Alaska Land Mobile Radio Communications System

Total Cost of Ownership Study

Final Version

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Total Cost of Ownership Study
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Alaska Land Mobile Radio Communications System
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Executive Summary

The Alaska Land Mobile Radio (ALMR) Communications System, hereinafter referred to as the System, is a digital trunked, wide–area network, shared communication system that has been implemented and is being operated under a Cooperative Agreement between the principal stakeholders: the U.S. Department of Defense (DOD), the State of Alaska (SOA), and the Federal Executive Association (FEA) of Alaska. The ALMR stakeholders are executing an interoperability communication strategy that ensures ALMR is operated in compliance with the U.S. Department of Homeland Security (DHS) guidelines. The principal objective of ALMR is to provide reliable, on-demand and in real time, secure interoperable communications for emergency responders in Alaska across federal, state, and local government agencies. ALMR supports multi-agency/multi-jurisdictional public safety responses to mutual aid, emergency and medical response situations, while also meeting day-to-day land mobile radio communications needs. ALMR was implemented and is operated in accordance with standards established and endorsed by the Association of Public Safety Communications Officers (APCO) for first responder communications interoperability.

The primary objective of this document is to identify and quantify future ALMR operations and maintenance (O&M) costs. These future costs are then further classified into those that are candidates to be shared by all System users and those that will be paid solely by the agency that incurs them. All future ALMR O&M costs are driven by the level of service defined in the ALMR Service Level Agreement (SLA)[1] and have been quantified through competitive contracts with third party service providers.

The second objective of this document is to put future O&M costs into context with those for similar systems. This was accomplished via a limited benchmarking analysis of five other statewide systems. Information regarding construction costs, numbers of sites, annual operating costs, and staffing levels were examined. This was not an effort designed to define detailed metrics. Rather, it established ranges of values against which those like values for ALMR can be compared.

The final objective is to document the historical cost of the System from the time construction began through June 30, 2008. All stakeholders were involved in the acquisition and installation of the ALMR infrastructure and the associated handheld and mobile radios, to some extent. This document details these cooperative contributions.

[1] The Service Level Agreement (SLA) was developed by the operational users of the System. The SLA defines the system components as shared maintained assets or agency owned/maintained assets. The SLA also defines the level and quality of service at which the System must be maintained to meet operational needs. Draft Service Level Agreement, Version 1, dated February 26, 2008.

To assist the stakeholders in achieving these three objectives, Wostmann & Associates, Inc. (WAI), in conjunction with Homeland Security Consulting (dba 5 Star Team) and MGT of America, Inc., were commissioned to conduct this Total Cost of Ownership (TCO)[2] study of ALMR shared infrastructure under the governance of the Executive Council. The scope of the TCO does not include the determination of the amount of costs to be shared or funded by each stakeholder, or the method for determining each stakeholder's share of ALMR O&M costs. This is a governance responsibility of the ALMR Executive Council, and will be reflected in a Cost Share Agreement executed among the stakeholders.

Study Process and Approach

The TCO was conducted through a series of meetings with ALMR stakeholders, the review of existing information on ALMR, the provision of information, and the completion of surveys by ALMR stakeholders. Meetings were held with ALMR stakeholders initially, during data gathering and analysis tasks, and also during the review of draft reports. Prior reports, audits, minutes of Executive Council and User Council meetings, draft and final versions of the Cooperative Agreement and the SLA, and other documents were obtained and reviewed. Cost information was obtained from each stakeholder and projected for the seventeen-year lifecycle[3] of the System infrastructure beginning July 1, 2008. The validation or audit of the data provided by the stakeholders was not within the scope of the TCO, or the responsibility of WAI and the other firms participating in the development of the TCO. Study results are based on the cost information available at the time the TCO was developed.

Costs associated with the management and O&M of the ALMR shared infrastructure have been and are to be, shared by the principal stakeholders as defined in the SLA. Costs associated with user communications components[4] are to be borne by each user also in accordance with the SLA. To date, DOD and the SOA have shared in the implementation costs of the ALMR shared infrastructure[5]. It is not anticipated that costs incurred by the DOD and the SOA in the implementation of their agreed upon responsibilities for deployment of ALMR shared

[2] This is the second TCO conducted for the ALMR Executive Council. The first TCO was conducted in March 2005 by Marketing Strategy Group. It captured the costs of operating the legacy LMR systems of the stakeholders and provided an in-depth analysis of the projected costs of implementing the shared system infrastructure. It did not examine the cost of operating and maintaining the shared System.

[3] The manufacturer of the equipment defines the lifecycle as the time in which replacement parts and software upgrades will be made available and after which infrastructure may not be repairable. The system, if properly maintained, will still function for many years after the end of its lifecycle.

[4] User communications components include subscriber equipment, which is defined as the instruments that the user directly operates and interfaces with to execute communication over the System. Examples are hand held radio units, mobile vehicle units, consoles, consolettes, key management equipment, radio programming devices etc. User communications equipment also includes in-building repeaters, the deployable system and other equipment and services that do not benefit all System users.

[5] This pertains to the initial system design and infrastructure build out, to date. The Municipality of Anchorage (MOA) is solely funding the infrastructure build out of the Anchorage Wide Area Radio Network (AWARN), which will function as a part of ALMR in a zone configuration.

infrastructure will be recaptured through any future cost share approach. However, it is anticipated that all ALMR users will share in the management and O&M costs of the ALMR shared infrastructure[6] over the anticipated seventeen year lifecycle of the system.

Although the TCO provides both shared infrastructure and user specific costs, only costs associated with shared infrastructure components have been verified by the stakeholders. Significant effort has been expended by the stakeholders in determining all historical and projected costs related to shared infrastructure components presented in the TCO. Cost information associated with infrastructure and communication equipment only benefiting a specific entity, or group of entities, was not provided by several municipalities and federal agencies[7]. In those cases, the information was estimated.

Costs identified in the TCO include but are not limited to costs of procurement, site preparation, construction, implementation, program management, transition, cutover, upgrades; and annual costs associated with managing, operating, and maintaining the ALMR shared infrastructure. TCO costs do not include depreciation, or an allowance for the replacement of equipment and other capital costs. Federal funding policies require the funding of equipment and implementation costs from capital appropriations and not from annual operating and maintenance funds. In the TCO equipment category, implementation, and other capital costs have been identified as one-time costs in the year they were incurred, and also in the year they may need to be replaced or upgraded.

System Components

System component information was derived from the SLA and through meetings and discussions with stakeholders. ALMR is comprised of shared infrastructure equipment and user communications components, which are further divided into shared and non-shared costs throughout this TCO.

Shared infrastructure components are components essential for the operation of the System and which benefit all System users. Shared infrastructure costs include engineering designs, site preparation, the procurement of the equipment, management of the project, and other associated costs.

[6] As of this writing, the consensus of the stakeholders is that infrastructure owners will continue to fund the cost of maintaining and servicing their owned infrastructure equipment. Services associated with circuit backhaul, system management and operations management of the shared infrastructure will be shared among all stakeholders. The final determination of cost share approach, methods and resulting stakeholder costs will be provided through the Cost Share Agreement.

[7] Information was provided by DOD, SOA, MOA, Bureau of Land Management, FAA Fairbanks, Fairbanks Fire Department, Homer Police Department, McKinley Volunteer Fire Department, Rural Deltana, Volunteer Fire Department, Soldotna Police Department and Valdez Fire Department. Costs for those not completing the surveys were estimated based on the number of radios registered on the System.

User communications components benefit only one user, or a small group of users. Included in this category is subscriber equipment (handheld radios, mobile vehicle-mounted radios, consoles, and consolettes), as well as radio gateway equipment, bi-directional amplifiers, key management consoles, and network management console equipment.

Historical Cost and Funding

The ALMR stakeholders have expended approximately $100 million dollars on the management, implementation, operation, and maintenance of ALMR shared infrastructure through June 30, 2008 (FY 2008), and approximately $95 million dollars on user communications components[8]. A total commitment has been made of over $195 million dollars in the establishment of a DHS-compliant, reliable, and secure interoperable communications system in Alaska. Approximately 72 percent of the funding of the total System cost incurred through FY 2008 has been federally funded. Table II.1 provides a summary of ALMR-related costs and funding through FY 2008, broken down by federal and state/local funding.

Table II.1
System Components
Costs and Funding Through June 30, 2008
(In thousands)

Components	Costs		Federal Funding		State/Local Funding	
	Total	Percent	Amount	Percent	Amount	Percent
Shared Infrastructure	$ 99,538	51.00%	$ 65,835	66.14%	$ 33,703	33.86%
User Communications Components	95,635	49.00%	74,909	78.33%	20,726	21.67%
Total	$ 195,173	100.00%	$ 140,744	72.11%	$ 54,429	27.89%

[8] The $95 million covers all subscriber equipment costs. In addition, this figure also includes the cost of the AWARN infrastructure. AWARN services the MOA agencies operating autonomously on AWARN. Technically, the connection of AWARN as a zone on the ALMR shared infrastructure extends seamless interoperable communications between users on ALMR and users on AWARN when those users are operating in areas mutually covered by both ALMR and AWARN.

Cost and Funding Summary by Stakeholder

As of the end of FY 2008, of the costs associated with ALMR shared infrastructure components approximately 66 percent has been federally funded[9]. All ALMR users have incurred costs for the acquisition and implementation of subscriber equipment, of which approximately 80 percent has been federally funded[10]. Table II.2 provides the costs incurred by each of the ALMR stakeholders and the source of funding they utilized to fund their costs.

Table II.2
System Components by Stakeholder
Costs and Funding Through June 30, 2008
(In thousands)

	Costs		Federal Funding		State/Local Funding	
Components/Stakeholders	**Total**	**Percent**	**Amount**	**Percent**	**Amount**	**Percent**
Shared Infrastructure						
U.S. Dept. of Defense	$ 47,628	47.85%	$ 47,628	100.00%	$ -	0.00%
State of Alaska	51,910	52.15%	18,207	35.07%	33,703	64.93%
Subtotal	$ 99,538	100.00%	$ 65,835	66.14%	$ 33,703	33.86%
User Components						
U.S. Dept. of Defense	46,057	48.16%	46,057	100.00%	-	0.00%
Other Federal Agencies	2,176	2.28%	2,176	100.00%	-	0.00%
State of Alaska	13,606	14.23%	-	0.00%	13,606	100.00%
Municipality of Anchorage	23,046	24.10%	16,050	69.64%	6,996	30.36%
Other Alaska Local Entities	10,750	11.24%	10,626	98.85%	124	1.15%
Subtotal	95,635	100.00%	74,909	78.33%	20,726	21.67%
Total	$ 195,173		$ 140,744		$ 54,429	

[9] 100 percent of DOD contributions have been federally funded, 35.07 percent of the SOA costs have been federally funded.

[10] This total includes both the subscriber equipment and the infrastructure costs for the MOA. AWARN infrastructure is not part of the ALMR shared infrastructure, and therefore is considered user communications components for cost determination purposes of this TCO.

Shared Infrastructure by Cost Categories

As illustrated in Table II.3, the principal shared infrastructure category through FY 2008 is site implementation[11], representing approximately $71 million dollars which is 71.7 percent of the total shared infrastructure costs. Approximately $41 million dollars (57.03 percent) of these costs were federally funded. Table II.3 also provides the costs incurred for every other shared infrastructure cost category, and the source of funding.

Table II.3
Shared Infrastructure Components
Costs and Funding Through June 30, 2008
(In thousands)

Cost Category	Costs		Federal Funding		State/Local Funding	
	Total	Percent	Amount	Percent	Amount	Percent
Project Oversight	$ 378	0.38%	$ 56	14.81%	$ 322	85.19%
Project Management Support	2,399	2.41%	1,035	43.14%	1,364	56.86%
Operations Management	2,271	2.28%	2,271	100.00%	-	0.00%
Studies and Reports	3,157	3.17%	3,157	100.00%	-	0.00%
Statewide Exercise Support	1,811	1.82%	1,811	100.00%	-	0.00%
Site Implementation	71,510	71.84%	40,704	56.92%	30,806	43.08%
System Upgrades	5,962	5.99%	5,962	100.00%	-	0.00%
System Management and Maint.	11,339	11.39%	10,839	95.59%	500	4.41%
Circuit Usage	711	0.71%	-	0.00%	711	100.00%
Total	$ 99,538	100.00%	$ 65,835	66.14%	$ 33,703	33.86%

[11] Site implementation includes the costs associated with engineering (system analysis/system design), procurement of the equipment, site preparation, training and exercises, development of standard operating procedures, operational testing and evaluation (OT&E), etc.

User Communications Components by Cost Category

The principal cost categories on which ALMR costs have been expended for user communications components have been approximately 78 percent federally funded[12] as illustrated in Table II.4.

In total, approximately 79 percent of subscriber equipment costs have been federally funded. Table II.4[13] provides, by cost category, the costs incurred for user communications components and the source of funding for these costs.

