a plan that optimizes the use of those sites and additional IWN sites that are available to the district. The objectives of this change requests include: 1. Optimize the coverage provided to District 2 Troopers and others through use of the best possible mix of 700 MHz and IWN sites available to support communications in the district. 2. Specific recommendations that address site coverage benefits and interdependencies, configuration requirements, procedures and processes for implementing those recommendations, and risks associated with making the recommended changes.	The IWN system provides a significant capability to WSP, through its integration with the 700 MHz trunked system. However, the differences in technology between the IWN and WSP trunked system, and the capacity limitations of the IWN system in the King County area, may have created impacts in specific areas. Through the use of subject matter experts, it may be possible to optimize the inclusion of the IWN sites in the WSP system, and then implement that optimization plan,

Topic	Description	Notes
	3. Provide documentation that identifies the approach used to complete the analysis and develop the recommendations, which can serve as a template for future analyses carried out by WSP resources.	eliminating certain IWN sites which drag down overall system capacity.
Audio Availability in District and Detachment Offices	The goal of this change request is to secure the design and implementation of a solution to provide audio monitoring of WSP's radio systems in district squad rooms or detachment offices.	ESD Engineering and ITD continue to work this issue. This is an urgent need for the districts and requires prioritization.
Interoperability Radio Augmentation	Current plans for the P25 Narrow Band Project include a single mobile radio to be installed in each State Patrol vehicle, with the ability to utilize P25 Conventional and Trunking narrow band capabilities. While in trunking mode, those radios are incapable of monitoring local frequencies to support interoperability requirements with local jurisdictions. Many of the districts feel that the lack of this capability threatens their ability to support operations in their direct areas and requires remediation. The goal of this change request is to document this issue and estimate the cost of remediation. This has been escalated to the Executive Project Sponsors for consideration.	The technology exists to provide a single head, dual radio configuration for WSP Troopers, so that it would be possible to monitor both trunked and conventional systems on the same radio head. This configuration is very expensive, but would provide a viable alternative to the existing, limited situation.
Maxwell and Capitol 700 MHz Site Realignment with Pierce County	The goal of this change request is to investigate and potentially implement a change in the WSP 700 MHz trunked system, to realign the Capitol Peak and new Maxwell 700 MHz trunked sites with the Pierce County & Pierce Transit trunked system, and interface that system with WSP's own system. The objective or value provided by this change would be elegant, seamless communications for District 1 and District 8 resources across the districts, and expanded coverage for WSP Troopers.	Integration of Maxwell and Capitol in the Pierce County system is viewed as a significant, potential benefit for WSP, enhancing coverage significantly across multiple districts but may present other operational impacts.
P25 Narrow Band Project Historical	The goal of this change request is to increase the scope of the P25 Narrow Band Project to add training for specific Communications	As WSP matures its relationship with the LMR system, and Communications

Topic	Description	Notes
Reporting Tool Training	Division and Electronic Services Division personnel, so that they can take advantage of Motorola's Historical Report too, provided as part of the P25 Narrow Band Project. Current plans include providing familiarity with this tool to only a single individual (Ron Gardner) on an informal, as needed basis. Communications indicated that they did not require additional reports.	and ESD move toward metrics as a form of system monitoring, this report may take on additional importance beyond that of the system administrator.
Move the District 2 Prime Site	ESD Engineering has assessed the available sites to move the Prime Site in question to a more robust location therefor improving reliability of the 700 MHz Simulcast Cell 1 of the WSP system. It is our recommendation to move the Prime equipment to the Bothell 700 MHz site from Cougar Mt. Adequate power, HVAC, and most importantly East and West bound MPLS MW connectivity is available. We are requesting that Motorola assess the impacts to the project for further discussion.	WSP Engineering feels this move would optimize system functionality and reliability for D2.

12 Project Archives

All project documentation has been archived in the WSP SharePoint site entitled P25 Narrowband Project. That site is managed by the System Manager.

13 Conclusions

The P25 Narrowband Project, after almost 5 years of effort, has been successfully completed. WSP is in compliance with FCC Narrowbanding rules. Coverage has been documented for each district for the trunked system and for conventional narrowband analog and digital radio, where appropriate. Acceptance of the system is generally good in all districts, although it is universally felt that coverage can and should be improved, both for mobile and portable radio use.

Several issues remain outstanding from the project, but which were determined to be out of scope. Those include the establishment of transmission sites at Tiger East and Baldy. Additionally, the consolidation of engineering documentation should be addressed as a priority, so that the as-built documentation provided by this project's vendor can be made available in a reliable manner, in the future.

Beyond those few remaining items, the project's deliverables were provided by the vendor and internal WSP team members, and were accepted by WSP, and the project has been closed.

14 Recognition

The following lists of individuals contributed to the success of this project. The list provided above was constructed as thoroughly as possible. There was no intent to exclude any individual by design. Those inadvertently overlooked and not mentioned in this section of the report should be acknowledged for their efforts, no matter how extensive or long-term they were, for it all contributed to the project's final outcome.

14.1 WSP Executive Project Sponsors

Assistant Chief Marc Lamoreaux

Assistant Chief Jeff Sass

Chief Technology Officer Tom Wallace

14.2 WSP Project Sponsor

Robert Schwent (ESD)

14.3 Project Managers

Dave Pratt – WSP

Randy Covert – Motorola (Final)

Blair Vincent – Motorola (Initial)

Filantres, Gust J – Motorola (Contiguous)

14.4 External Quality Assurance

Joe Blaschka

14.5 WSP Project Team Members

Vetsch, Mark (Technical Lead)
Geiger Sr., Mike (Technical Lead)
Annis, Kerry
Braaten, Mark
Brosman, Tom
Burress, Kirk
Carlson, Michael
Connolly, Wm
Felch, Eric
Gardiner, Ron
Haag, Jess
Halusek, Tom
Hern, Dayrl
Huisingh, Rich
Lane, Bruce
Leimkuhler, Glen
Lewis, Robert
Lyon, Edward
Miller, Scott
Moore, Larry
Ramsey, Robert
Rhinehart, Kermit
Robinson, Randy
Rosario, Steve A
Schmierer, Jay
Sevin, Donald
Staples, Mike
Stone, Mark
Thorsell, Jerry
Whitesell, Lynn
Woodcock, John L.
Studyvin, Robert
Schoonmaker, Eric

14.6 Motorola Project Team Members

Burdett, Christina J
Colville, James D
Cole, Douglas F
Daniel, Robert J
Dhiman, Ravinder
Feikert, Gary J
Fielder, Steven R
(Project Managser)
Forester, David B
Fraley, Mackenzie C
Gilliland, Daniel L
Hansen, Landon N
Hasenbeck, Charlie H
Hester, Mark
Hoffman, Ross M
House, Robert (Project Engineer)
Johnson, David L
Mangus, Charles I
Michaels, Alan M
Morris, Joseph S
Northern, Douglas C
Poffenbarger, William C
Raman, Usha
Roark, Richard (Project Engineer)
Steiner, Bradly J
Thome, Criag
Tillmann, Thomas, J
Wood, Brian D
Townley, Michael J
Woolley, Cleveland B
Young, Lawrence G
Young, Larry A
Young, Kerry
Yount, Bobby M

Appendix A –Lessons Learned

This appendix will provide a detailed listing of the Lessons Learned gathered throughout the course of the project. In this section, approaches and tools that were identified as having worked very well will be validated for future use, and areas for quality improvement will be identified, along with recommendations for implementation.

Information will be gathered for this report from multiple sources:

1. Risk Management Log
2. Issue Management Log
3. External Quality Assurance Reports
4. 2-hour Lessons Learned Workshop, facilitated for project team members and stakeholders
5. Project Sponsor and Stakeholder Exit Interviews

The format of this appendix will be a table in the following general format:

Table 12 - Lessons Learned

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
APX Log Reports	The importance of the APX logs is emphasized to the District Leadership early. Even with the importance of the APX logs stressed, even more emphasis should be added.	Form an informal working group of all districts technology lieutenants before the project begins. Conference calls should be made every 2 to 4 weeks with the lessons learned given by the district LTs as they undergo cutover. This should allow the pending district to better prepare and learn from the initial lessons as well as know what to expect as the troopers use and experiment with the new systems.
APX Log Reports	APX Log reports provide good information for the district.	As of March 18th, District Commanders and District Technology Lieutenants were directed to review each APX Log comment for their district. This direction was discussed with the inclusion of the district communications staff. Our lesson/direction will also include a review of each APX Log Report by