Table II.4
User Communications Components
Costs and Funding Through June 30, 2008
(In thousands)

Cost Category	Costs		Federal Funding		State/Local Funding	
	Total	Percent	Amount	Percent	Amount	Percent
Project Management Support	$ 5,105	5.34%	$ 4,927	96.51%	$ 178	3.49%
Operations Management	50	0.05%	50	100.00%	-	0.00%
Studies and Reports	1,853	1.94%	1,853	100.00%	-	0.00%
Site Implementation	16,585	17.34%	9,051	54.57%	7,534	45.43%
System Upgrades	1,950	2.04%	1,950	100.00%	-	0.00%
System Management and Maint.	1,347	1.41%	1,309	97.18%	38	2.82%
Deployable System	8,046	8.41%	8,046	100.00%	-	0.00%
Circuit Costs	50	0.05%	-	0.00%	50	100.00%
Subscriber Equipment	60,649	63.42%	47,723	78.69%	12,926	21.31%
Total	$ 95,635	100.00%	$ 74,909	78.33%	$ 20,726	21.67%

[12] For further clarification and understanding, user communications components and the associated costs include all costs of equipment not categorized as shared infrastructure that has been incurred by the owner agency and can include administration, programming, training, exercises, bi-directional amplifiers used for in-building coverage, gateway equipment, subscriber equipment, DOD Transportable Systems, etc.

[13] Note that many of these cost categories are the same as those under the shared infrastructure section. The difference is that those in Table II.3 supported the shared infrastructure, while those in Table II.4 support only one set of users.

Projected Potential Future Shared Infrastructure Cost

It is anticipated that ALMR users will share in the funding of future management and O&M costs of the ALMR shared infrastructure over the remaining seventeen years of the System lifecycle, July 1, 2008 (FY 2009) through June 30, 2025 (FY 2025). Future costs associated with user subscriber equipment and other communications components are to be borne by each user agency.

Projected, potential, future costs are those costs identified in this TCO that are candidates for the ALMR Cost Share, and are driven by the service levels defined in the SLA. As identified and quantified in this document, the ALMR stakeholders will agree on which of these costs will be shared, and which will be borne by the agency incurring them, and will delineate those costs in the final signed Cost Share Agreement.

Projected, potential, future shared infrastructure costs include annual costs associated with managing, operating, and maintaining the ALMR shared infrastructure. The costs of periodic upgrades to the System hardware and software solution are treated as capital costs and have been identified as one-time costs in the year in which they are projected to be incurred.

Future Operations and Maintenance Costs

Operations and maintenance is the primary cost category for which potential future costs are projected to be incurred in support of the ALMR shared infrastructure. These are the basic O&M costs required to support the services levels defined in the SLA. Annual O&M costs are projected to increase from approximately $5.2 million in FY 2009 to approximately $8.6 million in FY 2025. All O&M services, except for circuit usage associated with use of the State of Alaska Telecommunications System (SATS), are projected to be provided through contracts with private service providers. The majority of circuit usage associated with ALMR will be provided by SOA over SATS[14]. Table III.1 provides a summary of projected, potential, future shared infrastructure O&M costs by cost category, fiscal year, and in total. Costs for FY 2009 have been projected based on third-party contracts and SOA circuit costs. Annual costs for FY 2010 through FY 2025 have been projected by inflating the FY 2009 costs annually by 2.83 percent. The annual inflation rate of 2.83 percent is the average CPI for Anchorage[15] for the past three years for which CPI information is available (2005, 2006, and 2007). The following is a description of the four cost categories comprising ALMR shared infrastructure O&M costs:

- Operations Management Office[16] – Contracted costs of the Operations Management Office (OMO) which is responsible for overseeing the day-to-day operations of the

[14] Not all circuit costs supporting the shared infrastructure are provided by the SOA. DOD has implemented a small percentage of circuit equipment and maintains and provides bandwidth currently at no cost to the user.

[15] Anchorage CPI information was obtained from the Alaska Department of Labor & Workforce Development website. See http://almis.labor.state.ak.us

[16] An Operations Management Office Customer Support Plan has been published and is available from the User Council or the Operations Management Office that describes in detail the services provided to the customer.

ALMR shared infrastructure. Activities include coordinating and performing a range of operational and administrative activities in direct support of delivering 24/7 ALMR services, developing and administering strategic and operating plans, developing and maintaining relationships with program managers of the ALMR stakeholders and with current and prospective ALMR users, providing administrative support, reports, and recommendations to the User Council and Executive Council. The OMO also performs third party quality control of preventative maintenance inspections provided on the System to ensure that it is maintained in accordance with the SLA.

- System Management Office[17] – Contracted costs of the System Management Office (SMO) which is responsible for wide area system management, asset management, help desk, system maintenance and technical support, network operations and support, radio frequency spectrum management support, and security and information assurance.

- Equipment Maintenance[18] – Contracted costs for the maintenance of all ALMR shared infrastructure equipment. Due to the critical nature of the services supported by ALMR, the User Council has requested that ALMR be operated and maintained at the highest level of maintenance defined in the SLA. The highest level of maintenance (Level A) supports a system that is operational at least 99.999 percent of the time.

- Circuit Usage – Costs of circuits (primarily SATS) utilized by ALMR. Based on current usage information provided by the SOA, ALMR shared infrastructure costs for utilization of SATS circuits have been projected at 6.75 percent of the SOA total annual SATS operating and maintenance costs.

[17] A System Management Office Customer Support Plan has been published and is available from the User Council or the Operations Management Office that describes in detail the services provided to the customer.

[18] Equipment maintenance is not a shared cost component among all stakeholders. In accordance with the cost share approach currently being supported, equipment maintenance costs are borne by the equipment owner only. The rationale is that the equipment owner procured only equipment that they required to support independent agency needs, and not on behalf of the cooperative partnership. The agency allows access/use of the equipment for in-kind access use of other stakeholder infrastructure equipment.

Table III.1
Potential Projected Futured ALMR Shared Infrastructure Costs
For State Fiscal Years 2009 Through 2025
Operations and Maintenance Costs
(In thousands)

Fiscal Year	Operations Mgmt. Office	System Mgmt. Office	Equip. Maint.	Circuits	Total
2009	$ 629	$ 1,352	$ 2,898	$ 323	$ 5,202
2010	647	1,391	3,253	332	5,622
2011	665	1,430	3,345	342	5,782
2012	684	1,470	3,440	351	5,945
2013	703	1,512	3,537	361	6,113
2014	723	1,555	3,637	371	6,286
2015	744	1,599	3,740	382	6,464
2016	765	1,644	3,846	393	6,647
2017	786	1,691	3,955	404	6,835
2018	809	1,738	4,067	415	7,029
2019	831	1,788	4,182	427	7,228
2020	855	1,838	4,300	439	7,432
2021	879	1,890	4,422	451	7,643
2022	904	1,944	4,547	464	7,859
2023	930	1,999	4,676	477	8,081
2024	956	2,055	4,808	491	8,310
2025	983	2,113	4,944	505	8,545
Total	$ 13,493	$ 29,008	$ 67,596	$ 6,929	$ 117,026

Future Capital Outlays

Costs of future capital outlays have been projected for periodic upgrades to the System, which may include hardware and software. These capital costs have been identified as one-time costs in the year they are projected to be incurred. Table III.2 provides a summary of projected ALMR future shared infrastructure capital outlay costs for System upgrades by fiscal year, and in total.

- System Software Upgrades – The current version of the System software was acquired during FY 2007. System upgrades are expected to be released and acquired starting in 2012, and approximately every three years thereafter through FY 2024.

Table III.2
Future Projected ALMR Shared Infrastructure Costs
For State Fiscal Years 2009 Through 2025
Capital Costs
(In thousands)

Fiscal Year	System Upgrades	Total
2012	$ 3,500	$ 3,500
2015	3,806	3,806
2018	4,138	4,138
2021	4,499	4,499
2024	4,892	4,892
Total	$ 20,835	$ 20,835

Total Future Costs

Table III.3 provides a summary by year, and in total, of all projected future costs for the System. Total future costs are made up of essential O&M costs as detailed in Table III.1, capital costs as detailed in Table III.2, and two additional cost categories. The first of these cost categories is system-wide training and communications in support of cross-governmental exercises that are usually held every two to three years. These costs may be shared, or may be paid by the agency incurring the costs. The second cost category is the cost of personnel to perform oversight and coordination functions within each stakeholder agency. These costs will not be shared. They will be paid by the agencies incurring them.

Table III.3
Projected Potential Future ALMR Total Costs
For State Fiscal Years 2009 Through 2025
(In thousands)

Fiscal Year	Operations & Maint.	System Upgrades	Oversight & Coord.	Exercise Support & Training	Total
2009	$ 5,202		$ 263	$ -	$ 5,465
2010	5,622		270	343	6,236
2011	5,782		278	-	6,060
2012	5,945	3,500	286	362	10,093
2013	6,113		294	-	6,408
2014	6,286		302	383	6,972
2015	6,464	3,806	311	-	10,581
2016	6,647		320	405	7,372
2017	6,835		329	-	7,164
2018	7,029	4,138	338	428	11,933
2019	7,228		348	-	7,575
2020	7,432		357	453	8,243
2021	7,643	4,499	368	-	12,509
2022	7,859		378	479	8,716
2023	8,081		389	-	8,470
2024	8,310	4,892	400	506	14,108
2025	8,545		411	-	8,956
Total	$ 117,026	$ 20,835	$ 5,642	$ 3,359	$ 146,861

Benchmarking

As part of the TCO process, a questionnaire was developed and transmitted to eight states that either have, or are in the process of implementing, a similar system to ALMR. The eight states selected represented a cross section of operational maturity, comparable technology, and similar geography out of a population of approximately 20 states that have, or are planning to implement, statewide shared systems. The primary focus of the questionnaire was the acquisition of information on other similar systems that would provide a context against which several statistics from the ALMR System can be gauged, rather than a finite set of metrics to evaluate cost reasonableness. The state communications entities from the following five states responded: Colorado, Indiana, Michigan, Pennsylvania, and South Carolina. The information provided varied significantly between the states due to the population size and density variances, the size of the area covered, the number of entities in the state, their topographical characteristics, and the equipment they are responsible for operating and maintaining.

System Configuration

All of the states are using the same, or very similar, interoperable system software and connectivity technology, and all have the goal of achieving the highest level of interoperability on the SAFECOM Continuum[19]. Four of the five responding states are using Motorola ASTRO 25™ trunking system software technology and equipment for their infrastructure (Pennsylvania is using M/A-COM Open Sky™). Indiana and South Carolina are using the same, or earlier, version of the Motorola SmartZone™ technology utilized by ALMR.

Although the responding states are using very similar interoperable system software and connectivity technology, the number of system sites utilized by each state, and the number of subscribers, varies significantly. Table IV.1 provides the number of sites for each state.

Table IV.1
Number of Sites

State	Current	Planned Additional	Total
Alaska	82	8	90*
Colorado	153	37	190
Indiana	134	16	150
Michigan	220	0	220
Pennsylvania	550	300	850
South Carolina	158	0	158

*See footnote[20]

[19]SAFECOM Continuum: See www.safecomprogram.gov. SAFECOM is a communications program of the Department of Homeland Security. SAFECOM provides research, development, testing and evaluation, guidance, tools, and templates on interoperable communications-related issues to local, tribal, state, and Federal emergency response agencies.

[20] Total of 90 sites is based on original System design without AWARN; with the addition of AWARN, the total number is 105 sites.

Table IV.2 provides the number of subscribers for each state. In Alaska, the number of federal government users on ALMR is almost 50 percent. The highest percentage of federal users on any of the other statewide systems is Michigan, where they represent less than 10 percent of the user base.

Table IV.2
Users and Numbers of Subscriber Units

State	Current	Planned Additional*	Total	Users **
Alaska	11,000	4,000	15,000	All
Colorado	27,000	3,000	30,000	All
Indiana	34,000	21,000	55,000	All
Michigan	44,000	26,000	70,000	All
Pennsylvania	15,000	10,000	25,000	State Only
South Carolina	23,000	7,000	30,000	All

* As of November 2007.

** All - Includes local, state, and federal entities.

Entity Responsibilities and Composition

All of the states used in the comparison have designated a single state government entity responsible for the management, operation, and maintenance of their system, and none of them use the consortium approach adopted by ALMR, which incorporates all levels of government. Although all of the state entities have the same general responsibilities, the composition and size of each entity varies significantly. The size of the entities are primarily affected by the number of subscriber units, their maintenance responsibilities, and whether they contract for maintenance or provide it with state staff. Table IV.3 provides the composition of the responding state organizations by major activity.

Table IV.3
Composition of Entity

State	Mgmt. & Admin	Finance & Billing	Help Desk	Operations	Maint.	Total
Alaska	2	0	1	4	2	9
Colorado	2	2	4	6	35	49 *
Indiana	2	3	2	3	0	10
Michigan	2	3	9	6	50	70
Pennsylvania	4	1	13	12	0	30
South Carolina	3	0	0	0	0	3

* See footnote [21]

The quantities represented in Table IV.3 represent various mixes of contracted-versus-state employee operations and maintenance strategies. In Alaska, Indiana, Colorado, Michigan, and Pennsylvania, the central entity is only responsible for maintaining the system's shared infrastructure. South Carolina has completely outsourced all O&M activities and the three positions noted in the chart are for state oversight only. In Colorado and Michigan, maintenance is provided by state employees, which accounts for their large staffing size. As in Alaska, the other states contract for maintenance services.

[21] The 49 personnel identified for the Colorado system operate and maintain both the radio system and the microwave system. A breakout of only the radio system personnel was not provided.

Build-out Cost and Funding

None of the states that responded to the questionnaire had completed a TCO study, or maintained any detailed records on the total cost to complete and implement (build-out) their system. Further, none of the states indicated that their implementation addressed in-building coverage, communications with disparate radios systems, or a transportable solution which the total cost of ALMR includes.[22] As a result, it was not clear whether all costs beyond the physical build-out of fixed sites and procurement of subscriber equipment were included[23]. However, based on non-audited records and non-official records, all the responding states provided build-out cost estimates. The system components included in the cost estimates varied significantly in that some only include infrastructure components, while others include transport backbone costs.

Table IV.4 provides the build-out cost estimate provided by each of the states, and the cost components included in each cost estimate.

[22] ALMR executed a standards based communications technology solution that addressed the need to interoperate in a secure, on-demand and in-real-time basis. The solution examined the; who, when, where, what and how of interoperable communications to meet public safety and homeland security roles and missions. This examination led to engineering and system designs and implementation of fixed sites, critical infrastructure/in-building coverage solutions, an ALMR gateway network for interoperability with disparate radio systems and a transportable solution. ALMR also completely incorporated the SAFECOM five success elements. The incorporation of the SAFECOM elements aside from a standards based technology and single shared systems approach, required execution of training and exercises, deliberative planning and development of plans, development of standard operating tactics, techniques and procedures, development of governance and extensive outreach efforts.

[23] Based on the lack of an even benchmark, the reader should not conduct an exact cost comparison between ALMR total costs and those of the other states presented here.

Table IV.4
Buildout/Implementation Costs

State	Costs	Components
Alaska	$195,173,000	Includes infrastructure, subscriber units, project management, design and engineering. Does not include microwave backbone that was already in place.
Colorado	146,600,000	Includes infrastructure and subscriber units. Does not include the majority of the microwave backbone or about 85 sites that were already in place.
Indiana	80,000,000	Includes the cost of infrastructure and site construction work, excluding towers. No subscriber equipment is included as that is the responsibility of each participating agency.
Michigan	230,000,000	Includes the cost of the infrastructure and approximately 3,000 subscriber units.
Pennsylvania	500,000,000	Includes all state owned infrastructure and subscriber units.
South Carolina	80,000,000	Only includes the cost of the infrastructure equipment.

Only in Alaska has the primary funding source for the statewide system been federal funds. Although Colorado (33.4 percent) and Indiana (14.5 percent) did utilize federal funding, the five responding states primarily funded their systems through general fund appropriations and special levies. The older systems in Michigan, Pennsylvania, and South Carolina were funded entirely through state general fund appropriations. Indiana funded approximately 77 percent of their costs through a special levy created by the Indiana General Assembly. The Assembly dedicated $1.25 of certain fees collected by the State's Bureau of Motor Vehicles to fund costs associated with the construction, operation, and maintenance of the system infrastructure.

Annual Operating and Maintenance Costs

The annual costs to operate and maintain the systems vary significantly. The primary factor affecting costs is the number of system sites. Table IV.5 provides the annual operating and maintenance cost estimate for FY 2009 provided by each of the states.

Table IV.5
FY2009 Annual Operating and Maintenance Costs

State	Costs	Components
Alaska	$5,202,000	Includes operations and maintenance for shared system components.
Colorado	3,900,000	Includes operations and maintenance for state-owned portion of the infrastructure.
Indiana	12,000,000	Includes operations and maintenance for state owned infrastructure.
Michigan	16,000,000	Includes operations and maintenance for state owned infrastructure. Costs are expected to rise to $20 million as equipment begins reaching the end of its life cycle.
Pennsylvania	28,000,000	Includes operations and maintenance for state owned infrastructure.
South Carolina	11,000,000	Includes operations and maintenance of the RF and backbone infrastructure and 24 hour system monitoring. Not included are costs by large users that are credited against their user charges.

Table IV.6 provides the average annual operating and maintenance cost per site. The average cost is calculated by dividing each system's total annual operating and maintenance costs by their current number of sites. Michigan and Pennsylvania costs include subscriber unit maintenance costs, which they were unable to segregate from the total costs. It should also be noted that a base, or minimum, level of administrative and system support costs is required regardless of the number of sites, and will usually not increase proportionately as sites are added.

Table IV.6
Average Annual Operating and Maintenance Costs Per Site

State	Number of Sites	Annual O&M Costs	Average Per site
Alaska	82	$5,202,000	$63,439
Colorado	103*	3,900,000	37,864*
Indiana	134	12,000,000	89,552
Michigan	220	16,000,000	72,727
Pennsylvania	550	28,000,000	50,909
South Carolina	158	11,000,000	69,620

* See footnote [24]

Annual Operating and Maintenance Funding

As discussed before, Alaska is the only state where the System is being operated under a consortium approach. Furthermore, as of this writing, the ALMR stakeholders have not selected a Cost Share approach and method. Only Pennsylvania is funding their annual costs entirely through state general fund appropriations. Three of the five states are funding either all, or a portion, of their annual costs through subscriber and/or usage fees. Indiana is funding their annual costs from a dedicated fee assessed on certain vehicles and boats. The following is a more detailed discussion of how each state funds the annual O&M costs for their statewide system.

- Colorado – The state charges a subscriber fee to state agencies of $265 per year for each subscriber unit. Only state agencies are charged. Federal and local agencies are not assessed any fees or costs for system usage.

- Indiana - The Indiana General Assembly dedicated $1.25 of certain fees collected by the State's Bureau of Motor Vehicles to fund costs associated with the construction, operation, and maintenance of the system's infrastructure. The $1.25 is assessed on

[24] The Colorado system consists of equipment and sites that are both state owned and owned by local government. The $3.9 million number referenced in the table above applies only to the radio equipment and 103 sites that are managed by the State of Colorado. The total cost for operating and maintaining all 153 total sites that make up the Colorado system is borne by both the State of Colorado and local communities and was not available. This information was provided by Kim Coleman of the Colorado Department of Information Technology on September 3, 2008.

transactions such as driver's licenses, and vehicle and boat registrations. Currently the fee generates approximately $13 million in revenue, which is used to fund operations, maintenance, and capital upgrades to the system.

- Michigan – The state funds their annual costs through state general fund appropriations, and federal and local subscriber fees. Basically, the state has established a subscriber fee for any non-state user, and makes up the difference through state general fund appropriations. The state waives a significant amount of local fees to encourage infrastructure integration. User fees range from $0 to $200 per year, based on level of planned system usage.

- Pennsylvania – The state funds their annual costs entirely through state general fund appropriations.

- South Carolina – The state funds all of their annual costs through monthly fees for basic dispatch services and system features, and annual fees for mutual aid and interoperability access. The monthly fees are charged to state and local users, and are based on a detailed feature-based billing process. The base fee for statewide access is $62.50 per month. The annual fees charged to federal agencies are for mutual aid and interoperability access only. Federal agencies must maintain their own separate radio communications systems for daily operations.

This concludes the Executive Summary.

Alaska Land Mobile Radio Communications System
Total Cost of Ownership Study
Historical Costs Section

Alaska Land Mobile Radio Communications System
Total Cost of Ownership Study
Historical Cost and Funding Section

The objective of this section of the TCO is to provide the total cost and funding associated with the management, implementation, and operation and maintenance of the ALMR network enterprise system shared infrastructure (ALMR shared infrastructure) through June 30, 2008. Exhibits in this section provide the historical costs and funding associated with ALMR implementation and operations as defined in the Cost Components Section of this report.

Cost and Funding Exhibits

Exhibits providing and supporting the development of the total costs and funding associated with the management, implementation, and operation and maintenance of the System shared infrastructure are provided on the following pages. Exhibits are also provided with user infrastructure and subscriber equipment costs and funding information. However**,** only cost and funding information associated with shared infrastructure components have been verified by the stakeholders. Significant effort has been expended by the Stakeholders in determining all historical cost and funding information related to shared infrastructure components. Cost and funding information associated with user infrastructure and subscriber equipment costs were not provided by all users and in some cases cost estimates were made based on the number and type of equipment a user had registered on ALMR.

The exhibits provide cost and funding through June 30, 2008 by major cost category and by source of funding. Costs in exhibit columns labeled "Shared Infrastructure" are costs classified as shared infrastructure in the Shared Infrastructure Cost Components Section of the report. Costs in columns labeled "User" are costs classified as user infrastructure and subscriber equipment which do not benefit all ALMR users. Funding for each cost category is identified as either state and local or federal. The source of state and local funding is either from state appropriations, local entity appropriations, or other non-federal funding sources. Federal funding includes direct appropriation to DOD and other federal agencies, and federal grants and awards to the State and local Alaska entities. The following cost categories are included on the exhibits:

- Project Oversight – Costs of and associated with coordinating and holding Executive Council and User Council meetings, and with preparing for and attending the meetings by council members.

- Project Management Support – Costs of and associated with stakeholder project managers, technical support, project office support staff, and other costs incurred while assisting in the development and implementation of ALMR.

- Operations Management and Support – Contracted costs of the Operations Manager and staff, and general operations support costs.

- Studies and Reports – Costs of contracted special studies and reports such as system designs and analysis, critical plans, tactical interoperability planning, and total cost of ownership.

- Statewide Exercise Support – Costs of contracted assistance in the planning, coordination, and support of statewide exercises designed to test ALMR during FY 2003, 2005, 2007, and 2010.

- Site Implementation – Costs of, and associated with, improvements and enhancements made to bring sites into compliance, and all communications equipment and services required to incorporate sites into the System.

- System Software Upgrades – Costs associated with updating the Motorola ASTRO 25™ Digital Trunking WAN SmartZone solutions software from Version 6.2 to 7.1.

- System Management and Maintenance – Contracted costs for the System Manager and staff, and for maintenance of the shared infrastructure.

- Circuit Usage – Costs of circuits, primarily SATS, utilized by ALMR.

- Transportable/Deployable System – Costs associated with two transportable/deployable (T/D) systems that have been procured and are currently being maintained by DOD. Although the T/D systems are potentially available to any user upon request through DOD, the costs of the T/D systems are currently classified as user equipment for this TCO Study.

- Subscriber Equipment - Costs of equipment, warranties, programming, and maintenance of handheld and mobile communication equipment.

The exhibits are provided following a brief description of the purpose and content of each exhibit.

Exhibit II-A: ALMR Historical Cost and Funding Summary - The exhibit provides a summary of ALMR-related costs and funding through June 30, 2008, by major cost category.

Exhibit II-B: ALMR Historical Cost Summary by Stakeholder - The exhibit provides a summary of ALMR-related costs through June 30, 2008, by major cost category for each stakeholder, and in total. The columns under the heading "Grand Total Costs" reconciles back to the columns under the heading "Cost" in Exhibit II-A.

Exhibit II-C: ALMR Historical Funding Summary by Stakeholder - The exhibit provides a summary of ALMR funding through June 30, 2008 by major cost category for each stakeholder, and in total. The columns under the heading "Grand Total Funding" reconciles to the columns under the heading "Funding" on Exhibit II-A.

Exhibit II-D: ALMR Historical Shared Infrastructure Funding by Stakeholder - The exhibit provides a summary of ALMR funding through June 30, 2008, for shared infrastructure by major cost category for each stakeholder and in total. The total column under the heading "Grand Total Funding" reconciles to the column under the heading "Cost – Shared Infrastructure" in Exhibit II-A.

Exhibit II-E: ALMR Historical User Infrastructure and Subscriber Equipment Funding by Stakeholder - The exhibit provides a summary of ALMR funding through June 30, 2008 for user infrastructure and subscriber equipment by major cost category for each stakeholder and in total. The total column under the heading "Grand Total Funding" reconciles to the column under the heading "Cost – User" in Exhibit II-A.

Exhibit II-F: U.S. Department of Defense, ALMR Historical Cost Summary - The exhibit provides a summary of the costs incurred by the U.S. Department of Defense related to ALMR through June 30, 2008, by major cost category. Costs are identified as shared infrastructure, user infrastructure, and user equipment (subscriber equipment). Costs were provided by the DOD ALMR Project Office.

Exhibit II-G: Non-Department of Defense Federal Agencies, ALMR Historical Cost Summary - The exhibit provides a summary of the costs incurred by federal agencies other than the U.S. Department of Defense related to ALMR through June 30, 2008, by major cost category. Costs for the Bureau of Land Management and the Federal Aviation Administration in Fairbanks were provided by the agencies. Costs for nine of the other agencies were estimated based on the number and type of equipment each agency had registered on ALMR, and the current cost of the registered equipment. Costs for three of the other agencies were not included because they have no ALMR registered equipment and did not provide any cost information.