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
		communications to include testing of the user/equipment/system at or as soon as practical in the same problem area. The small number of APX Log Reports generated in the district affords us the ability to immediately address the issue or problem to seek a solution or remedy. After receiving the review from communications, the District Technology Lieutenant will discuss the reported APX Log Report with the trooper/sergeant
Base Station Backup on Hand at Site	Technicians sent to convert sites should have the necessary spare equipment with them on site. This did not happen during the D7 cutover and resulted in confusion and delays ag team members.	Ensure that a spare GPW and GTR, and other spare parts are on hand for cutover. This is a technical supervisor responsibility.
Base Station Code Plug Archiving	Archive base station code plugs when connecting to the station to avoid IP conflicts causing us to program the wrong station.	Need to archive base stations during cutover.
Base Station Code Plug Configuration Management	As part of the site testing process, one of the technicians used his portable to test Sobieski. When his portable would not connect to the site, on his own initiative, he modified the station's code plug's NAC, so that his portable would connect. The change in code plug was not approved and resulted in the site's code plug departing from the approved baseline, without any knowledge of the change by the project team, or the code plug configuration manager. The portable, it turned out, had the wrong code plug in it, and so the change was not appropriate, even if not approved. Team members had to be	Ensure that all technicians understand that code plugs are carefully, specifically managed. Changes to the code plugs must be approved through the project management team, managed by the code plug project manager and not changed without prior approval.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	dispatched to the site to reinstall the approved code plug.	
Busies on Patched Resources	When IWN goes busy, VHF conventional resources patched to IWN trunking may be affected.	Dispatch can mitigate this by de-keying when they hear the busy sound and wait to re-try.
Cabling Configuration Confirmation	In two cases, communications with sites failed as a result of incorrect cabling in the equipment rooms. In one instance, the error was responsible for over eight hours of troubleshooting before the cabling error was identified and remediated.	Supervisors should ensure that when complex, extensive cabling is required for a cutover, that the work is checked by a second set of eyes to catch potential errors that could result in extensive troubleshooting requirements.
Charles Mux Re-cabling Efforts	The re-cabling process, during cutover, can be accomplished in several ways with a positive outcome. The team was unsure as to which approach to use to accomplish the task.	The team needs to be clear regarding the specific approaches that will be used for specific tasks.
Clear Design Documentation	Without a clearly defined design, anything that is left out may result in different assumptions of use, condition and configuration.	Every communication circuit, site and function should be clearly defined so that any technician can step in and continue configuring the system.
Code Plug Modifications	During the Everett cutover, the technician troubleshot what he believed to be a problem and made changes to an approved codeplug without escalating it to the project team.	Staff is not to make any changes to code plugs either subscriber or infrastructure without escalating it through the project team.
Collaborative Troubleshooting Process	The collaboration and division of labor used by the team to troubleshoot issues was effective and efficient. The team's performance in this regard was exceptional.	Continue good process
Communications Center Power Distribution	After cutover of the D2 communications center, power was found to not be distributed between the two available circuits, and a breaker was found to be humming, which caused concern among the project team.	As part of a pre-cutover checklist, review the power distribution for the communications center, to confirm that it is configured as determined to be appropriate.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
Communications Center Staffing During Cutover	Adequate staffing is needed when only one console is cutover. That single individual will require backup at their station when taking breaks and being away from their station, so two persons will need to be on staff to cover the requirement.	Take into account someone taking a break and the need for someone to actually work the two different systems analog and P25. It was necessary to staff an extra person. If someone were to take a break the one left in the center was required to not only work the analog but also the P25 system as well with a 2nd headset. If the phone would have rung, the CO would not have been able to answer and still listen to the district.
Communications Control	Cutover activities were coordinated directly with the Communications Manager and D7 Leadership to ensure that adequate communications staff were on hand and ready to support cutover efforts from the communications perspective, and that district operational impacts were minimized, as much as possible.	Continue good practice.
Communications Officer Training	Though individual one on one instruction was provided, COs were still not comfortable with the different resources or how they were to be used. Information was also disseminated through email which was either misunderstood or ignored. Though messaged on a few different occasions, some had not paid attention and were not aware our external partners would be using the state frequency to communicate in the absence of a P25 compatible radio.	Accountability for each CO when trained and their understanding of the system. Use a Show Tell Do format during the training, document what was trained and have a check off for each CO.
Communications Officer Training	Following cutover of D2, perceived coverage issues were reported that could not be verified by ESD due to the lack of information pertaining to the exact location and the channel on which the communications were being attempted.	Ensure that communications center personnel attempt to confirm the exact location of the perceived outage and the channel on which the Trooper attempted the communication.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
Communications Officer Training	There is real value in both user groups (field/comm officers) in knowing/observing how each other's system/tools work. To address this Communications Officers are riding with troopers to see how the troopers utilize the Trunking feature, and troopers are spending time with communications officers to observe the steps/process each employ to respond to communications traffic. Additional, Communications Staff were all trained in advance of the cut-over to the Trunking system. Approximately ¾ of the staff got the training prior to the cut-over, the others followed afterwards.	Continue good process.
Communications Planning During Parallel District Cutovers	Two districts cannot simultaneously handle area traffic on the same frequency. Someone in ESD should have been aware D7 was taking area to state for a cutover prior to taking down a D8 area frequency pushing their traffic to State.	Greater Communication and coordination between ESD and Communications when two districts are working a cutover at the same time. You cannot effectively work two primary area frequencies on the same channel
Console Speaker Configuration	Immediately after cutover of the D2 communications center, it was discovered that cables linking the speakers to the consoles were missing, and required replacement. Motorola scrambled to ensure that the cables were put into place.	As part of a pre-cutover checklist, WSP should review all obvious cabling and other setup items, to ensure that the consoles are configured as determined to be necessary.
Coverage Maps	The team provides list of coverage problem areas. The need is for a simple easy to use graphically representation of the area, listing which tower to call from each area. This may not be possible for those areas where resources (towers) are moved or added. District needs to	Provide list of coverage issues as soon as possible and when possible provide in the form of a map. When towers are added or moved, provide suggestions on which tower to call for the affected areas.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	be prepared to take all information provided and expand as the use of the new/modified resources begins.	
Cross Muting	Double check cross mute configuration in MCC7500's to ensure that they are functional and as specified.	Need to ensure cross mutes are optimized according to the plan.
Cutover Celebration	Neutral coloring was not considered for the cutover celebration cake, which was provided following the cutover. As a result, the cake was ugly.	Don't let Dave pick out the cake.
Cutover Roll Call Procedure	Immediately after cutover, the communications officers in the dispatch center conducted a roll call to ensure that users were able to access the system, to validate that Trooper ID's were displayed as planned, and to test the emergency button function of the radio and the system. This proved to be an organized, efficient process.	Continue good process.
Cutover Staffing - Communications Officers	Adequate staffing is needed when only one console is cutover. It was necessary to staff an extra person. If someone were to take a break, the one left in the center was required to not only work the analog but also the P25 system as well with a 2nd headset. If the phone would have rung the CO would not have been able to answer and still listen to the district.	Take into account someone taking a break and the need for someone to actually work the two different systems analog and P25.
Daily Cutover Kickoff Meetings	Daily kickoff meetings were held one hour before kickoff activities were scheduled to begin, including Communications, District Leadership, and project team members. At the meetings, each group was surveyed for a "go	Continue good practice.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	forward" opinion and status, and key coordination issues were addressed. This helped keep the team's efforts coordinated and set expectorations.	
Deliverable Expectation Document	Communications between the project team and the district command was appreciated. This open line of communications was essential to the successful implementation of the IWIN Trunking feature in the District.	Continue good process.
Deliverable Expectation Document	A deliverable expectation document was developed for the District, on an APA by APA basis, to determine the best approach for implementing trunking and P25 Conventional coverage within the district, along with the limitations and benefits for how that communications architecture should be implemented. This document was developed by the project team leadership based on across-the-road coverage surveys, approved by the district leadership, and by the project's executive sponsors. This document set clear expectations and guidance for the district's P25 Narrowband Project Implementation.	Continue good process.
Dependence on Spokane County System Interface	For the Spokane personnel, yesterday also served as a good test for the new interface with the (Spokane County) trunked radio system. Although not totally unexpected, we now know for sure that the system can become overloaded when there is a county-wide emergency with all law and fire agencies trying to use the system at the same time. This is where the transition to the	For our normal daily operations, we will continue to use the trunked system but all personnel should be ready to move to our old system during major events such as snow storms. The trunked system provides us much improved coverage and interoperability while the conventional system has poorer coverage and no interoperability but more efficient service for WSP operations when the trunked system is overloaded. Please ensure everyone

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	old conventional Spokane area repeater becomes necessary until system loading is reduced.	under your command is well versed is using their radios on both systems as we need to be flexible in what system we use depending on the situation.
District and Communications Center Communications	Email updates were provided to district leadership, troopers and communications center leaders at an increasing frequency as the district moved closer to cutover. Information provided was intended to ensure that expectations were kept realistic, current and consistent. This appeared to be appreciated by those included in the communications.	Continue good process.
District Leadership Liaison	The District Leadership ensured that project leadership had access to a person who could make decisions and provide input to the team, at all times. This expedited decision-making processes and gave the project team confidence in their ability to move forward with district support.	Continue good practice.
Document Management: Unable to Access Documents	Permission settings and system locking documents made opening or editing documents impossible. This created frustration and/or version control issues.	This appears to be a problem with the tool used to hold the documents. Correct the tool or choose a different one prior to cutover.
Document Management: Unable to Find Documents	Naming conventions for documents could be improved. Confusing naming conventions and folders, organization and upkeep, made finding documents extremely frustrating and often impossible.	Everything should have a place and organization should be logical. Document naming conventions should be clear. Housekeeping needs to be improved.
Don't be Afraid to Question the Experts	The initial solution for the district did not provide acceptable coverage in some areas. The team was open to ideas and used local	Provide examples of changes made in other districts to each District Commander at initial meeting and what viable options are available. Make sure District

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	knowledge of know/potential problems to petition the executive staff for additional resources. District Command needs to be comfortable with questioning proposed solutions.	Commander knows he not only can, but is expected to challenge anything he/she does not understand and/or accept.
External Stakeholder Communications	Even though DOT was aware of the cutover, their IRT folks lost normal communications, as only their portable radios were P25 compliant. They could communicate on State Coms if needed, but calls were broadcast on the area frequency and their portables did not always receive the traffic.	Increase and target specific communications with external stakeholders who are dependent upon communications with the State Patrol, so that they have clear instructions and expectations.
External Stakeholder Communications	Email updates were provided to external stakeholders (WSDOT, DFW, etc.) at an increasing frequency as the district moved closer to cutover. Information provided was intended to ensure that expectations were kept realistic, current and consistent. This appeared to be appreciated by those included in the communications.	Continue good process.
False Positive Tests	When testing each site and repeated area, we need to consider the overall configuration to understand where false positive tests may arise.	Engineering and Technicians can mitigate this by validating the test criteria prior to cutover.
First Line Supervisor "Just in Time" training	It was anticipated, and expected, that first line supervisors would serve as advocates in the field for accurate messaging, expectation management, and the less technical, but critically important complications associated with "buttonology". The project team was invited to a district supervisors' meeting. At this meeting, the project team gave a high-level overview of	Continue good process.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	the system, introduced instructional videos, and gave supervisors an opportunity to actually use the system.	
Functional Spare Part Availability	During the project, several quantars were kept on hand as spare parts for sites where the existing quantars might fail during testing. The quantar at Devil's Mountain failed during testing and required replacement. The two spare quantars were found to be defective when replacement was attempted at the transmission site. The spare quantars had defective parts that should have been identified prior to committing those resources to the project as spares. Additionally, the quantars currently in use on the sites and kept as spares are between 13 and 18 years old and are not supported by Motorola.	1) Test all spares prior to committing them to a cutover effort, well in advance of a planned cutover activity. 2) As much as possible, do not use 13-18-year-old equipment as spare parts. Instead, plan to use updated technology, and invest in that technology in advance to ensure that adequate supplies are on hand.
Load Latest MCC Software	Update MCC7500's and VPM's with the latest software to resolve any audio issues in that FSB. This was not done prior to a recent cutover.	Need to ensure MCC's and VPM's have latest software prior to cutover.
Motorola Assistance in Resolving WSP Technical Skill Set Gaps	Motorola's contract currently limits the scope of its involvement to those items of equipment and specific responsibilities installed and identified for them in the contract. In many cases, WSP technicians are required to deal with complex LMR system issues that are beyond their current skill sets, and would benefit from Motorola team member experience during troubleshooting and planning efforts. This should be addressed, so that it is easier to call on the Motorola team for its expertise.	Establish a change order in the contract to enable the WSP project manager to call on Motorola for their assistance on a time and materials basis, when specific needs warrant their assistance, yet their assistance would specifically be considered beyond the scope of the current contract. Establish the change order to allow for consultation, planning and on-site technical services.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
Motorola Pre-pilot testing	Prior to the WSP user pilot testing, Motorola staff performed a controlled and monitored pilot test. This testing identified possible issues prior to the WSP user pilot testing which helped to insure the success of the user testing.	Continue good process.
Per-Cutover Inspections by Field Service Technician	At the time of cutover, it was found that numerous cables between the consoles and the speakers had been removed. Additionally, a concern was identified regarding a noisy breaker and the proper distribution of power for the communication center. These last-minute issues, while resolved, could have delayed the cutover schedule.	WSP needs to develop and use a pre-cutover final inspection checklist that will be completed by the WSP technical team prior to initiating the cutover process.
Pilot Testing Ag Users	Early in the process, District Command Staff was asked to make a "go/no-go" decision on the cutover project. Although coverage maps had been created and the system tested, the end users had not yet had an opportunity to validate system capability/capacity in "real world" situations. Pilot test groups were identified and were given numerous opportunities to provide feedback based on an extended period of system use. The Pilot users provided important "pre-cutover" feedback and acted as validators/advocates in the field.	Continue good process.
Programming Subscriber Radios with Trunking Talkgroups	When cutting over a district the subscriber radios are all aligned and keyed in preparation for the future effort of introducing Trunking operation capabilities to the Users in the District. The Subscriber units are all Keyed with a KVL to ensure they have the UKEK and Data Key in	Going forward, any radio (in a non-cutover dist.) that is being programmed with any 700MHz talkgroups should be aligned and keyed to ensure proper operation. Also, codeplugs Rev20-14 or newer should be used. This will enable the encrypted data stream in the radio so POP25 programming can be done if needed. The portables

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	them so they can be rekeyed over the air provided the units are provisioned at the UCM.	Statewide are all slowly being aligned as they come in for PM but the mobiles are not necessarily getting aligned until district cutover. There were about 400 of the mobiles that were aligned with the original Aeroflex script that reduced some 700MHz channels in the radio to very low power levels. Most of these have a round green sticker on them that says aligned.
Project Resource Telephone List	In previous cutover efforts, a telephone list was developed with contact information for the Motorola.	Ensure that the contact phone list is developed by the WSP Project Manager.
Reloading Patches	Make sure any talkgroup patches are reloaded after the MCC7500's are restarted.	Need to make sure patches are restored to normal after cutover.
Remote Connectivity Testing	Motorola tested remote connectivity prior to cutover to ensure the equipment could be accessed for programming. This was critical as problems were discovered which were troubleshot and resolved ahead of cutover. Had this not been done it could have created unnecessary delays in the actual cutover process	Continue good process.
Replacing Failed Units with Spares	During the cutover, we experienced a GPW receiver which would not pass audio to the V.24 circuit. The technician pulled the receiver board from the original receiver and replaced it with the receiver board from the spare. This created additional confusion due to the receiver boards not being compatible as they were different versions.	Always replace the entire end item rather than swapping subassemblies from the spare unit. In this case, one receiver was a Gen 1 and the other was a Gen 2.
Review Communications	Cutover issues discovered by project team members, including field service technicians and system administration, must be coordinated	Any and all issues which come up during the cutover must be escalated to the project leadership team for review and decisions. No modification is to be made to