Exhibit II-H: State of Alaska, ALMR Historical Cost and Funding Summary - The exhibit provides a summary of the costs and funding incurred by the State of Alaska related to ALMR through June 30, 2008, by major cost category. Costs are identified as shared infrastructure, user infrastructure and equipment (subscriber equipment), and in total. The following exhibits provide the source of cost information and methods used to estimate costs.

- Exhibit II-H.1: State of Alaska, Oversight and Management Costs - The exhibit provides the source of the information utilized to estimate State ALMR historical costs through June 30, 2008, related to the project oversight and project management cost categories. It was necessary to estimate costs because the State did not maintain detailed records on these costs. Cost estimates were provided by the Deputy Director of the Division of Enterprise Technology Services (ETS) of the Alaska Department of Administration.

- Exhibit II-H.2: State of Alaska, Capital Costs and Funding – The exhibit provides the appropriations applicable to ALMR by Chapter (Ch) and Session Laws of Alaska (SLA) year. The exhibit also provides what each appropriation covered and the source of the funding.

- Exhibit II-H.3: State of Alaska, Enterprise Technology Services Costs – The exhibit provides the costs incurred, or projected to be incurred, by ETS for the State FY 2005 through 2008. The Exhibit also provides the calculation of the amount of SATS circuit cost applicable to ALMR for FY 2005 through 2008 that are included on Exhibit H. The method for determining ALMR circuit costs was to multiply ETS total SATS costs for each year by the ALMR circuit usage percentage by the estimated percentage of ALMR sites that were operational during the fiscal year. ALMR circuit percentage usage of 6.75% was provided by the ETS ALMR Project Manager based on a circuit usage study completed by ETS staff. The percentage of ALMR sites operational for each year was also provided by the ETS ALMR Project Manager.

- Exhibit II-H.4: State of Alaska, ALMR Subscriber Equipment Expenditures – The exhibit provides the cost and funding by state agency for user subscriber equipment. The information was provided by the ETS ALMR Project Manager.

Exhibit II-I: Municipality of Anchorage, ALMR Historical Cost and Funding Summary - The exhibit provides a summary of the costs and funding incurred by the Municipality of Anchorage (MOA) related to ALMR through June 30, 2008, by major cost category. Cost and funding information was provided by the MOA Director of Wireless Communications.

Exhibit II-J: State of Alaska Other Local Entities, User Infrastructure and Subscriber Equipment - The exhibit provides cost and funding information for Alaska local entities other than the MOA related to ALMR through June 30, 2008, by major cost category. Costs and funding information were provided by a few entities. However, cost and funding for most of the entities were estimated based on the number and type of equipment each entity had registered on ALMR and the current cost of the registered equipment. These entities are marked with an asterisk on the exhibit. Entities for which there is no cost or funding information were not included because they have no ALMR registered equipment and did not provide any cost information.

This concludes the narrative of the Historical Cost and Funding Section. Section exhibits are provided on the following pages.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

ALMR HISTORICAL COST AND FUNDING SUMMARY
COSTS AND FUNDING THROUGH JUNE 30, 2008

	COST			FUNDING		
COST CATEGORY	SHARED INFRASTR.	USER	TOTAL	STATE LOCAL	FEDERAL	TOTAL
Project Oversight	$378,000	$46,000	$424,000	$322,000	$56,000	$378,000
Project Management Support	2,399,235	5,058,584	7,457,819	1,541,593	5,962,226	7,503,819
Operations Management & Support	2,271,000	50,000	2,321,000	0	2,321,000	2,321,000
Studies and Reports	3,157,000	1,853,000	5,010,000	0	5,010,000	5,010,000
Statewide Exercise Support	1,811,000	0	1,811,000	0	1,811,000	1,811,000
Site Implementation	71,509,518	16,585,000	88,094,518	38,340,076	49,754,442	88,094,518
System Software Upgrades	5,962,000	1,950,000	7,912,000	0	7,912,000	7,912,000
System Management & Maint.	11,339,000	1,346,959	12,685,959	537,959	12,148,000	12,685,959
Circuit Usage	710,972	50,000	760,972	760,972	0	760,972
Transportable/Deployable System	0	8,046,000	8,046,000	0	8,046,000	8,046,000
Subscriber Equipment	0	60,649,235	60,649,235	12,926,000	47,723,235	60,649,235
Total Costs	$99,537,725	$95,634,778	$195,172,503	$54,428,600	$140,743,903	$195,172,503
Percentage	51.00%	49.00%	100.00%	27.89%	72.11%	100.00%

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

ALMR HISTORICAL COST SUMMARY BY STAKEHOLDER
COSTS THROUGH JUNE 30, 2008

	U.S. DEPARTMENT OF DEFENSE			OTHER FEDERAL AGENCIES			STATE OF ALASKA		
COST CATEGORY	SHARED INFRASTR.	USER	TOTAL	SHARED INFRASTR.	USER	TOTAL	SHARED INFRASTR.	USER	TOTAL
Project Oversight	$56,000	$0	$56,000	$0	$0	$0	$322,000	$0	$322,000
Project Management Support	1,035,000	4,891,000	5,926,000		8,000	8,000	1,364,235	0	1,364,235
Operations Management & Support	2,271,000	50,000	2,321,000			0	0	0	0
Studies and Reports	3,157,000	1,853,000	5,010,000			0	0	0	0
Statewide Exercise Support	1,811,000		1,811,000			0	0	0	0
Site Implementation	22,496,000	291,000	22,787,000			0	49,013,518	2,979,000	51,992,518
System Software Upgrades	5,962,000	1,950,000	7,912,000			0	0	0	0
System Management & Maint.	10,839,000	1,247,000	12,086,000		32,000	32,000	500,000	0	500,000
Circuit Usage			0			0	710,972	0	710,972
Transportable/Deployable System		8,046,000	8,046,000			0	0	0	0
Subscriber Equipment		27,730,000	27,730,000		2,135,500	2,135,500	0	10,626,000	10,626,000
Total Costs	$47,627,000	$46,058,000	$93,685,000	$0	$2,175,500	$2,175,500	$51,910,725	$13,605,000	$65,515,725

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

ALMR HISTORICAL COST SUMMARY BY STAKEHOLDER
COSTS THROUGH JUNE 30, 2008

	MUNICIPALITY OF ANCHORAGE			OTHER ALASKA LOCAL ENTITIES			GRAND TOTAL COSTS		
COST CATEGORY	SHARED INFRASTR.	USER	TOTAL	SHARED INFRASTR.	USER	TOTAL	SHARED INFRASTR.	USER	TOTAL
Project Oversight		46,000	$46,000	$0	$0	$0	$378,000	$46,000	$424,000
Project Management Support		45,000	45,000		114,584	114,584	2,399,235	5,058,584	7,457,819
Operations Management & Support			0			0	2,271,000	50,000	2,321,000
Studies and Reports			0			0	3,157,000	1,853,000	5,010,000
Statewide Exercise Support			0			0	1,811,000	0	1,811,000
Site Implementation	0	12,905,000	12,905,000		410,000	410,000	71,509,518	16,585,000	88,094,518
System Software Upgrades			0			0	5,962,000	1,950,000	7,912,000
System Management & Maint.			0		67,959	67,959	11,339,000	1,346,959	12,685,959
Circuit Usage		50,000	50,000			0	710,972	50,000	760,972
Transportable/Deployable System			0			0	0	8,046,000	8,046,000
Subscriber Equipment		10,000,000	10,000,000		10,157,735	10,157,735	0	60,649,235	60,649,235
Total Costs	$0	$23,046,000	$23,046,000	$0	$10,750,278	$10,750,278	$99,537,725	$95,634,778	$195,172,503

ALMR HISTORICAL FUNDING SUMMARY BY STAKEHOLDER
FUNDING THROUGH JUNE 30, 2008

	U.S. DEPARTMENT OF DEFENSE			OTHER FEDERAL AGENCIES			STATE OF ALASKA		
COST CATEGORY	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL
Project Oversight	$0	$56,000	$56,000	$0	$0	$0	$322,000	$0	$322,000
Project Management Support		5,926,000	5,926,000		8,000	8,000	1,364,235		1,364,235
Operations Management & Support		2,321,000	2,321,000			0			0
Studies and Reports		5,010,000	5,010,000			0			0
Statewide Exercise Support		1,811,000	1,811,000			0			0
Site Implementation		22,787,000	22,787,000			0	33,785,076	18,207,442	51,992,518
System Software Upgrades		7,912,000	7,912,000			0			0
System Management & Maint.		12,086,000	12,086,000		32,000	32,000	500,000		500,000
Circuit Usage			0			0	710,972		710,972
Transportable/Deployable System		8,046,000	8,046,000			0			0
Subscriber Equipment		27,730,000	27,730,000		2,135,500	2,135,500	10,626,000		10,626,000
Total Costs	$0	$93,685,000	$93,685,000	$0	$2,175,500	$2,175,500	$47,308,283	$18,207,442	$65,515,725
Funding Percentage	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	72.21%	27.79%	100.00%

ALMR HISTORICAL FUNDING SUMMARY BY STAKEHOLDER
FUNDING THROUGH JUNE 30, 2008

	MUNICIPALITY OF ANCHORAGE			OTHER ALASKA LOCAL ENTITIES			GRAND TOTAL FUNDING		
COST CATEGORY	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL
Project Oversight	$0	$0	$0	$0	$0	$0	$322,000	$56,000	$378,000
Project Management Support	91,000		91,000	86,358	28,226	114,584	1,541,593	5,962,226	7,503,819
Operations Management & Support			0			0	0	2,321,000	2,321,000
Studies and Reports			0			0	0	5,010,000	5,010,000
Statewide Exercise Support			0			0	0	1,811,000	1,811,000
Site Implementation	4,555,000	8,350,000	12,905,000		410,000	410,000	38,340,076	49,754,442	88,094,518
System Software Upgrades			0			0	0	7,912,000	7,912,000
System Management & Maint.			0	37,959	30,000	67,959	537,959	12,148,000	12,685,959
Circuit Usage	50,000		50,000			0	760,972	0	760,972
Transportable/Deployable System			0			0	0	8,046,000	8,046,000
Subscriber Equipment	2,300,000	7,700,000	10,000,000		10,157,735	10,157,735	12,926,000	47,723,235	60,649,235
Total Costs	$6,996,000	$16,050,000	$23,046,000	$124,317	$10,625,961	$10,750,278	$54,428,600	$140,743,903	$195,172,503
Funding Percentage	30.36%	69.64%	100.00%	1.16%	98.84%	100.00%	27.89%	72.11%	100.00%

ALMR HISTORICALSHARED INFRASTRUCTURE FUNDING BY STAKEHOLDER
FUNDING THROUGH JUNE 30, 2008

	U.S. DEPARTMENT OF DEFENSE			OTHER FEDERAL AGENCIES			STATE OF ALASKA		
COST CATEGORY	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL
Project Oversight	$0	$56,000	$56,000	$0	$0	$0	$322,000	$0	$322,000
Project Management Support		1,035,000	1,035,000			0	1,364,235	0	1,364,235
Operations Management & Support		2,271,000	2,271,000			0			0
Studies and Reports		3,157,000	3,157,000			0			0
Statewide Exercise Support		1,811,000	1,811,000			0			0
Site Implementation		22,496,000	22,496,000			0	30,806,076	18,207,442	49,013,518
System Software Upgrades		5,962,000	5,962,000			0			0
System Management & Maint.		10,839,000	10,839,000			0	500,000		500,000
Circuit Usage			0			0	710,972		710,972
Total Costs	$0	$47,627,000	$47,627,000	$0	$0	$0	$33,703,283	$18,207,442	$51,910,725
Funding Percentage	0.00%	100.00%	100.00%	0.00%	0.00%	0.00%	64.93%	35.07%	100.00%

ALMR HISTORICALSHARED INFRASTRUCTURE FUNDING BY STAKEHOLDER
FUNDING THROUGH JUNE 30, 2008

	MUNICIPALITY OF ANCHORAGE			OTHER ALASKA LOCAL ENTITIES			GRAND TOTAL FUNDING		
COST CATEGORY	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL
Project Oversight	$0	$0	$0	$0	$0	$0	$322,000	$56,000	$378,000
Project Management Support	0		0			0	1,364,235	1,035,000	2,399,235
Operations Management & Support			0			0	0	2,271,000	2,271,000
Studies and Reports			0			0	0	3,157,000	3,157,000
Statewide Exercise Support			0			0	0	1,811,000	1,811,000
Site Implementation	0		0			0	30,806,076	40,703,442	71,509,518
System Software Upgrades			0			0	0	5,962,000	5,962,000
System Management & Maint.			0			0	500,000	10,839,000	11,339,000
Circuit Usage	0		0			0	710,972	0	710,972
Total Costs	$0	$0	$0	$0	$0	$0	$33,703,283	$65,834,442	$99,537,725
Funding Percentage	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.86%	66.14%	100.00%

ALMR HISTORICAL USER INFRASTRUCTURE AND SUBSCRIBER EQUIPMENT FUNDING BY STAKEHOLDER
FUNDING THROUGH JUNE 30, 2008

	U.S. DEPARTMENT OF DEFENSE			OTHER FEDERAL AGENCIES			STATE OF ALASKA		
COST CATEGORY	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL
Project Management Support		$4,891,000	$4,891,000		$8,000	$8,000			$0
Operations Management & Support		50,000	50,000			0			0
Studies and Reports		1,853,000	1,853,000			0			0
Site Implementation		291,000	291,000			0	2,979,000		2,979,000
System Software Upgrades		1,950,000	1,950,000			0			0
System Management & Maint.		1,247,000	1,247,000		32,000	32,000			0
Transportable/Deployable System		8,046,000	8,046,000			0			0
Circuit Costs									
Subscriber Equipment		27,730,000	27,730,000		2,135,500	2,135,500	10,626,000		10,626,000
Total Costs	$0	$46,058,000	$46,058,000	$0	$2,175,500	$2,175,500	$13,605,000	$0	$13,605,000
Funding Percentage	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	100.00%	0.00%	100.00%

ALMR HISTORICAL USER INFRASTRUCTURE AND SUBSCRIBER EQUIPMENT FUNDING BY STAKEHOLDER
FUNDING THROUGH JUNE 30, 2008

	MUNICIPALITY OF ANCHORAGE			OTHER ALASKA LOCAL ENTITIES			GRAND TOTAL FUNDING		
COST CATEGORY	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL	STATE LOCAL	FEDERAL	TOTAL
Project Management Support	91,000		$91,000	$86,358	$28,226	$114,584	$177,358	$4,927,226	$5,104,584
Operations Management & Support			0			0	0	50,000	50,000
Studies and Reports			0			0	0	1,853,000	1,853,000
Site Implementation	4,555,000	8,350,000	12,905,000		410,000	410,000	7,534,000	9,051,000	16,585,000
System Software Upgrades			0			0	0	1,950,000	1,950,000
System Management & Maint.			0	37,959	30,000	67,959	37,959	1,309,000	1,346,959
Transportable/Deployable System			0			0	0	8,046,000	8,046,000
Circuit Costs	50,000		50,000				50,000	0	50,000
Subscriber Equipment	2,300,000	7,700,000	10,000,000		10,157,735	10,157,735	12,926,000	47,723,235	60,649,235
Total Costs	$6,996,000	$16,050,000	$23,046,000	$124,317	$10,625,961	$10,750,278	$20,725,317	$74,909,461	$95,634,778
Funding Percentage	30.36%	69.64%	100.00%	1.16%	98.84%	100.00%	21.67%	78.33%	100.00%

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

U.S. DEPARTMENT OF DEFENSE
ALMR HISTORICAL COST SUMMARY
COSTS THROUGH JUNE 30, 2008

COST CATEGORY	INFRASTRUCTURE COSTS SHARED	INFRASTRUCTURE COSTS USER	INFRASTRUCTURE COSTS TOTAL	USER EQUIPMENT	TOTAL COST
Project Oversight					
DOD Executive Council (ALCOM J6 for 4 years @ $10,000 per year)	$40,000	$0	$40,000	$0	$40,000
DOD User Council Support all entities (45 hours @ $30/hr)	16,000		16,000		16,000
Subtotal	56,000	0	56,000	0	56,000
Project Management Support					
DOD Project Manager (4 years @ $70,000 per year)	280,000		280,000		280,000
Project Office Support (30% of FY 2007-08 Hours)	493,000		493,000		493,000
Project Office Support (70% of FY 2007-08 Hours)		1,150,000	1,150,000		1,150,000
Project Office Support (FY 2006-07 Ince/Marshall)	262,000		262,000		262,000
Project Office Support (FY 2006-07)		621,000	621,000		621,000
Army Support (4 years @ $260,000 per year)		1,040,000	1,040,000		1,040,000
Eielson Support (4 years @ $260,000 per year)		1,040,000	1,040,000		1,040,000
Elmendorf Support (4 years @ $260,000 per years)		1,040,000	1,040,000		1,040,000
Subtotal	1,035,000	4,891,000	5,926,000	0	5,926,000
Operations Management and Support					
ISS Project Management Office Staffing - FY 2004	767,000		767,000		767,000
Operations Management Contract - FY 2007	604,000		604,000		604,000
Operations Management Contract - FY 2008	609,000		609,000		609,000
ISS ALMR Training Plan	128,000		128,000		128,000
OM and Document Specialist	163,000		163,000		163,000
Project Server and Associated Software		50,000	50,000		50,000
Subtotal	2,271,000	50,000	2,321,000	0	2,321,000
Studies and Reports					
Initial TCO Report	600,000		600,000		600,000
Second TCO Report	275,000		275,000		275,000
Share Fund Issues Study	107,000		107,000		107,000
SPAWAR Tactical Interoperability Planning	700,000		700,000		700,000
Motorola Phase I DITSCAP		340,000	340,000		340,000
DITSCAP II		400,000	400,000		400,000
Initial SD/SA (2001)	380,000		380,000		380,000
ISS Critical Program Plans for DOD		673,000	673,000		673,000
SD/SAs	691,000		691,000		691,000
BDA SD/SA		440,000	440,000		440,000
Motobridge SD/SA	404,000		404,000		404,000
Subtotal	3,157,000	1,853,000	5,010,000	0	5,010,000
Statewide Exercise Support					
Northern Edge / Arctic Shield Support - FY 2003	560,000		560,000		560,000
Northern Edge / Arctic Shield Support - FY 2005	475,000		475,000		475,000
Northern Edge / Arctic Shield Support - FY 2007	452,000		452,000		452,000
Northern Edge / Arctic Shield Support - FY 2009	324,000		324,000		324,000
Subtotal	1,811,000	0	1,811,000	0	1,811,000
Site Implementation					
Air Force	1,588,000		1,588,000		$1,588,000
Army	10,525,000		10,525,000		10,525,000
Phase I Sites	2,542,000		2,542,000		2,542,000
Setting Up Alternate Site - Birch Hill Infrastructure	2,419,000		2,419,000		2,419,000
R1 North and Connectivity	1,926,000		1,926,000		1,926,000

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

U.S. DEPARTMENT OF DEFENSE
ALMR HISTORICAL COST SUMMARY
COSTS THROUGH JUNE 30, 2008

COST CATEGORY	INFRASTRUCTURE COSTS SHARED	INFRASTRUCTURE COSTS USER	INFRASTRUCTURE COSTS TOTAL	USER EQUIPMENT	TOTAL COST
BDA for Whittier Tunnel and Ted Stevens Airport	974,000		974,000		974,000
Micro Wave for Willow, Summit, Railroad, Tudor	870,000		870,000		870,000
R1 North and Shelter	786,000		786,000		786,000
Airlift Support for Hope, Silvertip, Divide, Ernistine	390,000		390,000		390,000
Pole Hill/Hill 3265 Relocation		291,000	291,000		291,000
Relocate Sites - Delta, Donnely, Greely Relocation	257,000		257,000		257,000
Site Prep for State of Alaska Sites	219,000		219,000		219,000
Subtotal	22,496,000	291,000	22,787,000	0	22,787,000
System Software Upgrades					
SDA 6.4/6.5 Refresh	1,091,000		1,091,000		1,091,000
System Upgrade to 7.X	4,871,000	1,950,000	6,821,000		6,821,000
Subtotal	5,962,000	1,950,000	7,912,000	0	7,912,000
System Management and Maintenance					
ISS Maintenance Services - FY 2004	1,522,000		1,522,000		1,522,000
Motorola Operations Support - FY 2005	468,000		468,000		468,000
IA Training Product		35,000	35,000		35,000
Wrap-Around Equipment Warranty - FY 2006	2,767,000		2,767,000		2,767,000
Infrastructure Training Classes	422,000		422,000		422,000
System Maintenance - FY 2007	2,536,000		2,536,000		2,536,000
System Maintenance - FY 2008	3,124,000		3,124,000		3,124,000
Subscriber Maintenance FY 2006		388,000	388,000		388,000
Subscriber Maintenance FY 2007		412,000	412,000		412,000
Subscriber Maintenance FY 2008		412,000	412,000		412,000
Subtotal	10,839,000	1,247,000	12,086,000	0	12,086,000
Transportable/Deployable System					
Transortable SD/SA		76,000	76,000		76,000
Transportables and Upgrades		6,711,000	6,711,000		6,711,000
TUGS for Transportable		135,000	135,000		135,000
Operation and Maintenance FY 2007		424,000	424,000		424,000
Operation and Maintenance FY 2008		415,000	415,000		415,000
Sipernet SD/SA		35,000	35,000		35,000
Training DVD		250,000	250,000		250,000
Subtotal	0	8,046,000	8,046,000	0	8,046,000
Subscriber Equipment					
Army Subscriber			0	5,817,000	5,817,000
Eielson Subscriber			0	4,629,000	4,629,000
Eielson Non-Subscriber Installation			0	3,627,000	3,627,000
Elmendorf Subscriber			0	6,031,000	6,031,000
Elmendorf Non-Subscriber Installation			0	1,233,000	1,233,000
AKANG Equipment			0	1,879,000	1,879,000
JTFAK Equipment			0	955,000	955,000
Motorola Subscriber Equipment Upgrades			0	1,847,000	1,847,000
BDA Installation			0	1,410,000	1,410,000
EFJ Subscriber EquipmentUpgrades			0	302,000	302,000
Subtotal	0	0	0	27,730,000	27,730,000
Total Department of Defense	$47,627,000	$18,328,000	$65,955,000	$27,730,000	$93,685,000

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

NON-DEPARTMENT OF DEFENSE FEDERAL AGENCIES
ALMR HISTORICAL COST SUMMARY
COSTS THROUGH JUNE 30, 2008

AGENCY	PROJECT MGMT SUPPORT	SYSTEM MAINT.	SUBSCRIBER EQUIP.	TOTAL COST
Alcohol, Tobacco and Firearms *	$0	$0	$99,900	$99,900
Bureau of Land Management	3,000	26,000	310,000	339,000
Drug Enforcement Administration *			252,300	252,300
Federal Aviation Administration - Fairbanks	5,000	6,000	300,000	311,000
Federal Bureau of Investigations *			256,500	256,500
Federal Emergency Management Agency *			4,500	4,500
Internal Revenue Service *			87,000	87,000
NOAA - Fisheries Enforcement *			297,300	297,300
Transportation Safety Agency *			132,000	132,000
US Fish and Wildlife Service *			158,100	158,100
US Marshall's Service *			237,900	237,900
Total	$8,000	$32,000	$2,135,500	$2,175,500

* Costs estimated based on number and type of equipment on ALMR system.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

STATE OF ALASKA
ALMR HISTORICAL COST AND FUNDING SUMMARY
COSTS AND FUNDING THROUGH JUNE 30, 2008

	SHARED INFRASTRUCTURE				USER INFRASTRUCTURE & EQUIPMENT				TOTAL			
		FUNDING				FUNDING				FUNDING		
COST CATEGORY	COSTS	STATE	FEDERAL	TOTAL	COSTS	STATE	FEDERAL	TOTAL	COSTS	STATE	FEDERAL	TOTAL
Project Oversight												
Executive Council	$168,000	$168,000	$0	$168,000	$0	$0	$0	$0	$168,000	$168,000	$0	$168,000
User Council	154,000	154,000		154,000				0	154,000	154,000	0	154,000
Subtotal	322,000	322,000	0	322,000	0	0	0	0	322,000	322,000	0	322,000
Project Management Support												
Dept. of Administration - ETS	638,035	638,035		638,035				0	638,035	638,035	0	638,035
Dept. of Military/Veterans Affairs	726,200	726,200		726,200				0	726,200	726,200	0	726,200
Subtotal	1,364,235	1,364,235	0	1,364,235	0	0	0	0	1,364,235	1,364,235	0	1,364,235
Site Implementation												
Capital Appropriations	47,672,442	29,465,000	18,207,442	47,672,442	2,979,000	2,979,000		2,979,000	50,651,442	32,444,000	18,207,442	50,651,442
Operations SFY 2008	1,341,076	1,341,076		1,341,076				0	1,341,076	1,341,076	0	1,341,076
Subtotal	49,013,518	30,806,076	18,207,442	49,013,518	2,979,000	2,979,000	0	2,979,000	51,992,518	33,785,076	18,207,442	51,992,518
System Maintenance	500,000	500,000		500,000				0	500,000	500,000	0	500,000
SATS Circuit Usage												
SFY 2005	150,440	150,440		150,440				0	150,440	150,440	0	150,440
SFY 2006	105,108	105,108		105,108				0	105,108	105,108	0	105,108
SFY 2007	189,179	189,179		189,179				0	189,179	189,179	0	189,179
SFY 2008	266,245	266,245		266,245				0	266,245	266,245	0	266,245
Subtotal	710,972	710,972	0	710,972	0	0	0	0	710,972	710,972	0	710,972
Subscriber Equipment												
Dept. of Administration - ETS				0	347,000	347,000		347,000	347,000	347,000	0	347,000
Dept. of Corrections				0	364,000	364,000		364,000	364,000	364,000	0	364,000
Dept. of Environ. Conservation				0	386,000	386,000		386,000	386,000	386,000	0	386,000
Dept. of Natural Resources				0	292,000	292,000		292,000	292,000	292,000	0	292,000
Dept. of Public Safety				0	3,716,500	3,716,500		3,716,500	3,716,500	3,716,500	0	3,716,500
Dept. of Transportation				0	5,520,500	5,520,500		5,520,500	5,520,500	5,520,500	0	5,520,500
Subtotal	0	0	0	0	10,626,000	10,626,000	0	10,626,000	10,626,000	10,626,000	0	10,626,000
Total	$51,910,725	$33,703,283	$18,207,442	$51,910,725	$13,605,000	$13,605,000	$0	$13,605,000	$65,515,725	$47,308,283	$18,207,442	$65,515,725