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
Escalation with Team	through the project leadership (technical lead and project manager). This was not done in one cutover and resulted in significant confusion and frustration by team members addressing issues from differing perspectives.	the cutover plan without going through the project leadership.
Sharkee Antenna VSWR Correction	Sharkees, by default, come with an adapter inline for both the VHF and 700-800 coaxials. The adapter makes it very tricky to get a tight connection between Coaxial Connector and the RF ports on the radio. Cutting off the adapter and replacing with a standard 3 piece Motorola Crimp Connector results in a more secure and easy to work on connection.	Continue good process.
Site Spare Equipment	Spare equipment which was delivered to the site had not been pre-aligned causing delays in the project cutover effort.	Ensure pre-tested, programmed, and optimized spare equipment is on site.
Spare Cables	Two separate cable issues resulted in delays in the cutover process. Spare cables were not preconfigured or tested which further delayed this effort.	Ensure spare MLC, CCGW, and site cables are constructed and pre-tested as spares for cutover.
Spare Code Plugs	A failed receiver was replaced with the spare, however, the original receiver was a Gen 1 and the spare was a Gen 2. The technician was able to program the receiver with a Gen 2 version from another site and got the site operational after trying unsuccessfully to update the Gen 1 program.	Technicians should have both Gen 1 and Gen 2 versions of code plugs (or any other variations) to ensure they have the correct codeplug for any spare equipment being swapped due to equipment failures.
Spare Parts for Cutover	Should a problem arise at a site, the team does not have a spare GPW and GTR on site for use.	Team should check to ensure that the necessary spare parts are on hand prior to cutover.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
State Com Coverage	State Com is not available at every site that has an area base station. This resulted in portions of the district being without coverage during the P25 upgrade effort.	Need to verify any area that does not have State Com coverage so an alternative communications plan and/or expectations can be set and implemented, such as using LERN or another resource.
Subscriber Reprogramming Log	This subscriber programming log is kept in OneNote, and maintained by technicians in the field. During the course of retrofitting vehicles in D2, we had two instances of different technicians editing the document simultaneously, resulting in data conflicts. As these conflicts are multiple fields, correction was a lengthy and confusing task.	Recommend appointing one single technician at a time to edit these records to avoid this issue in the future.
Technical Coordination Leadership	For Districts 2 and 3, the LMR system administrator coordinated with the project's technical resources. That individual did not carry out the same function for District 5, indicating that he was not the supervisor for that district. There appeared a belief that his LMR's duties did not extend to this specific district. That action resulted in some tasks not being coordinated as they were in the past and the team had to make up for the shortfall.	The project manager and technical lead will manage at a more detailed level, given the issues that arose for this district. A specific technical supervisor will be designated, by name, to coordinate the detailed tasks and assignments for the WSP portion of the cutover, and for coordination with Motorola during the actual cutover.
Technician Radio Equipment	Technicians were limited in terms of being able to test sites in the field because they were equipped with portable radios, with small antennas and low power output. Mobile radios have much greater range due to their better antenna and greater power.	For testing new and converted sites, ensure that technicians have mobile radios, rather than just portable radios, so that the technicians can better reach remote sites, and save time and driving times for transmission and emergency button testing.
Technician Spares	Technicians physically visiting the sites did not have spare equipment in their vehicles. This resulted in delays, which resulted from	Technicians physically visiting sites should have spare equipment in their vehicles.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	additional personnel having to transport equipment to the site.	
Technician Test Radio Code Plug Configuration Management	As part of the site testing process, one of the technicians used his portable to test Sobieski. When his portable would not connect to the site, on his own initiative, he modified the station's code plug's NAC, so that his portable would connect. The portable, it turned out, had the wrong code plug in it, and so the change was not appropriate, even if not approved. Team members had to be dispatched to the site to reinstall the approved code plug.	Supervisors must ensure that their technicians have the correct tools prior to supporting a cutover effort, including the correct code plugs in their own radios.
Technician Troubleshooting and Collaboration	In several instances, members of the team attempted to troubleshoot system issues without the benefit of collaboration. The issues were ultimately resolved once the integrated Motorola/WSP technical teams met, although that only occurred after several hours of effort were expended. This delay in issue remediation might have been avoided if the team had been called together briefly prior to each major troubleshooting effort, to collaborate on the potential solution.	Coordinate troubleshooting efforts through the project management leadership (Motorola PM, WSP PM, Motorola Engineering and WSP Technical Lead) to ensure that group focus is applied to complex issues, to bring more background and knowledge to issues early in the process.
Technicians Need Generation 1 and 2 Codeplugs During Testing	Technicians required to swap out equipment in the field, during testing, did not have both code plugs for Generation 1 and Generation 2 GTRs and GPWs. This delayed and complicated the troubleshooting process.	Ensure that technicians have both the Generation 1 and Generation 2 code plugs available for programming, when swapping out GTRs and GPWs, since both versions of parts are present on sites and in the spares inventory.
Training -- Communications Officers	Though individual one on one instruction was provided, COs were still not comfortable with the different resources or how they were to be	Accountability for each CO when trained and their understanding of the system. Use a Show Tell Do format

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	used. Information was also disseminated through email which was either misunderstood or ignored. Though messaged on a few different occasions, some had not paid attention and were not aware our external partners would be using the state frequency to communicate in the absence of a P25 compatible radio.	during the training, document what was trained and have a check off for each CO.
Training -- Trooper Supervisors	In District 3 the training videos were uploaded into the district server. We had created a file on the "shared" drive for materials associated with the P25 Narrowband transition and cutover. The user group (sergeants/troopers) were instructed and tracked to view the training videos a total of three times prior to the transition to IWIN Trunking. In addition, the communications officers also viewed the training videos. On the day(s) when the radios/portable radios were up-graded (software), the ESD technicians spent approximately 15 minutes manually showing the sergeants/troopers the features of the Trunking. District command also provided a 'quick reference' card for each user with their assigned APA and the adjoining APA's trunked talk group channel set-up.	Continue good process.
Troopers Training	This is the critical piece to the success of the cutover. In District 7, the following steps were conducted: Troopers completed the provided Power Point training, which was tracked via e-Train; The cutover team (Dave and Mark) attended a district leadership meeting to answer questions from local sergeants; Prior to cutover,	Continuous messaging is required. Even after every trooper had completed the PowerPoint training, some were not aware of the instructional videos. We realized early on that if the training was not "launched" in PowerPoint and the trooper merely tabbed through the individual slides, the links to the videos were not enabled. Even though this was messaged and the training sent out

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	all troopers completed a "competency checklist" facilitated by the detachment sergeant; E-mails related to the process were sent to everyone in the district prior to and at the time of cutover. Not all troopers understood that the trunked channels were an additional asset. For example, a trooper in the north end of the district told me that communications could not hear him when he signed out of service at his house. I asked if he had tried the trunked zone, but he wasn't aware that he could; stating he thought he was supposed to be on the conventional zone. As stated by the cutover team and in other lessons learned documents, some sort of exercise requiring moving between trunked and conventional zones would be beneficial.	multiple times, a number of the troopers had not watched the videos. In hindsight, I would verify (possibly as part of the competency checklist) that training videos, poor reception areas, and channel guides were saved to the troopers' tablets
Trooper Training	The use of video training and accessibility from the Trooper's computer, either laptop or desktop helped provide on-going support prior to and during cutover.	Continue good process.
Trooper and Communications Officer Training	The value of the quality and comprehension of the radio training provided to FOB and COMM personnel prior to cutover cannot be overstated. There is a direct correlation between this training and the success of the cutover.	Continue good process.
Trooper and CO System Familiarization Following Cutover	District 3 was already on the P25 conventional system. We did not do any pilot testing, rather the approach in the district was: 1) each user was directed to 'test' the Trunking system within their assigned APA. 2) Communications Officer were instructed to work with the user group	Continue good process.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	(troopers) to test the Trunking system in the previously identified problem areas.	
Trooper Training	Users called into dispatch for instructions on how to access the correct zone and channel however, dispatch is somewhat unfamiliar with the mobile and portable radios.	Provide basic Mobile and Portable radio distraction/instruction to dispatch prior to cutover. Possibly leave a portable and board mounted mobile in the dispatch center several days prior to cutover to allow dispatchers to get comfortable with talking users through issues.
Trooper Training	Training is a critical piece to the success of the cutover. In District 7, the following steps were conducted: 1) Troopers completed the provided Power Point training, which was tracked via e-Train. 2) The cutover team (Dave and Mark) attended a district leadership meeting to answer questions from local sergeants. 3) Prior to cutover, all troopers completed a competency checklist" facilitated by the detachment sergeant. 4) E-mails related to the process were sent to everyone in the district prior to and at the time of cutover.	Continue good process.
Trooper Training	Even after every trooper had completed the PowerPoint training, some were not aware of the instructional videos. We realized early on that if the training was not “launched” in PowerPoint and the trooper merely tabbed through the individual slides, the links to the videos were not enabled. Even though this was messaged and the training sent out multiple times, a number of the troopers had not watched the videos.	Continuous messaging is required. In hindsight, I would verify (possibly as part of the competency checklist) that training videos, poor reception areas, and channel guides were saved to the troopers’ tablets.
Trooper Training	Not all troopers understood that the trunked channels were an additional asset. For example,	As stated by the cutover team and in other lessons learned documents, some sort of exercise requiring moving

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	a trooper in the north end of the district told me that communications could not hear him when he signed out of service at his house. I asked if he had tried the trunked zone, but he wasn't aware that he could; stating he thought he was supposed to be on the conventional zone.	between trunked and conventional zones would be beneficial.
V.24 Cable Tests	It became clear that our testing procedure for V.24 connectivity is flawed. Either the test itself is flawed or the circuit used, as told by the vendor, is incorrect.	The test should include a final configuration test. The radio should be programmed for final configuration and connected to the system to verify the system acceptance.
Vehicle Retrofitting with Use of APX Auto-tune	We initially used two technicians per vehicle for retrofitting, and had continued for several days as such. The 2'nd tech didn't really have much to do except for pushing the PTT on the mobile microphone, while sitting in the driver's seat.	A huge timesaving measure was discovered in the use of the APX Tuner software, which allows for the technician to PTT via software from the back of the vehicle. PTT is used during wattmeter readings, and is critical for every vehicle. The elimination of the need for another technician to push a button improved output significantly, resulting in several instances where the crew was ahead of schedule.
VPM Shield Replacement	Swap shields on VPM's to mitigate risks of rolling resets.	This is a best practice at the next available maintenance opportunity.
WSDOT Coordination	Even though DOT was aware of the cutover, their IRT folks lost normal communications, as only their portable radios were P25 compliant. They could communicate on State Coms if needed, but calls were broadcast on the area frequency and their portables did not always receive the traffic.	Escalate communications to WSDOT management to ensure that cutover information reaches the Incident Response Teams prior to cutover.
User Pilot Testing	The pilot testing process operated under a specific set of rules with outcomes reported and analyzed was very effective in not only	Continue good process.

Title	Description Lesson Learned	Specific Recommendation for Process Improvement
	determining possible technical issues but also training and operational issues.	