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

STATE OF ALASKA
OVERSIGHT AND MANAGEMENT COSTS
COSTS THROUGH JUNE 30, 2008

DESCRIPTION	ALMR EXECUTIVE COUNCIL	ALMR USER'S COUNCIL	DOA - ETS PROJECT MGMT	DMVA PROJCET MGMT	TOTAL
FY 2005					
Executive Council	42,000				42,000
User Council		38,500			38,500
Project Management - DMVA				363,100	363,100
Project Management - ETS			3,340		3,340
	42,000	38,500	3,340	363,100	446,940
FY 2006					
Executive Council	42,000				42,000
User Council		38,500			38,500
Project Management - DMVA				363,100	363,100
Project Management - ETS			2,095		2,095
	42,000	38,500	2,095	363,100	445,695
FY 2007					
Executive Council	42,000				42,000
User Council		38,500			38,500
Project Management - DMVA					0
Project Management - ETS			363,700		363,700
	42,000	38,500	363,700	0	444,200
FY 2008					
Executive Council	42,000				42,000
User Council		38,500			38,500
Project Management - DMVA					0
Project Management - ETS			268,900		268,900
	42,000	38,500	268,900	0	349,400
Grand Total	$168,000	$154,000	$638,035	$726,200	$1,686,235

STATE OF ALASKA
CAPITAL COSTS AND FUNDING THROUGH JUNE 30, 2008

DESCRIPTION	SITE IMPLEMENTATION			USER INFRASTRUCTURE			GRAND TOTAL		
	STATE	FEDERAL	TOTAL	STATE	FEDERAL	TOTAL	STATE	FEDERAL	TOTAL
Department of Administration									
Ch. 100, SLA 1997									
Anchorage/MAT-SU Emergency	$485,000	$0	$485,000	$0	$0	$0	$485,000	$0	$485,000
Ch.135, SLA 2000									
Site Implementation	850,000		850,000			0	850,000	0	850,000
Ch. 61, SLA 2001									
SATS/ALMR Build Out & Support		2,436,140	2,436,140			0	0	2,436,140	2,436,140
Site Implementation	120,000		120,000			0	120,000	0	120,000
Site Implementation	1,033,000		1,033,000			0	1,033,000	0	1,033,000
Subtotal	1,153,000	2,436,140	3,589,140	0	0	0	1,153,000	2,436,140	3,589,140
Ch. 82, SLA 2003									
Site Implementation	400,000		400,000			0	400,000	0	400,000
Ch. 159, SLA 2004									
Site Implementation	50,000		50,000			0	50,000	0	50,000
Site Implementation	361,000		361,000			0	361,000	0	361,000
Subtotal	411,000	0	411,000	0	0	0	411,000	0	411,000
Ch. 3, FSSLA 2005									
Infrastructure Equipment	3,920,000		3,920,000			0	3,920,000	0	3,920,000
Equipment Installation	1,960,000		1,960,000			0	1,960,000	0	1,960,000
Training			0	25,000		25,000	25,000	0	25,000
Transition Costs	125,000		125,000			0	125,000	0	125,000
Radios Initial Programming			0	25,000		25,000	25,000	0	25,000
System Management	350,000		350,000			0	350,000	0	350,000
Subtotal	6,355,000	0	6,355,000	50,000	0	50,000	6,405,000	0	6,405,000
Ch. 6, SLA 2005									
Infrastructure Equipment	2,754,000		2,754,000			0	2,754,000	0	2,754,000
Equipment Installation	1,374,000		1,374,000			0	1,374,000	0	1,374,000
Trooper's Dispatch Consoles			0	1,020,000		1,020,000	1,020,000	0	1,020,000
Training			0	78,000		78,000	78,000	0	78,000
Upgrade Digital Access System	156,000		156,000			0	156,000	0	156,000
Transition Costs	288,000		288,000			0	288,000	0	288,000
Radios Initial Programming			0	174,000		174,000	174,000	0	174,000
System Management	156,000		156,000			0	156,000	0	156,000
Subtotal	4,728,000	0	4,728,000	1,272,000	0	1,272,000	6,000,000	0	6,000,000

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

STATE OF ALASKA
CAPITAL COSTS AND FUNDING THROUGH JUNE 30, 2008

DESCRIPTION	SITE IMPLEMENTATION			USER INFRASTRUCTURE			GRAND TOTAL		
	STATE	FEDERAL	TOTAL	STATE	FEDERAL	TOTAL	STATE	FEDERAL	TOTAL
Ch. 4, FSSLA 2005									
Site Implementation	920,000		920,000			0	920,000	0	920,000
Ch. 82, SLA 2006									
Equip. (27 sites @ $265K per)	4,655,000		4,655,000			0	4,655,000	0	4,655,000
Frequency Coordination	225,000		225,000			0	225,000	0	225,000
Power Generation	240,000		240,000			0	240,000	0	240,000
SATS/ALMR Build Out	650,000		650,000			0	650,000	0	650,000
Southeast Connectivity	350,000		350,000			0	350,000	0	350,000
SATS/ALMR Build Out	800,000		800,000			0	800,000	0	800,000
SATS/ALMR Build Out		2,500,000	2,500,000			0	0	2,500,000	2,500,000
Subtotal	6,920,000	2,500,000	9,420,000	0	0	0	6,920,000	2,500,000	9,420,000
Ch. 30, SLA 2007									
Motobridge Sites	1,838,000		1,838,000			0	1,838,000	0	1,838,000
Power Solutions	3,220,000		3,220,000			0	3,220,000	0	3,220,000
SATS/ALMR Build Out	1,200,000		1,200,000			0	1,200,000	0	1,200,000
SATS/ALMR Build Out	985,000		985,000			0	985,000	0	985,000
Fairbanks Airport			0	571,000		571,000	571,000	0	571,000
DOC Transition			0	1,086,000		1,086,000	1,086,000	0	1,086,000
Subtotal	7,243,000	0	7,243,000	1,657,000	0	1,657,000	8,900,000	0	8,900,000
Total DOA	29,465,000	4,936,140	34,401,140	2,979,000	0	2,979,000	32,444,000	4,936,140	37,380,140
Department of Military & Veterans Affairs									
Ch. 61, SLA 2001									
Site Implementation		8,927,302	8,927,302			0	0	8,927,302	8,927,302
Ch. 3, FSSLA 2005									
Site Implementation		2,744,000	2,744,000			0	0	2,744,000	2,744,000
2005 RSA									
Site Implementation		1,600,000	1,600,000			0	0	1,600,000	1,600,000
Total DMVA	0	13,271,302	13,271,302	0	0	0	0	13,271,302	13,271,302
Grand Total	$29,465,000	$18,207,442	$47,672,442	$2,979,000	$0	$2,979,000	$32,444,000	$18,207,442	$50,651,442

STATE OF ALASKA
ENTERPRISE TECHNOLOGY SERVICES COSTS
STATE FISCAL YEARS 2005 THROUGH 2008

DESCRIPTION	ACCOUNT CODE	STATE FISCAL YEAR 2005 SATS	ALMR	2-WAY	TV	TOTAL	STATE FISCAL YEAR 2006 SATS	ALMR	2-WAY	TV	TOTAL
Total Costs											
Operating and Maintenance											
Personal Services	71000	$212,346	$0	$780,425	$0	$992,771	$879,626	$0	$825,966	$0	$1,705,592
Travel	72000	76,682	1,210	18,869		96,761	13,660	2,076	16,882		32,618
Services	73000										
ALMR System Maint.						0					0
ALMR Infrastructure						0					0
Other Services		1,919,892	(3,518)	154,256	7,332	2,077,962	175,537	19	90,665	8,888	275,109
Supplies	74000	384,928	5,648	109,174		499,750	326,429		153	380	326,962
Capital Outlays	75000	97,867		6,870		104,737	15,215		15,215		30,430
Subtotal		2,691,715	3,340	1,069,594	7,332	3,771,981	1,410,467	2,095	948,881	9,268	2,370,711
ETS Overhead		1,022,852	0	0	0	1,022,852	535,977	0	0	0	535,977
Total Costs		$3,714,567	$3,340	$1,069,594	$7,332	$4,794,833	$1,946,444	$2,095	$948,881	$9,268	$2,906,688
ALMR Costs For Usage											
ALMR Percentage of Usage *		6.75%					6.75%				
ALMR Costs		$250,733					$131,385				
Percentage of ALMR Operational **		60.00%					80.00%				
ALMR Annual Costs		$150,440					$105,108				

* ALMR usage percent determined from a circuit usage study completed by Enterprise Technology Services staff.

** ALMR operational percentage determined based on the number of ALMR sites that were operational during each year.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

STATE OF ALASKA
ENTERPRISE TECHNOLOGY SERVICES COSTS
STATE FISCAL YEARS 2005 THROUGH 2008

DESCRIPTION	ACCOUNT CODE	STATE FISCAL YEAR 2007 SATS	ALMR	2-WAY	TV	TOTAL	STATE FISCAL YEAR 2008 SATS	ALMR - MGT	ALMR - INFR	2-WAY	TV	TOTAL
Total Costs												
Operating and Maintenance												
Personal Services	71000	$1,234,799	$248,753	$896,639	$0	$2,380,191	$1,777,880	$207,842	$0	$710,648	$0	$2,696,370
Travel	72000	20,271	10,299	31,036		61,606	34,218	15,230		24,909		74,357
Services	73000											
ALMR System Maint.						0			500,000			500,000
ALMR Infrastructure						0			1,341,076			1,341,076
Other Services		519,373	309	168,948	10,983	699,613	821,526			165,943	12,183	999,652
Supplies	74000	357,569	2,760	219,686		580,015	307,490			44,148		351,638
Capital Outlays	75000	11,053	1,008	53,126		65,187	3,263					3,263
Subtotal		2,143,065	263,129	1,369,435	10,983	3,786,612	2,944,377	223,072	1,841,076	945,648	12,183	5,966,356
ETS Overhead		807,091	0	0	0	807,091	1,000,000	0	0	0	0	1,000,000
Total Costs		$2,950,156	$263,129	$1,369,435	$10,983	$4,593,703	$3,944,377	$223,072	$1,841,076	$945,648	$12,183	$6,966,356
ALMR Costs For Usage												
ALMR Percentage of Usage *		6.75%					6.75%					
ALMR Costs		$199,136					$266,245					
Percentage of ALMR Operational **		95.00%					100.00%					
ALMR Annual Costs		$189,179					$266,245					

* ALMR usage percent determined from a circui

** ALMR operational percentage determined ba

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

STATE OF ALASKA
ALMR SUBSCRIBER EQUIPMENT EXPENDITURES
COSTS THROUGH JUNE 30, 2008

	COSTS			FUNDING		
STATE AGENCY	MODEL XTL5000	MODEL XTS5000	TOTAL	STATE	FEDERAL	TOTAL
Dept. of Administration - ETS	$22,000	$325,000	$347,000	$347,000	$0	$347,000
Dept. of Corrections	44,000	320,000	364,000	364,000		364,000
Dept. of Environmental Conservation	71,000	315,000	386,000	386,000		386,000
Dept. of Natural Resources	242,000	50,000	292,000	292,000		292,000
Dept. of Public Safety	2,051,500	1,665,000	3,716,500	3,716,500		3,716,500
Dept. of Transportation	4,405,500	1,115,000	5,520,500	5,520,500		5,520,500
Total Purchases	$6,836,000	$3,790,000	$10,626,000	$10,626,000	$0	$10,626,000