Appendix B – Project Risk Management Log – Closeout

Table 13 - Risk Management Log

Risk ID#	Title	Risk Description	Risk Mgmt. Strategy	Risk Mgmt. Plan	Risk Status	Submitted By	Date Opened	Date Closed	Likelihood of Occurrence	Impact Cost	Impact Schedule	Risk Outcome
1	ISSI Connections	The project is nearing completion and the list of ISSI candidate partners and agreements has not yet been finalized. If this is not finalized soon, then the project may need to be extended beyond Motorola's contract period, and the WSP project team may lose the benefit of their expertise when implementing the ISSI connections.	Avoid	Pierce County has been selected as the first ISSI candidate. Bob Schwent has the action item to set up a meeting with Pierce County to discuss the details for the implementation and select the target talk groups. A change request has been submitted to Motorola for assistance implementing this first connection. If this is not resolved soon, then ISSI will be added to the end of the project, post-FCC compliance.	Retired	Joint WSP/Motorola Team	10/17/2013	5/17/2016	80%	$15,000	None	This risk has been manifest and retired. The impact to the project is being documented as a change to project scope.
2	Academy Consoles Not Defined	Motorola has indicated that they feel the Academy deliverable requirements were met several years ago, that console configurations were created and delivered (verified as	Mitigate	Finalize definition of the Academy console requirements; resolve the difference between Motorola and WSP regarding the delivery of those requirements, in fact; escalate to the Project	Retired	Joint WSP/Motorola Team	10/17/2013	2/10/2016	80%	$15,000	2 mo.	This risk is retired and incorporated into a new risk that addresses the potential for scope change related

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		factual), and that the equipment for the Academy consoles has been diverted from its intended use by WSP, or with WSP's sanction, and has been in beneficial use for an extended period of time. If this is the case, then setting up console positions for the Academy may no longer be in scope, and the deliverable may not be provided as intended by the contract.		Sponsor to develop an approach that results in the Academy receiving the console deliverables, as envisioned by the project.								to the Academy's changing requirements.
3	Marysville Cutover	Cutting over Marysville to P25 will be highly complex, per the Motorola engineering lead; requires cutting over RF and operator positions.	Mitigate	Include a timeframe for discovery to 1) analyze the requirements; 2) develop a plan; and 3) execute the plan. This has been incorporated into the project approach.	Retired	Joint WSP/Motorola Team	10/17/2013	6/1/2015	0%	$0	None	A workshop was conducted. The approach for Marysville was identified, clearly, and with minimal risk.
4	Capacity Analysis Results Impact	Capacity analysis results, being completed by Motorola, can change the task list and how	Accept	The Capacity Analysis Report provides a model that can be used to focus district and area-specific surveys prior to district	Retired	Joint WSP/Motorola Team	10/17/2013	1/2/2014	0%	$0	None	Capacity analysis continues as a routine process,

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		deployments are to be approached.		cutover, to quantify capacity issues and develop strategies for mitigation and avoidance of related risks. This risk can be retired, since the results of the report do not currently result in any specific risk to the project.								revealing complexities but no major challenges. Busy rate is acceptable, per project sponsor. Major channel expansion scheduled for 6/2015 may provide additional capacity.
5	Project Schedule - Narrow-band Deadline	We have 7 months until 8/1/2013 to complete Cutovers for NB. We need to have resource loaded schedule to remain on-schedule. We have many scope items to complete by end of 2013 - per current schedule.	Accept	10/2013 Update: Schedule was revisited and extended based on a detailed analysis by the project team. Original mitigation plan: Complete the narrowbanding portion of the project as the highest priority. Continue to assess the cutover timelines and need for adjustments to the schedule. Motorola and WSP to have required resources to complete the	Retired	Blair Vincent	3/1/2013	10/30/2013	0%	$0	None	The schedule extension was approved by the project sponsors, to 6/2016, and appears to be holding.

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				cutovers, monitor the cutovers - quickly resolve issues, and complete the remaining project scope (700 MHz, NICE/DOJ interconnect, Fleet Map, Subscriber re-touch, CAD)								
6	Site Readiness for District Office Cutovers and 700 MHz Sites	Complete site readiness review for District Offices prior to cutover and 700 MHz sites.	Mitigate	Mitigate the impact by analyzing requirements in advance. District Offices: We have completed site audit reports. We have pre-cutover checklists defining all requirements prior to cutover start. These documents are reviewed weekly. We have a punch list of items needing resolution. 700 MHz Sites: Completing final site audits to document all required site work required prior to equipment installation.	Retired	Blair Vincent	11/1/2012	12/17/2014	0%	$0	None	Standard procedure has WSP STs analyzing site readiness, completing a checklist and providing that to the technical team leader for tracking. The results continue to be very good.
7	User Acceptance of the System	The key success factor of the project is user acceptance of the system. Users must be trained on how to utilize the capabilities of the new System. We must	Accept	This risk has been, and will continue to effectively be mitigated through the use of the Deliverable Acceptance Document, to set clear expectations for each district, and through constant and ongoing	Retired	Blair Vincent	10/10/2012	12/17/2014	0%	$0	None	Training was emphasized as a part of the projects. This training of users has resulted in a significant

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		quickly respond to issues during and post cutover at each Districts (resources, support plan).		communications with each districts' Troopers, Leadership, and External Stakeholders								increase in user acceptance, along with emphasis by the district commanders and thorough communications before, during and after cutover.
8	Subscribers - Need to Complete Fleet Map / Templates & Re-touch All Subscribers	Not completing Fleet Mapping within schedule - make decisions to expedite, could extend the schedule and create a need for rework.	Accept	Execute a Plan of re-touching all subscribers (making sure we do not have to touch the subscribers more than once). Define the expert team with decision-making authority to complete fleet mapping. Define the Plan for re-touching the subscribers.	Retired	Blair Vincent	10/12/2012	12/15/2013	0%	$0	None	Management emphasis continues to focus on keeping the fleetmap current. All radios are touched as a part of the cutover process.
9	DOJ Interconnect.	Unknown as to whether we are we going forward with the DOJ Interconnect?	Mitigate	NICE requirements deferred until post-production cutover of the new system.	Retired	Blair Vincent	10/12/2012	10/30/2013	0%	$0	None	Issue was deferred.
10	Coverage in District 6 and Others	We have a very real risk particularly in District 6 with coverage. Depending	Mitigate	Complete NB analog and WB analog coverage surveys to identify the impact of implementing	Retired	Mark Vetsch	10/31/2013	2/1/2016	100%	$0	None	Narrowband coverage has been identified as the

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		on how P25 conventional performs in this area and the potential of multipath interference; we may be faced with narrowband analog which would create coverage reductions and the need for additional sites. This is a risk in any area which does not have IWN coverage and where we're relying strictly on the P25 conventional channels.		NB analog in Wenatchee and Okanogan areas, remediation strategies and the message for Troopers and users.								approach for the district. A contract amendment was funded and approved to provide that coverage in the northern areas of the district.
11	User Expectations - Coverage Remediation	Users of the old and Narrow Band Project believe that the new radio equipment and DOJ interface will resolve current communications reception and transmission challenges. The truth is that if a problem existed prior to Narrow Banding, that problem will likely	Mitigate	Mitigate the risk by ensuring that expectations are consistent within WSP and the districts. Do this through one-on-one meetings with district commanders, incorporating the information during training sessions, WSP leadership meetings, and publication of an Expectation Approval Document for each	Retired	Dave Pratt	1/2/2014	12/17/2014	90%	$600,000	1.5 months	Communications with districts, external stakeholders and Troopers have been integrated into the project approach. This has proved beneficial in setting and maintaining

Risk ID#	Title	Risk Description	Risk Mgmt. Strategy	Risk Mgmt. Plan	Risk Status	Submitted By	Date Opened	Date Closed	Likelihood of Occurrence	Impact Cost	Impact Schedule	Risk Outcome
		still exist. This project is focused on meeting a FCC communications mandate. Resolution of specific issues related to communication dead zones and such are outside the scope of the project. Note that the information gathered during this project may help to resolve those issues through the ongoing efforts of WSP to strategically improve communications throughout the state.		district, laying out the planned configuration of communications in that district for user and command review and approval.								expectations, although not always without expansion of the scope. The emphasis on this outcome focuses on the deliberate management of scope change that has resulted from this process, as in the case of D8, where project scope was expanded considerably.
12	Marysville Console Troubleshooting Impact on Project Resources	Marysville Op5 terminal has experienced repeated outages. After significant discussion, Motorola project resources (Dan) were removed from the Yakima Cutover effort and moved to Marysville to resolve	Mitigate	Motorola (Dan and Robert) are checking into the Marysville issue, and will expand into looking at the Bothell Main Site to see if there is a connection between the issues at Marysville, Portland FBI and USMS Tacoma. We can't really make a connection between the	Retired	Mark Vetsch	1/15/2014	6/20/2014	0%	$0	None	Console issues were resolved by WSP STs.

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		the issue. Since that time, several other sites (Portland FBI and USMS Tacoma) have reported similar issues. Should this continue and Motorola continue to divert key project resources from the Yakima Cutover effort, the project's schedule could be negatively impacted.		issues until that has been completed. It may be an interzone issue, but could be a variety of issues that need to be addressed, and may not be a project issue. We do not have a timeframe for when this all will happen, since the team is still deep into the Marysville issue. More information will be forthcoming from Motorola as they check the situation out.								
13	V.24 Link Issues	A potential, significant problem has been confirmed with the V.24 links that carry our communications across the state, which causes them to throw errors and go down. This issue must be resolved as a matter of officer safety. If a link is partially down or totally down, it will result in totally lost communications or bad audio quality. The combined technical	Mitigate	Develop a plan with Motorola to assess remaining V.24 link issues and plans for remediation.	Retired	Eric Felch	2/21/2014	6/1/2015	90%	$0	None	Troubleshooting and testing of V.24 links have identified a specific fix that has been implemented with great success. Subsequent V.24 link testing has resulted in positive outcomes.

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		teams from WSP and Motorola agree that this situation must be fully assessed and resolved prior to moving forward with Pilot Testing in Yakima or any other district, in that it potentially impacts officer safety.										
14	Console Configuration and Functionality	Numerous issues have been reported by Communications regarding the configuration and functionality associated with the console scheduled to be provided by the P25 project. They include loading the P25 consoles with the tabs of other districts; too much moussing to select the drop-down on even more frequencies; the way the patches from trunked to conventional are going to work, a patch	Avoid	A change request has been submitted to address this issue, and eliminate the risk. A meeting with Communications Officers and ESD from several locations in the state validated the need to standardize and modify the console functionality to ensure usability, speed and officer safety.	Retired	Dave Pratt	2/7/2014	8/2/2014	100%	$350,000	90 days	New mat. format has been implemented with great success. This risk is retired.

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		between a frequency that has the drop downs will ONLY patch the current drop-down-selected transmitter for patching; emergency tones (the beeper) that only activates on the transmitter that is selected on the drop-down; drop-down selectors are entirely too small and hard to hit accurately when busy or in an emergency; and the need to change the drop down for a frequency at one console, which then changes it at all consoles.										
15	WSP Resource Loading	The version 2.0 schedule requires parallel efforts for radio programming, V.24 installation, CR 10 equipment installation, and physical road surveys. Should the	Mitigate	Build contingency into the cutover schedules to accommodate potential impacts from parallel efforts.	Retired	Dave Pratt	5/5/2014	10/20/2014	0%	$0	None	Close monitoring of resources and realistic scheduling has resulted in this risk being effectively mitigated.

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		staff be diverted from these efforts by other priorities, then the schedule may be impacted accordingly.										
15	Project Scope Creep - Communications Initiatives	There are numerous communications enhancements that are ongoing within WSP, and peripheral to the P25 Narrow Band Project. These projects, while not necessarily intended as a part of the project, impact the project in that they modify the communications architecture of the state. The Highway 410 improvements, Pierce County ISSI, Kelso remediation, and Spokane ISSI/interoperability initiatives are several that have been identified. Each one of these initiatives will require and update to the project's fleet map, potentially require	Mitigate	Manage changes through a careful change control program. Assess each change and its impact as they are identified.	Retired	Dave Pratt and Mark Vetsch	5/10/2014	7/14/2014	100%	$0	None	Careful change control and resource management has negated the potential impact of this risk.

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		update/modification of the code plugs, console configurations, vendor and WSP effort and labor costs, will divert resources from currently planned project activities, and project time. In each case, it is anticipated that the project schedule and cost will be impacted by the initiatives.										
17	Channel Markers for Emergency Tones	Channel Markers for Emergency Tones – The ability to clear a frequency across multiple antenna sites, to ensure that frequencies are kept clear during emergency situations has been identified as a requirement by the Communications Division. This was possible, to a limited degree, with the analog system but is problematic under the	Mitigate	Motorola has developed, and WSP has accepted, a modification to the system, at no charge, to provide this capability. Communications Division has approved the change.	Retired	Dave Pratt	5/20/2014	7/14/2014	0%	$0	None	Channel marker enhancement has been implemented with great success as part of a major change order. This risk was effectively mitigated.

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		digital model. The impact to project schedule is anticipated as negligible. The impact to project cost is being estimated by Motorola at this time. Project Manager Update: Testing is complete. The solution is likely to be provided at low or no cost. However, an issue has arisen, related to the Change Order #10 implementation that impacts the project's ability to successfully deliver this solution.										
18	Antenna Site Power Settings	In many cases, power output at antenna sites is perceived to be at levels that are well above the transmission needs for those sites, often by several orders of magnitude. In instances where multipath creates interference with analog signals, it	Mitigate	This risk has been addressed in D2. Power settings were found to have little impact on reception. While this risk is retired for the project, ESD will continue to inspect and tune antenna sites as an operations and maintenance function.	Retired	Dave Pratt, Mike Giger	6/16/2014	8/2/2014	0%	$0	None	This risk was retired as a non-issue, based on Engineering assessment.

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		potentially cancels out digital signals. Where those power levels are excessively high, adjusting them down to the lowest level necessary to serve the target coverage areas would potentially reduce multipath interference and increase signal coverage.										
19	TRIS Interface Audio Quality	The TRIS system provides "system-to-system" interfaces between console systems associated with the King County, Snohomish County, Port of Seattle, City of Tacoma, and FBI radio consoles. The purpose of this system is to allow the various agencies to patch their radio systems together, under dispatch control, for mutual aid operations. This patch has been used for events such as May	Mitigate	From External QA: The G.728 vocoder should allow a couple of tandem connections assuming all of the audio in the "network" is vocoded with G.728. If there were cases where audio was converted from P25, such as at the output of a conventional P25 station using the analog interface (4-wire audio) instead of being a digital connection (V.24 or similar) then there might be some problem. So, at this point, I think	Retired	Joe Blaschka, QA	6/16/2014	12/17/2014	0%	$0	None	This risk was assessed and found to be not applicable to the project's design.

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		Day parades and WTO meetings. The patch interconnects the consoles together using 4-wire audio connections. Currently, the connections are made using "BIM-to-BIM" analog 4-wire audio circuits. As the trunked radio systems are being converted to Motorola 7.X versions, the analog audio is converted to "vocoded" audio in the Motorola controllers. This could create a situation where the audio is "double-vocoded" resulting in poor quality or unintelligible audio. Currently, the interface in some of the 7.X systems connects through the legacy Motorola Gold Elite console interfaces retaining non-vocoded		the WSP should be ok with the TRIS connection. However, there is some risk that overall in the entire TRIS network, there could be another conversion somewhere. Nevertheless, that is out of the WSP control and would exist for all of the other TRIS users as well.								

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		audio. However, as these are converted to Motorola MCC7500 consoles and associated CCGWs, there is concern that the audio will be vocoded at each end resulting in double vocoding.										
20	D2 Trunking Capacity Requirements	The 700 MHz Trunking system in D2 will be limited to a maximum of 4-5 simultaneous conversations at any point in time. This capacity may be further limited when resources are linked to the Federal IWN system, which will, by its technical nature, constrain the trunking system's capacity further. If this risk manifests, then the system may not fully and adequately support D2's communications requirements.	Mitigate	This risk has been retired. Since raising this issue, Motorola has identified that if the IWN and 700 MHZ trunking systems are patched at the console, the translation will take place there, effectively eliminating any risk of impact to capacity. This is a known feature, identified by Motorola management, that will be tested and confirmed during Pilot Test.	Retired	Mark Vetsch	7/25/2014	9/9/2014	0%	$0	None	This risk did not manifest. Additionally, Motorola is implementing a channel expansion change order at no cost to WSP, which enhances the system's capacity.

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21	IWN System Issues	Per Motorola, the FBI needs to fix their IWN equipment and bring it up to the latest configuration, or there may be negative impact on the interoperability and sharing that is planned between WSP's communications system and that which is owned and operated by the FBI. A few weeks ago, the following specific issues exist, of which the FBI has been made aware: Terminal Server broken – Provides direct access to servers for software updates. Boundary switch is broken – Provides access to system for support. Valid connection would also need to be verified prior to starting any upgrades/patches. The FBI does not	Avoid	This issue has been resolved. Motorola originally raised the issue. However, the major hardware issues have been fixed and Motorola (Brad Steiner) has since informed WSP that Motorola software is compatible through up to two version changes. Therefore, the IWN system's current configuration will not impact the WSP's system to communicate between the zones.	Retired	Blair Vincent	8/4/2014	9/8/2014	0%	$0	None	Motorola and WSP worked with IWN to update the system and bring them into sync with WSP's system. This risk was avoided.

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		currently have a support agreement with Motorola. The agreement is bogged down in the DOJ system, and is being worked by the local authorities and ESD Commander. Therefore, the necessary equipment repairs and software updates are the responsibility of the FBI and IWN technicians. Motorola/ P25 team cannot be certain as to where the IWN system is, specifically, nor the extent of the work required to bring the system into configuration, and ensure its compatibility with WSP's system. If not resolved, this may impact the ability of the two systems to interact effectively, and impact the										

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		project's schedule and progress. This issue has been escalated to the Project Sponsor level (Bob Schwent). Further escalation is not required at this time.										
22	V.24 Link Failures - Comparators - - Vancouver Area	The comparator data gathered by Motorola supplied is showing some of the V.24 links connections are still having significant issues as we've discussed since the beginning of the project. Motorola considers this a serious issue that needs to be corrected immediately for the Vancouver area since the system has active users. Motorola ran the data that was supplied on the critical malfunction errors on all the dates to see how the link errors were over the period of time for all the units. The data shows the errors	Mitigate	Risk was escalated to Executive Sponsor level. Accepting the risk for D2 cutover, as primary system there will be 700 MHz Trunking. Mitigate risk and remediate issue for remaining districts by doing causative research in parallel with D3 cutover.	Retired	Rick Roark	8/14/2014	3/24/2015	0%	$0	None	Senior management assessed the risk impact as minimal and approved recommendation to proceed with cutovers.

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		over the time period. The links for comparator 1 & 3 have a very serious issue. With the links going down, that means no communication during these time frames. Motorola is also looking at Yakima and Spokane districts since these have been cutover as well to determine if there are additional areas of concerns.										
23	TCNT File Update Process	The concern is the FBI review and how long it may take. The Motorola Federal team has discussed this with the FBI and they came up with the process, with WSP participation. However, the process has not been tried, and if the process is delayed, there may be a commensurate delay in	Avoid	Bob S. to escalate the issue to Charlie, IWN Chief, for clarification and confirmation of the process, to avoid the potential schedule impact.	Retired	Rick Roark	8/18/2014	3/15/2015	0%	$0	1 week	File update was completed in 4 weeks, with little residual outcome.

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		the D3 cutover schedule.										
24	Trooper Coverage Area Knowledge	Troopers reportedly are not aware of specific, existing and known areas of no-coverage in the districts may continue to express concern over the ability of new radios systems (i.e. 700 MHz and DOJ/IWN trunked radio) to support their needs.	Mitigate	Update training programs used for Troopers to place additional emphasis on documented, known areas of no-coverage. As a part of that effort, publish a list of known no-coverage areas on interstates and state routes, for districts to use in educating their Troopers. Add this list to each district's training package, provided by the project. For those districts already cutover, provide that information in retrospect to district leadership for their use. In District 2, provide resources to ride along with Troopers who have experienced challenges with their radios, for a brief period of time, to provide on-the-spot training and information. Other districts, such as D3, D4, and D5 may not require the ride-along approach,	Retired	Dave Pratt	3/2/2015	6/1/2015	75%	$0	3 weeks	District commanders have been provided with lists of poor and no coverage areas within their districts. This information is provided to the Troopers during training by the district, and is emphasized during ongoing operations. This risk is now being managed by the districts.

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				since they currently operate using P25 Conventional radio, and so little operational change is anticipated.								
25	Key Resource Single Point of Failure	The Land Mobile Radio (LMR) System Administrator position for the P25 Narrowband System solution is held by a single resource, who also serves as administrator of the NICE system and is a Region 3 Field Support Supervisor for District 3 staff. The workload for the single resource exceeds his available bandwidth, creating a situation where his lack of capacity to support project needs on a timely basis may impact project efforts and timelines.	Mitigate	Management is establishing an LMR System Administrator Position. This action, when completed, may mitigate this risk.	Retired	Mark V and Dave P	3/25/2015	2/10/2016	0%	$0	None	A dedicated LMR system administrator has been hired to support the system.
26	Addition of IWN sites in District 2	Adding all IWN sites to the D2 talkgroups poses a risk due to the FDMA operation of	Mitigate	Monitor system busies closely to verify the impact of including all IWN site. Consider	Retired	Mark Vetsch	3/26/2015		50%	$0	None	The addition of IWN sites to D2 was attempted and

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		the IWN system along with the limited capacity of the IWN sites. Since the WSP area and car-to-car talk groups are configured for requested sites (all sites come up regardless of whether a user is associated with that site) the risk of enabling multiple active talkgroups on these sites could result in increased system busies experienced by the users. The risk associated with not including these sites is system users having no coverage in areas where the IWN system does in fact provide coverage so long as the system is not currently in use. The risk of disabling "requested sites" is that users sitting on car-to-car could miss area traffic or users		modifying the requested site configuration and train users to understand the limitations associated with this change.								found to stimulate a high rate of busy signals for the district. The trial was rolled back to avoid future risk.

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		sitting on area could miss car-to-car traffic.										
27	Narrowband Analog Requirements for D8	There is a potential risk that narrowband analog radio communications may be required in D8. An ongoing assessment of P25 conventional coverage in the area has revealed this potential.	Avoid	Conduct an Engineering review, with written recommendations based on coverage survey data completed by WSP Engineering, to make a final determination of the P25 conventional and NB analog needs of the district.	Retired	Dave Pratt	5/12/2015	6/22/2015	0%	$0	None	Engineering survey of the district ruled out the need for narrowband analog.
28	D1 Communications Architecture Complexity	District 1 has a great need for interoperability across its APAs. D1 has the potential for the use of 700 MHz Trunked, P25 conventional, IWN Trunked, and interface with Pierce County's trunked system. The district may require a specific and potentially complex mix of these approaches. The risk associated with this exists in developing the best mix so that Troopers in the district have the best internal	Avoid	Allow time in the schedule for a detailed analysis of the needs in each district. The project sponsor will work with Pierce County to identify effective approaches for interfacing with their system, to support coverage and interoperability needs. The approach will be reviewed with D1 leadership to ensure their pre-knowledge, input and collaboration on the resulting architecture.	Retired	Dave Pratt	6/1/2015	11/25/2015	100%	$460,000	4 months	A 700 MHz site will be installed at Maxwell, to address D8 and D1 needs in Olympia which, in conjunction with the coverage from Cougar Mountain, and the addition of consolettes for integration with the Pierce County System in Tacoma,

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		operability, and interoperability support possible.										should effectively avoid this risk.
29	Project Contingency Budget	The remaining contingency budget is approximately $100,000. Known change requests have been factored into the existing requirements, which can be funded without accessing the remaining funds. Should any major change requests be identified for the project, such as the need for narrowband analog in Districts 1, 7 or 8, the ability of the project to fund those needs would be at risk.	Mitigate	Continue to carefully screen all potential change requests, to ensure that only those requirements that are critical and essential to the completion of the project are funded as the project moves forward.	Retired	Dave Pratt	6/1/2015	9/8/2015	0%	$0	None	The lack of contingency was reported in error. Reconciliation of the project budget with the fiscal office has shown more than $500 K in unexpended funding.
38	District 8 Coverage Complexity and Expectations	In D8, ESD Engineers ruled out the use of narrowband analog in favor of P25 conventional radio. They did this reportedly based on an objective analysis of coverage surveys completed by Field	Mitigate	The project sponsor issued direction to implement as many as 4 transmission sites in D8, including one at Cosmopolis, Neilton and two sites to be named later, along with specific timelines for installation, site addition, etc. This fixes the scope in place.	Retired	D Pratt vice B Schwent	10/26/2015	11/25/2015	100%	$600,000	1.5 months	This risk is manifest. Two new P25 sites, including a move of a site to Cosmopolis, new sites and Neilton and Minot, plus a

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		Service technicians, tempered by their professional judgment. Subsequently, the project sponsor received a clear statement from ESD Engineering's lead technician that the loss resulting from the conversion of D8 from wideband analog to P25 conventional radio would be marginal, if any. In contrast to Engineering's input, back in July the project received feedback from D8's Field Service technicians – who are very familiar with their district – that they felt the loss of coverage resulting from the conversion to P25 conventional radio would be significant and untenable for the district. They related that concern to the D8		The project team will re-plan the balance of the project in accordance with the guidance and estimate any impact to the D8 cutover schedule and target date for FCC compliance.								new 700 MHz trunked site at Maxwell should remediate the impact from this risk, which was realized. The change orders have been submitted for this addition to scope.