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

MUNICIPALITY OF ANCHORAGE
ALMR HISTORICAL COST AND FUNDING SUMMARY
COSTS AND FUNDING THROUGH JUNE 30, 2008

	SHARED INFRASTRUCTURE				USER INFRASTRUCTURE & EQUIPMENT				TOTAL			
		FUNDING				FUNDING				FUNDING		
DESCRIPTION	COSTS	LOCAL	FEDERAL	TOTAL	COSTS	LOCAL	FEDERAL	TOTAL	COSTS	LOCAL	FEDERAL	TOTAL
Project Oversight												
Executive Council	$0	$0	$0	$0	$45,000	$45,000	$0	$45,000	$45,000	$45,000	$0	$45,000
User Council	0	0		0	1,000	$1,000		1,000	1,000	1,000	0	1,000
Subtotal	0	0	0	0	46,000	46,000	0	46,000	46,000	46,000	0	46,000
Project Management Support												
Joint Project Management Team				0	25,000	25,000		25,000	25,000	25,000	0	25,000
Project Management				0	2,500	2,500		2,500	2,500	2,500	0	2,500
Technical Assistance				0	3,000	3,000		3,000	3,000	3,000	0	3,000
Wide Area System Management				0	2,500	2,500		2,500	2,500	2,500	0	2,500
Technical Support				0	1,000	1,000		1,000	1,000	1,000	0	1,000
RF Spectrum Management				0	3,500	3,500		3,500	3,500	3,500	0	3,500
RF Support				0	1,000	1,000		1,000	1,000	1,000	0	1,000
Training				0	2,500	2,500		2,500	2,500	2,500	0	2,500
Statewide Exercise				0	4,000	4,000		4,000	4,000	4,000	0	4,000
Subtotal	0	0	0	0	45,000	45,000	0	45,000	45,000	45,000	0	45,000
Site Implementation												
Initial Version of Software				0	200,000	200,000		200,000	200,000	200,000	0	200,000
Master Site Implementation				0	1,000,000	1,000,000		1,000,000	1,000,000	1,000,000	0	1,000,000
RF Site Equipment				0	9,000,000	650,000	8,350,000	9,000,000	9,000,000	650,000	8,350,000	9,000,000
Zone Controller Connected NMT				0	30,000	30,000		30,000	30,000	30,000	0	30,000
User NMTs				0	30,000	30,000		30,000	30,000	30,000	0	30,000
Telephone interconnect				0	125,000	125,000		125,000	125,000	125,000	0	125,000
Station 12 site				0	300,000	300,000		300,000	300,000	300,000	0	300,000
Console System				0	90,000	90,000		90,000	90,000	90,000	0	90,000
Other sities				0	2,130,000	2,130,000		2,130,000	2,130,000	2,130,000	0	2,130,000
Subtotal	0	0	0	0	12,905,000	4,555,000	8,350,000	12,905,000	12,905,000	4,555,000	8,350,000	12,905,000
Circuit Usage				0	50,000	50,000		50,000	50,000	50,000	0	50,000
Subscriber Equipment				0	10,000,000	2,300,000	7,700,000	10,000,000	10,000,000	2,300,000	7,700,000	10,000,000
Total	$0	$0	$0	$0	$23,046,000	$6,996,000	$16,050,000	$23,046,000	$23,046,000	$6,996,000	$16,050,000	$23,046,000

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

STATE OF ALASKA LOCAL ENTITIES
USER INFRASTRUCTURE AND EQUIPMENT
ALMR HISTORICAL COST AND FUNDING SUMMARY
COSTS AND FUNDING THROUGH JUNE 30, 2008

	COSTS						FUNDING		
AGENCY	PROJECT OVERSIGHT	MGMT. SUPPORT	SITE IMPLEMENT	SYSTEM MAINT.	SUBSCRIBER EQUIP.	TOTAL	LOCAL	FEDERAL	TOTAL
Denali *					$340,900	$340,900		$340,900	$340,900
Fairbanks Fire Department		43,226			1,677,092	1,720,318	16,000	1,704,318	1,720,318
Fairbanks North Star Borough *					4,387,200	4,387,200		4,387,200	4,387,200
Homer Police Department		50,000	410,000	65,500	365,000	890,500	85,500	805,000	890,500
Juneau *					10,000	10,000		10,000	10,000
Kenai Peninsula *					642,700	642,700		642,700	642,700
Mat-Su Emergency Services *					325,500	325,500		325,500	325,500
McKinley Volunteer Fire Department					55,000	55,000		55,000	55,000
Palmer Police Department *					320,300	320,300		320,300	320,300
Rural Deltana Volunteer Fire Department		17,983		2,459	832,000	852,442	20,442	832,000	852,442
Soldotna Police Department		1,500			228,000	229,500	500	229,000	229,500
Tok Area Emergency Medical Services *					117,600	117,600		117,600	117,600
Valdez Fire Department		1,875			430,343	432,218	1,875	430,343	432,218
Wasilla Police Department *					426,100	426,100		426,100	426,100
Total	$0	$114,584	$410,000	$67,959	$10,157,735	$10,750,278	$124,317	$10,625,961	$10,750,278

* Costs estimated based on number and type of equipment on ALMR system.

Alaska Land Mobile Radio Communications System
Total Cost of Ownership Study
Projected Future Cost Section

Alaska Land Mobile Radio Communications System
Total Cost of Ownership Study
Projected Future Cost Section

The objective of this section of the TCO is to provide the projected future costs associated with managing, operating, and maintaining the ALMR shared infrastructure through June 30, 2025, the anticipated end of the ALMR shared infrastructure lifecycle. It is anticipated that ALMR users will share in the funding of future management and O&M costs of the ALMR shared infrastructure over the remaining seventeen years of System's lifecycle. However, neither the scope nor objective of the TCO includes the determination of the amount of costs to be shared or funded by each stakeholder, or the method for determining each stakeholder's share of future ALMR shared infrastructure costs. Future costs associated with user subscriber infrastructure, radios, and other communication equipment are to be borne by each user.

Exhibits in this section provide the projected future costs and funding necessary to operate and maintain the ALMR shared infrastructure components as defined in the Cost Components Section of this study. Projected future costs include, but are not limited to, annual costs associated with managing, operating, and maintaining the ALMR shared infrastructure. They also include the costs of periodic upgrades to the System software solution. These capital costs have been identified as one-time costs in the year they are projected to be incurred. Costs of depreciation or an allowance for the replacement of equipment and other capital costs, have not been included. Federal funding policies require the funding of the replacement or updating of equipment from capital appropriations, and not from annual operating and maintenance funds.

Future Cost Exhibits

Exhibits providing and supporting the development of the projected future costs associated with the management, implementation, and operation and maintenance of the ALMR shared infrastructure are provided on the following pages. The exhibits provide ALMR projected future costs for the period July 1, 2008 (FY 2009) through June 30, 2025 (FY 2025), the anticipated lifecycle of the ALMR shared infrastructure. Costs are provided by major cost category, by fiscal year, and in total. The following cost categories are included on the exhibits:

- Operations Management Office – The contracted costs of the Operations Management Office (OMO), which is responsible for overseeing the day-to-day operations of the ALMR shared infrastructure, include coordinating and performing a range of operational and administrative activities in direct support of delivering 24/7 ALMR services; developing and administering strategic and operating plans; developing and maintaining relationships with program managers of the ALMR stakeholders, and with current and prospective ALMR users; providing administrative support, reports, and

recommendations to the ALMR User Council and ALMR Executive Council; and the cost associated with an annual audit.

- System Management Office – The contracted costs of the System Management Office (SMO) include wide area system management, system maintenance and technical support, network operations and support, radio frequency spectrum management support, and security and information assurance.

- Equipment Maintenance – Contracted costs for the maintenance of all ALMR shared infrastructure equipment. For the TCO, the projected future costs of all operations and maintenance services associated with the ALMR shared infrastructure have been developed at a level that supports a system that is operational at least 99.999% of the time.

- Circuit Usage – Costs of circuits, primarily SATS, utilized by ALMR. Based on current usage information provided by the SOA ETS, ALMR shared infrastructure costs for utilization of SATS circuits have been projected at 6.75% of the SOA total annual SATS operating and maintenance costs.

- Statewide Exercise Support – Costs of contracted assistance in the planning, coordination, and support of statewide exercises where ALMR provides communications support. Costs of participating in ALMR statewide exercises by stakeholder staff have not been projected, and are not included in any cost category for this TCO. It is anticipated that stakeholder participation costs associated with staff and related supplies and services would be borne by each stakeholder.

- System Upgrades – System upgrades are expected to be released and acquired approximately every three years through 2022. Therefore, costs for the purchase of system upgrades have been projects for every three years: starting in 2012 and ending in 2024.

- Executive Council – Costs of supporting, attending, coordinating, and holding Executive Council meetings, and with preparing for and attending the meetings by council members.

- User Council – Costs of supporting, attending, coordinating, and holding User Council meetings, and with preparing for and attending the meetings by council members.

- Project Management Support – Costs of, and associated with, stakeholder project managers, technical support and project office support staff, and other costs associated with the management, coordination, and support of ALMR operations.

The exhibits are provided following a brief description of the purpose and content of each exhibit.

Exhibit III-A: Total Cost Summary - The exhibit provides a summary of ALMR projected future annual costs by major cost category. Costs for FY 2009 have been projected based on information provided by the USDOD, SOA, and MOA. In general, annual costs for FY 2010 through FY 2025 have been projected by inflating the FY 2009 costs annually by 2.83%. The annual inflation rate of 2.83% is the average CPI for Anchorage for the previous three year for which CPI information is available (2005, 2006, and 2007). Costs provided on the exhibit are an accumulation of the costs provided on Exhibit III-B, C, and D.

Exhibit III-B: Projected Costs Based on Data Provided by USDOD & OMO - The exhibit provides future annual costs projected to be incurred by the USDOD for user oversight and coordination, costs for shared operations and maintenance, and system upgrades that will be shared by ALMR stakeholders. Costs were derived from information provided by the DOD ALMR Project Office and the current Operations Manager.

- Executive Council – Projected FY 2009 costs were developed by inflating the annual costs the USDOD ALMR Project Office provided for FY 2008 by 2.83%. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- User Council – Projected FY 2009 costs were developed by inflating the annual costs the USDOD ALMR Project Office provided for FY 2008 by 2.83%. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- Project Management Support – The USDOD did not provide any cost projections for FY 2009 or subsequent years.

- Operations Management Office – Projected FY 2009 costs were provided by the Operations Manager via a document titled "DRAFT FY 2009 Operating Budget, Alaska Land Mobile Radio (ALMR) Communications System, Operations Management Office" dated April 2008. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- System Management Office – Projected FY 2009 costs were provided by the Operations Manager via a document titled "DRAFT FY 2009 Operating Budget, Alaska Land Mobile Radio (ALMR) Communications System, Operations Management Office" dated April 2008. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- Equipment Maintenance – Projected FY 2009 costs were provided by the OMO Operations Manager via a document titled "FY 2009 Operating Budget, Alaska Land

Mobile Radio (ALMR) Communications System, Operations Management Office" dated April 2008. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%. Currently projected costs do not include the costs of nine additional sites which may be built out and incorporated into the System in the future. The addition of any new sites would increase the costs by $27,000 per year based on FY 2009 costs.

- Statewide Exercise Support – Projected FY 2010 costs were developed by annually inflating the costs the USDOD ALMR Project Office provided for FY 2008 by 2.83%. Annual costs for all subsequent years have been projected by inflating the FY 2010 costs annually by 2.83%.Costs.

- System Upgrades – Projected FY 2010 costs were provided by the USDOD ALMR Project Office. Annual costs for all subsequent years have been projected by inflating the FY 2010 costs annually by 2.83%.

Exhibit III-C: Projected Costs Based on Data provided by the State of Alaska - The exhibit provides future annual costs that are projected to be incurred by the SOA for user oversight and coordination, and costs for ALMR shared infrastructure usage of SATS circuits. Costs were derived from information provided by SOA ETS.

- Executive Council – Projected FY 2009 costs were provided by the ETS. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- User Council – Projected FY 2009 costs were provided by the ETS. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- Project Management Support – Projected FY 2009 costs were provided by the ETS. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%. Projected costs and calculation of SATS annual operating and maintenance costs are provided on Exhibit C-1.

- ALMR Usage of SATS, O&M - Projected future operating and maintenance costs for usage of SATS circuits by ALMR. Projected costs for FY 2009 have been determined by multiplying the ETS projected total FY 2009 costs to operate and maintain SATS by ALMR estimated SATS usage percentage of 6.75%. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%. Projected costs and calculation of SATS annual operating and maintenance costs are provided on Exhibit C-1.

Exhibit III-C.1: State of Alaska, SATS Projected Future Operating and Maintenance Costs - The exhibit provides ETS' projected operating and maintenance costs for FY 2009 through FY 2025 for SATS, ALMR support, and 2-Way radios; and the calculation of the projected annual costs attributable to ALMR for usage of SATS circuits. The projected cost information for FY 2009 was provided the ETS Deputy Director. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%. The SATS estimate usage percentage of 6.75% for ALMR was provided by the ETS ALMR Project Manager based on a circuit usage study completed by ETS staff.

Exhibit III-D: Projected Costs Based on Data provided by the Municipality of Anchorage - The exhibit provides future annual costs projected to be incurred by the MOA for user oversight and coordination, and costs for shared operations and maintenance that will be shared by ALMR stakeholders. Costs were derived from information provided by the MOA Director of Wireless Communications.