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		Commander, who escalated those concerns to his Assistant Chief. The result of escalation of the issue to senior management elevated the project team's concerns for the district's communications profile and led to a sense that something should be done to remediate the potential loss of coverage. The concern expressed by project leadership left the project open to additional, unknown expansion of the project's scope, and an inability to fit a reasonable schedule to a defined effort. This risk places the project schedule and budget at risk.										
39	Motorola Resource Continuity	Given the current delay in the project in D8, which was generated by WSP,	Accept	Discussions with Motorola suggest that Motorola is sensitive to this issue and, as much as possible, will	Retired	Dave Pratt	9/29/2015	2/1/2016	30%	$0	None	Motorola has successfully managed their resources and

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		Motorola has completed all possible work to prepare for the D8 cutover. Efforts for the other two remaining districts (D1, D6) are at points in their planning where Motorola's remaining efforts are marginal. As a result, Motorola is reassigning its technical resources to other projects. As a result of this, WSP faces a risk that the current vendor resources may be lost to the project permanently, creating continuity issues for the effort and potentially impacting project schedule once Motorola resources are once again assigned to the project, for ramp-up and familiarization with the project.		attempt to return our current vendor resources to the project once WSP has resolved its planning issues for D8, D1 and D6.								linked them to WSP's project needs, as the project moves forward.
40	Contracting Requirements	WSP is currently considering expanding	Accept	Plan for the extended contracting lead time for	Retired	Dave Pratt	11/2/2015	11/25/2015	100%	$0	1 month	Project schedule has

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	for D1 Expansion of 700 MHz Trunking	700 MHz trunking to the Olympia are in D1. This effort may be relatively expensive for the project, although funds exist in the budget to potentially cover the requirement. The recent passage of RCW 39.26 reportedly may create complexities and additional lead time requirements for contracting this effort, in that the new RCW creates time requirements for publication of such contract amendments (RCW 39.26.120 and RCW 39.26.140).		an amendment of this size, and coordinate closely with the project sponsor and WSP contracting to get ahead of the curve on this, as much as possible.								been modified and approved by the project sponsors at all levels, and submitted to Motorola as a change request.
41	Scope Increase Potential Impact on Project	The project scope has increased in District 8 and District 1, to address potential coverage issues identified for the districts. This increase in scope will impact each district's	Accept	Hold a project re-planning workshop to re-estimate the project's schedule requirements, and develop a detailed impact assessment to validate the stability of the current target date for FCC compliance, or adjust	Retired	Dave Pratt	11/2/2015	11/25/2015	60%	$500,000	2 mo.	This risk was manifest. The schedule was adjusted based on the increase in project scope. The schedule was approved

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		schedule. Initial assessments of the schedule impact for the project have indicated a potential that the current FCC compliance date is safe. However, that assessment is subject to the outcome of detailed planning, which will be undertaken by the project. If this risk manifests, a potential slip in FCC compliance of 4 months is possible.		expectations to reflect a more realistic estimate.								at the project sponsor level and re-baselined.
42	End-of-Project Equipment Receipt Reconciliation	The initial receipt of equipment was inventoried and documented in 9/2012, along with the location of each piece of equipment. This information was recorded in WebWorx, WSP's equipment management system. Since that time, additional equipment has been	Mitigate	Reconcile equipment at all sites to ensure the appropriate level of accountability and ownership for all major pieces of equipment acquired by the project.	Retired	D Pratt	12/14/2015	10/10/2016	25%	$10,000	1 month	A detailed inventory and update of WebWorks was planned with Field Service Section, to be completed by end of November, 2016.

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		received under contract amendments, but has not been identified in inventory documents. As a matter of course, projects must reconcile equipment receipts with on-hand assets, to confirm that equipment has been properly received and accounted for. Since the equipment provided since contract amendment 2 has not been recorded, there is a small probability that it cannot be identified and reconciled with contract and project documentation. If that is the case, then project close could be delayed by at least 1 month during project closeout, to ensure that the reconciliation has been fully completed and documented using										

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		whatever means necessary.										
43	Academy Scope Change Potential	The project authorizes 2 console positions to support Academy training programs. The Academy currently uses 3 positions to carry out that training. To reduce the number of positions for the training would result in increased length of time for communications officer training programs, increased costs for per diem and travel, and other impacts. Communications Division and Academy Training leadership indicate that 3 console positions are a minimum requirement.	Mitigate	A business analysis is being completed to assess the situation, and will be documented. Should the need for a 3rd position be validated, a 3rd console will need to be purchased, which is not currently funded by the project. Additionally, installation of the console positions at the Academy has been addressed previously and identified electrical work that must be completed prior to installation of the consoles. This could result in additional costs. As an alternative, it may be possible to locate the consoles in Yakima and for the Academy to access console functionality virtually. This option has complexities, as well, including available internet and intranet bandwidth. Both installation options could result in an impact	Retired	Dave Pratt	2/1/2016	2/24/2016	80%	$60,000	None	Academy requirements for MCC7500 consoles was deleted per Communications Division Commander.

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				to the project schedule to acquire an additional console and finalize and complete console installation. The analysis will seek to quantify those issues and their potential impact to the project.								
44	D6 Scope Change Potential	The potential exists for the District 6 scope to increase beyond expectations. Should this happen, there would be a commensurate impact on project schedule and budget. Engineering identified Pitcher and Pickens as two potential new sites. Feedback from the field indicates a potential for Pickens not to be required. From D6 leadership, several other areas are of concern. Direction has been requested from Engineering and the Project Sponsor.	Mitigate	An assessment of the narrowband survey results for District 6 is currently being led by the project sponsor to proactively identify areas that may require remediation for the impacts of narrowbanding the district's radio communications. The results of that investigation will be compared with the results of a wideband coverage survey that is scheduled for completion in the February/March timeframe. The goal of these efforts is to identify specific remediation activities that may be required to prepare the district for cutover to narrowband communications, while	Retired	Dave Pratt	1/15/2016	7/15/2016	80%	$120,000	None	Scope Statement was developed in concert with D6 leadership, to finalize scope for cutover and post-cutover/project tasks.

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				providing the best possible communications coverage across the district.								
45	Microwave Equipment Procurement Lead time	While renewing the NASPO master contract for equipment, including microwave equipment, DES did not renew Alcatel-Nokia as a vendor on the contract. All of WSP's microwave equipment, across the state, is Alcatel. The new Maxwell 700 MHz trunked site requires microwave equipment which now must be ordered sole-source to ensure compatibility and supportability. This may extend the anticipated order and ship time for the project, and impact the project schedule.	Mitigate	Closely manage the sole source order for the microwave equipment from Alcatel-Nokia	Retired	Bob Schwent	2/1/2016	5/3/2016	90%	$41,000	1 month	Order has been expedited and should arrive well before permitting is complete, and project is ready for installation.
46	D8 Scope Change	Senior management has directed that a fourth new site be added to the project	Accept	Expedite all aspects of equipment acquisition, installation, and contract modifications to accelerate	Retired	Dave Pratt	2/18/2016	3/17/2016	100%	$160,000	3 weeks	Equipment was pulled from spares and diverted

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		scope and the D8 cutover process scope. This new site (Holy Cross) may impact the project schedule by as much as 3 weeks for D8, and impact the project budget by $65,000 to $70,000		the installation of the new site.								to new sites to expedite installation. Teams intensely managed process to install. Contract amendments have been formalized and approved to replace equipment in spares. Schedule delay was realized, although some impact was mitigated through the team's exceptional coordination and effort.
47	D6 Early Programming Initiative	The D6 Commander requested early programming of Trooper radios, so that they can coordinate during chases and travel across the state,	Mitigate	Look ahead to the programming needs of D1, D6 and D8, and include as much as possible in the D6 code plug, to mitigate the impact of the risk on the	Retired	Dave Pratt	3/29/2016	5/10/2016	75%	$0	3 weeks	The programming has gone well. Little risk remains associated with this issue.

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		with other district dispatchers. ESD and the project team worked out a plan to do this during mid-April 2016 to early May 2016, without impacting the project schedule for D1, D6 and D8 cutovers. There is a substantial risk that the code plugs for the district will change between the end of the programming effort, and when D6 will be cutover (late August 2016), and that the radios will require re-programming. If this risk manifests, then the radios will require reprogramming, resulting in no additional cost to the project, but a potential schedule impact of 3 weeks for the D6 cutover and FCC compliance.		project schedule, if at all possible.								

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48	Consolette Interface with Trunked System	There is a potential situation that exists with using control stations to access a trunked system. The issue is when the system goes into "site trunking". The probability of this occurring is pretty small. It is usually the result of a central controller failure or a major communications infrastructure failure. When this happens, the two Pierce County simulcast systems will operate in site trunking. This means that Trooper radios may be split across the two simulcast cells. This can be mitigated somewhat by programming the site preferences a bit differently, but even that approach has problems. As a result, some consideration should	Accept	Be aware of and monitor the risk.	Retired	Joe Blaske	4/21/2016	9/30/2016	15%	$0	None	Continue to be aware of the risk over time. This now becomes an operational concern, rather than a project risk.

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		be given about how to handle the situation where the system or an individual site (or simulcast subsystem) goes into site trunking. The solution usually requires a combination of operational procedures and programming.										
49	Viper 911 Project Conflict	A potential conflict with another major Communications Division project (Viper 911) both in terms of schedule and equipment room power requirements. If this risk manifests, resources required for D1 cutover could be pulled off the project, extending the project schedule for the D1 cutover.	Avoid	Escalate to Communications to avoid the conflict. Escalate to executive management, to seek support for avoiding the conflict.	Retired	Dave Pratt	5/4/2016	5/17/2016	50%	$0	1 month	Basically, Laurie will push this one out so there is only one project running. No concern at this point. Heather A. Anderson Communications Division Commander Washington State Patrol 360-704-2282
50	Insufficient Power in D1	Technicians have identified the potential for insufficient power	Mitigate	Escalate to ESD Engineering for an assessment, and then	Retired	Lynn Whitesell	5/5/2016	5/11/2016	50%	$20,000	1 month	ESD Engineering assessed the

Risk ID#	Title	Risk Description	Risk Mgmt. Strategy	Risk Mgmt. Plan	Risk Status	Submitted By	Date Opened	Date Closed	Likelihood of Occurrence	Impact Cost	Impact Schedule	Risk Outcome
	Equipment Room	available in the District 1 equipment room, to meet project needs and other priority State Patrol initiatives. Additionally, the Viper 911 project will require power in the equipment room, creating additional complications. If manifest, this could result in a delay in the D1 cutover schedule and an increase in project cost, required to bring in an electrician and upgrade the power.		reassess once the results of that assessment are available.								power requirements and found them to be sufficient for the needs of the project.
51	Headquarters Training and Reprogramming	The complexity associated with training Troopers and reprogramming Trooper radios for a diverse group of non-district personnel in the Headquarters/D10 area could impact the project schedule.	Accept	A lieutenant was assigned to coordinate directly with Lynn Whitesell, to expedite the process and provide leadership ownership.	Retired	Lynn Whitesell	5/5/2016	7/25/2016	99%	$0	None	This risk is manifest in a minor manner, in that 12 GA Troopers have yet to have their radios programmed. All else have complied. Thi

Risk ID#	Title	Risk Description	Risk Mgmt. Strategy	Risk Mgmt. Plan	Risk Status	Submitted By	Date Opened	Date Closed	Likelihood of Occurrence	Impact Cost	Impact Schedule	Risk Outcome
												s risk can be retired.
52	Maxwell Site Permitting - D1	Extensive Thurston County permitting requirements for the new Maxwell site, and our ability to influence that process to retain the current project schedule are subject to risk. Thurston County permitting process require at least 58 days. If that period is extended by the county, the D1 cutover schedule will slip on a day-by-day basis until the permitting process is completed by the county.	Mitigate	Eric Felch will monitor the county's progress closely, but WSP is unable to influence this risk in any way.	Retired	Eric Felch	4/11/2016	5/26/2016	75%	$0	1 month	Schedule was re-baselined to accommodate the risk.
53	Resource Availability during D1 Cutover	Because of the new schedule for cutover, the event takes place in August, which is the most vacationed month of the year. It also takes place in direct conflict with the Academy Project, which may consume the projects technical	Mitigate	Address potential schedule conflicts and resource limitations and project the potential impact on the project timeline.	Retired	Lynn Whitesell	6/16/2016	7/21/2016	0%	$0	None	Field Service Supervisor scheduled resources to complete competing tasks, along with project tasks, without impact to the project.

Risk ID#	Title	Risk Description	Risk Mgmt. Strategy	Risk Mgmt. Plan	Risk Status	Submitted By	Date Opened	Date Closed	Likelihood of Occurrence	Impact Cost	Impact Schedule	Risk Outcome
		resources, the delay of which may ripple through the Motorola task schedule. This is identified as a risk.										
54	Hart Road Remediation Timeline	The repair of the Hart Road site is a requirement for D6 cutover. There is a probability that the site may not be fixed in time to support the D6 cutover timeline, of starting on September 19, due to the receipt of equipment. If this risk manifests, it could slip the schedule by 1 to 2 weeks.	Mitigate	Eric F. to work with vendor to expedite shipment of equipment. Power supply backup has been arranged with WSDOT by WSP Engineering, since that piece of equipment is on significant backorder. Schedule work with Field Service and Tower Crew with sufficient time to get the work completed and support D6 cutover.	Retired	Dave Pratt	8/11/2016	9/16/2016	40%	$15,000	2 weeks	Hart Road issues with the microwave link were resolved through collaboration with WSDOT resources.
55	Narrowband Analog Voting in D6	Motorola has identified a risk that voting may not work correctly with the narrowband analog sites installed in the Okanogan and Wenatchee areas of D6. This will be the first time that Motorola has designed a narrowband analog	Mitigate	WSP to parallel the narrowband analog sites, so that Motorola can test the voting in advance of cutover. Motorola to develop and publish a procedure for validating the effectiveness of the voting in the narrowband analog areas of D6	Retired	Mark Vetsch; Bob House	8/25/2016	9/30/2016	70%	$0	30 day	Voting was observed and found to be working as intended.

Risk ID#	Title	Risk Description	Risk Mgmt. Strategy	Risk Mgmt. Plan	Risk Status	Submitted By	Date Opened	Date Closed	Likelihood of Occurrence	Impact Cost	Impact Schedule	Risk Outcome
		solution, and voting has not yet been proven. If this risk occurs, the cutover of D6 could be put at risk entirely, or for a period of time as the voting technology issue is researched and remediated.										

Appendix C – Project Change Control Log

Table 14 - Change Control Log

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
1	Conventional Testing	Motorola will complete and document the results from the analog vs. digital subjective testing in Gold Mountain. Motorola will conduct an additional analog vs. digital survey including subjective testing in the Port Angeles area.	Completed	10/29/2013	Blair Vincent	10/29/2013	$0	None	5/5/2014
2	Text Requirement Deletion	Remove the requirements for texting capability from the P25 contract.	Cancelled	11/25/2013	Robert Schwent	11/25/2013	$0	None	2/13/2015
3	APX Tech Subscriber Academy Session Training	Completed and paid for under Motorola change order #7. This training addresses how to repair the portable radios. If WSP repairs the radios within the next year or so, they would potentially violate radio warranty. If the decision were to repair the radios once the warranty has expired, then the knowledge will have perished well before it might be needed. This class should be canceled, since WSP personnel will not likely be working on the subscribers in the near future, if at all. The cost to ship radios back for repair, compared to setting up and staffing a depot repair center does not justify the expense. Additionally, field personnel do not have the time, equipment, or facilities to work at the depot level.	Completed	1/9/2014	Mark Vetsch	1/9/2014	$60,000	None	6/2/2014

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
4	Radio Screen Plain Speak Display	The purpose of this Change Request is to reconfigure the displays of the radio displays so that users/Troopers can intuitively identify whether they are in P25 conventional or Trunking, and to which Trunking system they are currently connected. Final request submitted for approval on 5-8-14 to include the following: C Area Name = Conventional System T Area Name = Trunked System Training MUST be updated to reflect this change.	Completed	1/31/2014	AC Shaun Berry	6/12/2014	$0	None	7/3/2014
5	Communications Command Training	Completed and paid for under Motorola change order #7. The purpose of this change request is to document a training requirement for the district Communications Command operations, as impacted by the new P25 conventional and trunking systems.	Completed	1/31/2014	Mark Vetsch	1/31/2014	$66,360	None	6/2/2014
7	Console Dropdown Menu Elimination	It is the expressed desire of WSP to convert the simplex area control method over to the method used by the repeated areas. This change request identifies how that will be accomplished, but requires estimation.	Completed	2/15/2014	Mark Vetsch	2/15/2014	$228,277	3 months	3/28/2015
6	Interoperability Radio Augmentation	Current plans for the P25 Narrow Band Project include a single mobile radio to be installed in each State Patrol vehicle, with the ability to utilize P25 Conventional and Trunking narrow band capabilities. While in trunking mode, those radios	Disapproved	3/13/2014	District Commanders	3/13/2014	$0	None	8/4/2014

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
		are incapable of monitoring local frequencies to support interoperability requirements with local jurisdictions. Many of the districts feel that the lack of this capability threatens their ability to support operations in their direct areas and requires remediation. The goal of this change request is to document this issue and estimate the cost of remediation. This has been escalated to the Executive Project Sponsors for consideration.							
8	Channel Markers for Emergency Tones	The intent of this change request is to modify the current P25 Narrow Band Project approach and technology to allow channel markers to be applied to multiple frequencies during a pursuit or emergency situation, at the console level, so that emergency signals are broadcast over those frequencies and the frequencies can be kept clear for use by those involved in the situation. Costs were incorporated in Motorola response to CR #7.	Completed	3/20/2014	Mark Layhew	3/20/2014	$0	2 months	2/2/2015
9	Fleet Map Changes	The intent of this change request is to correct errors in the code plug and configure the tactical talk groups to revert to the first channel in the zone on emergency rather than staying on the tactical talk group.	Completed	4/25/2014	Mark Vetsch	4/25/2014	$0	None	7/3/2014
10	Kelso Area Coverage	Restore lost coverage in the Kelso area which resulted after the change to P25 digital operation.	Completed	5/8/2014	Bob Schwent	5/8/2014	$16,000	None	3/20/2015
11	Sharkee Antenna Configuration	The Sharkee antenna combines the 700MHz, VHF, and GPS antennas into one low profile antenna solution. It has been determined through	Completed	6/4/2014	Mark Vetsch	6/4/2014	$8,000	None	10/22/2014

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
		field testing that many complaints by system users are due to the poor performance of the VHF antenna provided as part of this solution. An alternative configuration has been identified and field tested in D3 with very positive results. This configuration utilizes the 700 MHz and GPS capabilities of the Sharkee antenna while breaking the VHF antenna out to a black ¼ wave 18".							
12	Academy Console Site Change to Support Disaster Recovery	Install the Academy backroom equipment at Yakima Ridge instead of the Academy radio site. Equip it with spares so it can be used to support a failure anywhere in the system and provide backup functionality in the event of a catastrophic failure.	Disapproved	6/10/2014	Ron Gardiner	6/10/2014	$0	None	2/2/2015
13	District 2 Trunking Capacity Expansion	The goal of this change request is to identify the capability and costs required to expand the trunking capacity within WSP's District 2.	Completed	7/7/2014	Dave Pratt, vice Bob Schwent	7/7/2014	$0	None	7/17/2015
14	P25 Narrow Band Project Historical Reporting Tool Training	The goal of this change request is to increase the scope of the P25 Narrow Band Project to add training for specific Communications Division and Electronic Services Division personnel, so that they can take advantage of Motorola's Historical Report too, provided as part of the P25 Narrow Band Project. Current plans include providing familiarity with this tool to only a single individual (Ron Gardner) on an informal, as needed basis. Communications indicated that they did not require additional reports.	Cancelled	8/1/2014	Dave Pratt	8/1/2014	$0	None	10/1/2014

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
15	Console Operator Refresher Training	The goal of this change request is to provide refresher console training for 8 console operators, and train-the-trainer console operators from WSP, to ensure that their training is current and that they are ready to operate the new trunking and P25 Narrow Band Conventional System upon district cutover.	Completed	8/12/2014	Dave Pratt, Mark Layhew	8/11/2014	$4,300	None	9/18/2014
16	Mobile Front Panel Button Change and Add WB zones to Pilot Codeplug	Enhance Subscriber experience with controls and zones as well as proper emergency button operation during Pilot and Cutover.	Completed	8/12/2014	Randy Robinson	8/12/2014	$0	None	9/29/2014
17	Console Resource Name Change to Match Radio Channel Names	Currently the console resources names (alias) are different than what is in the radios. This presents the possibility for confusion in that a dispatcher could request a trooper to go to a channel based on what is seen on their screen which uses a different naming scheme than the radios do. 10-20-2014: Resolved through database update.	Cancelled	9/24/2014	Ron Gardiner	9/2/2014	$0	None	10/20/2014
18	UID Meaningful Information	Enhance the Reliability of the unit identifiers on the console display during emergency button activation and normal operation. 10-20-2014: Resolved through database update.	Disapproved	9/24/2014	Rob Ramsey	8/27/2014	$0	None	10/20/2014
19	Production Support Resource Requirement	The goal of this change request is to estimate the cost of acquiring a system manager resource, to augment the WSP system administrator capabilities required to support the P25 Narrow Band Project technical solutions for WSP's districts, across the state. The objective of this change request is to resolve that point of failure	Cancelled	9/25/2014	Dave Pratt, vice RS and MV	9/25/2014	$0	None	5/12/2015

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
		issue during the critical, work-intensive period of time when the project is in production in some districts, and in development and implementation (project mode) in others, effectively doubling the resource's work responsibilities. This requirement is on hold due to lack of funding, but identified as a project risk.							
20	Crescent Bar Coverage Enhancement	The goal of this change request is to provide radio coverage in the Crescent Bar area of District 6. Coverage was identified through an alternate site. No action required.	Cancelled	10/9/2014	Bob Schwent	10/6/2014	$0	None	2/3/2015
21	Grant County Interoperability	The goal of this change request is to add Grant County talkgroups to WSP portable radios, and to install a control station on the grant county system in the WSP Moses Lake detachment office. This was determined to be a non-project issue, and is being managed currently by ESD. This is on hold as issues are worked with Grant County.	Cancelled	10/9/2014	Bob Schwent	10/6/2014	$0	None	11/25/2015
22	Pierce County Interoperability	The goal of this change request is to add Pierce County talkgroups to WSP portable radios.	Cancelled	10/9/2014	Bob Schwent	10/6/2014	$0	None	1/13/2015
23	Tacoma Area Repeater	The goal of this change request is to change the Tacoma Freeway area frequency from simplex to a repeater operation to address the P25 simplex collision issue. This was determined to be beyond the scope of	Cancelled	10/9/2014	Bob Schwent	10/6/2014	$0	None	3/3/2015

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
		the project, and handled through operations activities.							
24	Seattle Pass Talk Group Addition	Add a talk group for District 2 on the IWN sites to cover the area from Preston to the summit of Interstate 90. Additionally, add a car-to-car talk group for this same area on the same IWN sites.	Completed	10/15/2014	Mark F Vetsch	10/15/2014	$0	None	10/17/2014
25	Move the District 2 Prime Site	ESD Engineering has assessed the available sites to move the Prime Site in question to a more robust location therefor improving reliability of the 700 MHz Simulcast Cell 1 of the WSP system. It is our recommendation to move the Prime equipment to the Bothell 700 MHz site from Cougar Mt. Adequate power, HVAC, and most importantly East and West bound MPLS MW connectivity is available. We are requesting that Motorola asses the impacts to the project for further consideration.	Cancelled	10/16/2014	Mike Geiger	10/16/2014	$0	None	2/3/2015
26	Code Plug Test Augmentation	To provide resources and expertise necessary to test WSP's current version of the code plug for mobile and portable radios, for District 2 cutover. This support is needed immediately.	Completed	10/23/2014	Dave Pratt	10/23/2014	$39,635	None	11/20/2014
27	V.24 Link Error Causative Research	The purpose of this change request is to acquire a skilled technical resource from Motorola, to participate as part of a collaborative trouble shooting team with WSP, to investigate V.24 link errors, identify the root cause of the errors, and develop specific plans for remediation. Cancelled April 16, 2015 per discussion between Motorola, WSP Engineering and Project Management.	Cancelled	11/4/2014	Dave Pratt	11/5/2014	$0	None	4/16/2015

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
28	Console Operator Refresher Training – All District Communications Centers	The goal of this change request is to provide refresher console training for 4-6 console operators at each WSP district, immediately prior to cutover of those districts to the P25 Narrowband communications systems. This training will ensure that their training is current and that they are ready to operate the new trunking and P25 Narrow Band Conventional System upon district cutover. Note that this training was conducted previously, in District 2 (Bellevue), on September 2, 2014. Retraining of District 2 personnel is excluded from the scope of this change request.	Cancelled	1/8/2015	Mark Layhew	1/9/2015	$21,000	None	3/2/2015
29	Power Upgrade for 700 MHz Site Channel Expansion	Four of the sites, King Lake, Squak BPA, Indian Hill, and VA Hospital, need upgrades to the -48VDC power plants. King Lake and VA Hospital require additional rectifiers. Squak BPA also needs an additional rectifier and additional batteries. At Indian Hill, the increase in DC load requires the rectifier system be replaced with one capable of a higher load and requires additional batteries.	Completed	2/13/2015	Eric Felch	2/13/2015	$8,625	None	5/21/2015
30	Implement Spokane Area Talk Group for District 4	The goal of this effort is to set up access to the Spokane County trunked system's Spokane Area Talk Group for use by WSP Troopers. A consolette will be set up and integrated with the Spokane County trunked system, and linked to WSP's District 4 (Spokane) dispatch consoles as a resource that can be monitored. The link will be established so that Trooper identity information will be transmitted to dispatch when	Completed	4/8/2015	D Pratt, vice R Schwent	4/8/2015	$14,102	None	5/22/2015

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
		communications are taking place and when an emergency button is activated by a Trooper on that talk group.							
31	District 2 Site Optimization Analysis and Recommendations	The goal of this change request is to acquire the services of the P25 Narrowband Project vendor, Motorola, to leverage their understanding of the district's existing 700 MHz and DOJ/IWN trunked system, to develop a plan that optimizes the use of those sites and additional IWN sites that are available to the district. The objectives of this change requests include: 1. Optimize the coverage provided to District 2 Troopers and others through use of the best possible mix of 700 MHz and IWN sites available to support communications in the district. 2. Specific recommendations that address, among other issues, site coverage benefits and interdependencies and configuration requirements, procedures and processes for implementing those recommendations, and risks associated with making the recommended changes. 3. Provide documentation that identifies the approach used to complete the analysis and develop the recommendations, which can serve as a template for future analyses carried out by WSP resources.	Cancelled	4/10/2015	D Pratt, vice R Schwent et al	4/17/2015	$0	None	5/5/2015
32	Establish Recording of Analog Radio Channels with	In order to use the NICE recording system with the old radio system, we must connect to the NICE NPX logger at the district's office. To record the traffic we will need additional licenses	Cancelled	5/14/2015	Mark Layhew, vice Ron Gardner	5/14/2015	$0	None	8/12/2015

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
	NICE NPX Logger at Wenatchee District	to enable the ports on the NPX to record the required channels. NICE's sales engineer Kevin Wolter has been contacted and he says that he will provide a quote to Motorola for a license increase (one license covers 8 channels), for Motorola to provide to us. We will need at least 2 to give us the ability to record 20 channels.							
33	Document Scope Changes for Project Training	The purpose of this no-cost change request is to document training and orientation sessions that Motorola has committed to providing in conjunction with the P25 Narrowband Project.	Completed	7/21/2015	Randy Covert, Motorola PM	7/21/2015	$0	None	2/16/2016
34	Skokomish and Stevens Pass Base-Repeater Operations Code Plug Change	This purpose of this change request is to document changes to the code plug, made to ensure the appropriate configuration of the code plug to support Skokomish and Stevens Pass base station and repeater operations.	Completed	8/11/2015	Mark Vetsch	8/11/2015	$0	None	11/3/2015
35	Project Schedule Modification to Support WSP Operational Needs	The goal of this change request is to document a significant slip in the project schedule, which has resulted from critical operations considerations that arose during the timeframe planned for the cutover of District 7.	Cancelled	8/24/2015	Dave Pratt	8/24/2015	$0	30 days	8/26/2015
36	Audio Availability in District and Detachment Offices	The goal of this change request is to secure the design and implementation of a solution to provide audio monitoring of WSP's radio systems in district squad rooms or detachment offices.	Cancelled	9/28/2015	Mark Vetsch, Ron Gardner	9/28/2015	$0	None	11/2/2015
37	New Site Installation Requirements v.4	The goal of this change request is to expand the scope of the P25 Narrowband Project contract with Motorola to incorporate the purchase of the equipment necessary for WSP to install four new sites in WSP's Districts 2 and 8, to enhance and	Approved	10/5/2015	Bob Schwent	11/17/2015	$150,403	4 months	

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
		remediate P25 conventional radio coverage issues in those areas.							
38	Equipment and Limited Services for 3 VHF Transmission Sites	The goal of this change request is to expand the scope of the P25 Narrowband Project contract with Motorola to purchase the equipment necessary for WSP to install 3 new VHF transmission sites, at Cosmopolis and two sites at locations to be named later. These additional sites are required to remediate P25 conventional radio coverage issues in District 8 (Bremerton). WSP technicians will do all installation and planning. The vendor will provide limited services necessary to integrate the new resources into WSP's system and consoles.	Cancelled	10/30/2015	Dave Pratt, vice Bob Schwent	10/30/2015	$0	None	11/17/2015
39	Implement Pierce Talk Groups for District 1	The goal of this effort is to set up access to the Pierce County trunked system's Tacoma East and West Talk Groups for use by WSP Troopers. Two consolettes will be acquired, set up and integrated with the Pierce County trunked system and linked to WSP's District 1 (Tacoma) dispatch consoles as resources that can be monitored. The link will be established so that Trooper identity information will be transmitted to dispatch when communications are taking place and when an emergency button is activated by a Trooper on that talk group.	Completed	11/17/2015	Bob Schwent	11/17/2015	$0	None	2/1/2016
40	P25 Narrowband Project Re-baseline	The purpose of this change request is to document the update of the project schedule developed mutually by Motorola and WSP, in response to a significant expansion of project scope, driven by WSP. The updated schedule will replace past	Completed	11/23/2015	Dave Pratt	11/23/2015	$0	5 weeks	2/12/2016

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
		versions of the document, and allow Motorola to update their internal systems for tracking project milestones.							
41	700 MHz Trunked Expansion for District 1 and District 8	Establishment of a single 700MHz TDMA trunked radio site and antenna system at the Maxwell site, as described in the change order provided by Motorola. This change will enhance narrowband radio communications coverage in the District 1 and District 8 areas.	Completed	11/24/2015	Bob Schwent	11/24/2015	$424,893	4 to 7 months	8/19/2016
42	ISSI Connection Establishment	The purpose of this change request is to obtain Motorola's services for the installation of a P25 Inter-RF Subsystem Interface (ISSI) connection with the Pierce Transit-Pierce County (PTPC) Combined Communications Network (CCN), in accordance with the draft System Access and User Agreement executed between Pierce County and WSP. This connection will provide WSP with enhanced coverage in the Tacoma East and West areas, and along Interstate 5, which will significantly improve radio communications in those areas by leveraging PTPC's trunked CCN radio communications system.	Completed	12/30/2015	Dave Pratt vice Bob Schwent	2/29/2016	$42,288	None	11/30/2016
43	Warranty Clarification	This change request is submitted in accordance with Section 3.2 of the basic contract, referenced above, and modifies sections 9.2 and 10.2 of the contract. This amendment applies to equipment received by WSP from Motorola under the provisions of the basic contract, its Statement of Work and Amendments 1 and 2, which have not been installed and/or put into service as of the	Completed	1/20/2016	Dave Pratt	1/20/2016	$0	None	2/12/2016

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
		date of this amendment and as part of a district cutover process. For those items of equipment, the warranty will expire January 1, 2017.							
44	Enable SWAT Talkgroup Statewide	WSP SWAT Team is requesting the SWAT talkgroup be enabled statewide to provide real time information to responding officers.	Completed	2/3/2016	Mark Vetsch	2/3/2016	$0	None	2/23/2016
45	Maxwell and Capitol 700 MHz Site Realignment with Pierce County	The goal of this change request is to investigate and potentially implement a change in the WSP 700 MHz trunked system, to realign the Capitol Peak and new Maxwell 700 MHz trunked sites with the Pierce County & Pierce Transit trunked system, and interface that system with WSP's own system. The objective or value provided by this change would be elegant, seamless communications for District 1 and District 8 resources across the districts, and expanded coverage for WSP Troopers.	Cancelled	2/22/2016	D Pratt, vice Bob Schwent	2/22/2016	$0	None	3/3/2016
46	District 8 Holy Cross Transmission Site	Holy Cross has been identified by WSP command staff as a necessary transmission site addition, to provide radio coverage within District 8, to ensure Trooper and public safety. Based on direction by WSP senior management, that site has been added to the project scope and must be incorporated into the project budget and schedule baseline. The goals and objectives of this change request include the estimation of the impact of this scope change, and development of a plan to ensure that timely implementation of the Holy Cross site.	Completed	2/25/2016	Bob Schwent, Project Sponsor	2/25/2016	$34,450	3 weeks	4/29/2016
47	MCD5000 with OMC Technical Workshop	The objective of this training is to provide a workshop for field service and engineering technicians regarding the installation,	Completed	5/9/2016	Mark Vetsch	5/9/2016	$11,927	None	9/9/2016

CR #	Title	Description	Status	Created	Submitted By	Date Submitted	Cost Impact	Schedule Impact	Date Completed
		configuration, troubleshooting, maintenance and/or support of Motorola MCD500 units. This training is critical for the ongoing support and maintenance of WSP communications equipment.							
48	P25 Narrowband Project Schedule Re-Baseline	The goal of this change request is to document the re-baselining of the schedule for the P25 Narrowband Project.	Completed	5/25/2016	Dave Pratt	5/25/2016	$0	1 month	7/1/2016
49	District 6 New Site Installation Requirements and Consolette Design	The goal of this change request is to expand the scope of the P25 Narrowband Project contract with Motorola to incorporate the purchase of the equipment necessary for WSP to install two new sites in WSP's District 6, to enhance and remediate P25 conventional and Narrowband Analog radio coverage issues in that district. Additionally, Motorola will "design in" the use of a consolette to connect the WSP system in District 6 to the Grant County (MAC) system. This effort does not include the purchase and installation of the consolette, which will be handled directly by WSP.	Completed	7/1/2016	Dave Pratt, vice Bob Schwent	7/1/2016	$50,000	None	9/16/2016