- Executive Council – Projected FY 2009 costs were provided by the MOA. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- User Council – Projected FY 2009 costs were provided by the MOA. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- Project Management Support – Projected FY 2009 costs were provided by the MOA. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- Equipment Maintenance – Projected FY 2009 equipment maintenance costs related to the Zone 3 Master Site controller maintained by MOA were provided by the MOA. The Zone 3 Master Site controller is classified as an ALMR shared infrastructure component in the Shared Infrastructure Cost Components Section of this Report. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

- Circuits – Projected FY 2009 costs for circuit usage related to the Zone 3 master site controller maintained by MOA were provided by the MOA. Annual costs for all subsequent years have been projected by inflating the FY 2009 costs annually by 2.83%.

This concludes the narrative of the Projected Future Cost Section. Section exhibits are provided on the following pages.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

PROJECTED FUTURE SHARED AND UNSHARED ALMR INFRASTRUCTURE COSTS
STATE FY 2009 THROUGH 2025
TOTAL COST SUMMARY

	SHARED OPERATIONS AND MAINTENANCE						SHARED CAPITAL OUTLAYS		TOTAL
FISCAL YEAR	OPER. MGMT. OFFICE	SYSTEM MGMT. OFFICE	EQUIP. MAINT.	CIRCUITS	TOTAL	STATEWIDE EXERCISE SUPPORT	SYSTEM UPGRADES	TOTAL	COSTS TO BE SHARED
2009	$629,000	$1,352,490	$2,897,984	$323,120	$5,202,594	$0	$0	$0	$5,202,594
2010	646,801	1,390,765	$3,253,403	$332,264	5,623,233	342,600	0	0	$5,965,833
2011	665,105	1,430,124	$3,345,474	$341,667	5,782,370	0	0	0	$5,782,370
2012	683,927	1,470,597	$3,440,151	$351,336	5,946,011	362,266	3,500,000	3,500,000	$9,808,277
2013	703,282	1,512,215	$3,537,507	$361,279	6,114,283	0		0	$6,114,283
2014	723,185	1,555,011	$3,637,618	$371,503	6,287,317	383,060		0	$6,670,377
2015	743,651	1,599,018	$3,740,563	$382,017	6,465,249	0	3,805,639	3,805,639	$10,270,888
2016	764,696	1,644,270	$3,846,421	$392,828	6,648,215	405,048		0	$7,053,263
2017	786,337	1,690,803	$3,955,275	$403,945	6,836,360	0		0	$6,836,360
2018	808,590	1,738,653	$4,067,209	$415,377	7,029,829	428,298	4,137,968	4,137,968	$11,596,095
2019	831,473	1,787,857	$4,182,311	$427,132	7,228,773	0		0	$7,228,773
2020	855,004	1,838,453	$4,300,670	$439,219	7,433,346	452,883		0	$7,886,229
2021	879,201	1,890,481	$4,422,379	$451,649	7,643,710	0	4,499,317	4,499,317	$12,143,027
2022	904,082	1,943,982	$4,547,532	$464,431	7,860,027	478,879		0	$8,338,906
2023	929,668	1,998,997	$4,676,227	$477,574	8,082,466	0		0	$8,082,466
2024	955,978	2,055,569	$4,808,564	$491,090	8,311,201	506,367	4,892,221	4,892,221	$13,709,789
2025	983,032	2,113,742	$4,944,646	$504,988	8,546,408	0	0	0	$8,546,408
Total Costs	$13,493,012	$29,013,027	$67,603,934	$6,931,419	$117,041,392	$3,359,401	$20,835,145	$20,835,145	$141,235,938

* Estimated costs based on FY 2009 costs inflated by 2.83% annually. Inflation rate based on average CPI for Anchorage for 2005 through 2007.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

PROJECTED FUTURE SHARED AND UNSHARED ALMR INFRASTRUCTURE COSTS
STATE FY 2009 THROUGH 2025
TOTAL COST SUMMARY

	OVERSIGHT AND COORDINATION - NOT SHARED				
FISCAL YEAR	EXECUTIVE COUNCIL	USER COUNCIL	PROJECT MGMT	TOTAL	GRAND TOTAL
2009	$53,283	$56,453	$153,500	$263,236	$5,465,830
2010	54,791	58,051	157,844	270,686	6,236,519
2011	56,341	59,694	162,312	278,347	6,060,717
2012	57,936	61,383	166,905	286,224	10,094,501
2013	59,575	63,120	171,628	294,323	6,408,606
2014	61,261	64,906	176,485	302,652	6,973,029
2015	62,996	66,743	181,480	311,219	10,582,107
2016	64,778	68,631	186,616	320,025	7,373,288
2017	66,611	70,574	191,897	329,082	7,165,442
2018	68,496	72,571	197,328	338,395	11,934,490
2019	70,434	74,626	202,912	347,972	7,576,745
2020	72,427	76,737	208,654	357,818	8,244,047
2021	74,477	78,909	214,558	367,944	12,510,971
2022	76,585	81,142	220,630	378,357	8,717,263
2023	78,752	83,438	226,874	389,064	8,471,530
2024	80,981	85,799	233,295	400,075	14,109,864
2025	83,272	88,228	239,897	411,397	8,957,805
Total Costs	$1,142,996	$1,211,005	$3,292,815	$5,646,816	$146,882,754

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

PROJECTED FUTURE ALMR SHARED INFRASTRUCTURE COSTS
STATE FISCAL YEARS 2009 THROUGH 2025
PROJECTED COSTS BASED ON DATA FROM USDOD AND THE OMO

	USER OVERSIGHT AND COORDINATION				SHARED OPERATIONS AND MAINTENANCE						
FISCAL YEAR	EXECUTIVE COUNCIL	USER COUNCIL	PROJECT MGMT	TOTAL	OPER. MGMT. OFFICE	SYSTEM MGMT. OFFICE	EQUIP. MAINT.	STATEWIDE EXERCISE SUPPORT	TOTAL	SYSTEM UPGRADES	GRAND TOTAL
2009	$10,283	$16,453	$0	$26,736	$629,000	$1,352,490	$2,897,984	$0	$4,879,474	$0	$4,906,210
2010	10,574	16,919	0	27,493	646,801	1,390,765	3,253,403	342,600	5,633,569		5,661,062
2011	10,873	17,398	0	28,271	665,105	1,430,124	3,345,474		5,440,703		5,468,974
2012	11,181	17,890	0	29,071	683,927	1,470,597	3,440,151	362,266	5,956,941	3,500,000	9,486,012
2013	11,497	18,396	0	29,893	703,282	1,512,215	3,537,507		5,753,004		5,782,897
2014	11,822	18,917	0	30,739	723,185	1,555,011	3,637,618	383,060	6,298,874		6,329,613
2015	12,157	19,452	0	31,609	743,651	1,599,018	3,740,563		6,083,232	3,805,639	9,920,480
2016	12,501	20,002	0	32,503	764,696	1,644,270	3,846,421	405,048	6,660,435		6,692,938
2017	12,855	20,568	0	33,423	786,337	1,690,803	3,955,275		6,432,415		6,465,838
2018	13,219	21,150	0	34,369	808,590	1,738,653	4,067,209	428,298	7,042,750	4,137,968	11,215,087
2019	13,593	21,749	0	35,342	831,473	1,787,857	4,182,311		6,801,641		6,836,983
2020	13,978	22,364	0	36,342	855,004	1,838,453	4,300,670	452,883	7,447,010		7,483,352
2021	14,374	22,997	0	37,371	879,201	1,890,481	4,422,379		7,192,061	4,499,317	11,728,749
2022	14,781	23,648	0	38,429	904,082	1,943,982	4,547,532	478,879	7,874,475		7,912,904
2023	15,199	24,317	0	39,516	929,668	1,998,997	4,676,227		7,604,892		7,644,408
2024	15,629	25,005	0	40,634	955,978	2,055,569	4,808,564	506,367	8,326,478	4,892,221	13,259,333
2025	16,071	25,713	0	41,784	983,032	2,113,742	4,944,646		8,041,420		8,083,204
Total Costs	$220,587	$352,938	$0	$573,525	$13,493,012	$29,013,027	$67,603,934	$3,359,401	$113,469,374	$20,835,145	$134,878,044

* Estimated costs based on FY 2009 costs inflated by 2.83% annually. Inflation rate based on average CPI for Anchorage for 2005 through 2007.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

STATE OF ALASKA
PROJECTED FUTURE ALMR SHARED AND UNSHARED INFRASTRUCTURE COSTS
STATE FISCAL YEARS 2009 THROUGH 2025
PROJECTED COSTS BASED ON DATA PROVIDED BY THE STATE OF ALASKA

STATE FISCAL YEAR	USER OVERSIGHT AND COORDINATION				ALMR USAGE OF SATS CIRCUITS (6.75%)		GRAND TOTAL
	EXECUTIVE COUNCIL	USER COUNCIL	PROJECT MGMT	TOTAL	O&M	TOTAL	
2009	$42,000	$38,500	$146,500	$227,000	$323,120	$323,120	$550,120
2010	43,189	39,590	150,646	233,425	332,264	332,264	565,689
2011	44,411	40,710	154,910	240,031	341,667	341,667	581,698
2012	45,668	41,862	159,294	246,824	351,336	351,336	598,160
2013	46,960	43,047	163,802	253,809	361,279	361,279	615,088
2014	48,289	44,265	168,438	260,992	371,503	371,503	632,495
2015	49,656	45,518	173,205	268,379	382,017	382,017	650,396
2016	51,061	46,806	178,107	275,974	392,828	392,828	668,802
2017	52,506	48,131	183,147	283,784	403,945	403,945	687,729
2018	53,992	49,493	188,330	291,815	415,377	415,377	707,192
2019	55,520	50,894	193,659	300,073	427,132	427,132	727,205
2020	57,091	52,334	199,139	308,564	439,219	439,219	747,783
2021	58,707	53,815	204,774	317,296	451,649	451,649	768,945
2022	60,368	55,338	210,569	326,275	464,431	464,431	790,706
2023	62,076	56,904	216,528	335,508	477,574	477,574	813,082
2024	63,833	58,514	222,656	345,003	491,090	491,090	836,093
2025	65,639	60,170	228,957	354,766	504,988	504,988	859,754
Total Costs	$900,966	$825,891	$3,142,661	$4,869,518	$6,931,419	$6,931,419	$11,800,937

* Costs based on estimated FY 2009 costs inflated by 2.83% annually. Inflation rate based on average CPI for Anchorage for 2005 through 2007.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

PROJECTED UNSHARED FUTURE ALMR COSTS
STATE FISCAL YEARS 2009 THROUGH 2025
PROJECTED COSTS BASED ON DATA PROVIDED BY THE MUNICIPALITY OF ANCHORAGE

	USER OVERSIGHT AND COORDINATION				OPERATIONS AND MAINTENANCE			
FISCAL YEAR	EXECUTIVE COUNCIL	USER COUNCIL	PROJECT MGMT	TOTAL	EQUIP. MAINT.	CIRCUITS	TOTAL	GRAND TOTAL
2009	$1,000	$1,500	$7,000	$9,500	$9,000	$7,500	$16,500	$26,000
2010	1,028	1,542	7,198	9,768	9,255	7,712	16,967	26,735
2011	1,057	1,586	7,402	10,045	9,517	7,930	17,447	27,492
2012	1,087	1,631	7,611	10,329	9,786	8,154	17,940	28,269
2013	1,118	1,677	7,826	10,621	10,063	8,385	18,448	29,069
2014	1,150	1,724	8,047	10,921	10,348	8,622	18,970	29,891
2015	1,183	1,773	8,275	11,231	10,641	8,866	19,507	30,738
2016	1,216	1,823	8,509	11,548	10,942	9,117	20,059	31,607
2017	1,250	1,875	8,750	11,875	11,252	9,375	20,627	32,502
2018	1,285	1,928	8,998	12,211	11,570	9,640	21,210	33,421
2019	1,321	1,983	9,253	12,557	11,897	9,913	21,810	34,367
2020	1,358	2,039	9,515	12,912	12,234	10,194	22,428	35,340
2021	1,396	2,097	9,784	13,277	12,580	10,482	23,062	36,339
2022	1,436	2,156	10,061	13,653	12,936	10,779	23,715	37,368
2023	1,477	2,217	10,346	14,040	13,302	11,084	24,386	38,426
2024	1,519	2,280	10,639	14,438	13,678	11,398	25,076	39,514
2025	1,562	2,345	10,940	14,847	14,065	11,721	25,786	40,633
Total Costs	$21,443	$32,176	$150,154	$203,773	$193,066	$160,872	$353,938	$557,711

* Costs based on estimated FY 2009 costs inflated by 2.83% annually. Inflation rate based on average CPI for Anchorage for 2005 through 2007.

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Alaska Land Mobile Radio Communications System
Total Cost of Ownership Study
Benchmarking Section

Alaska Land Mobile Radio Communications System
Total Cost of Ownership Study
Benchmarking Section

As part of the process for developing a long term-strategy for the management, operation, maintenance, and funding of ALMR, the ALMR stakeholders requested a questionnaire be developed and transmitted to other statewide land mobile radio systems with comparable system size and technology to ALMR. The primary focus of the questionnaire was to be the acquisition of information from other similar systems that would assist ALMR Stakeholders in the development of a cost efficient system, and in the development of a method for funding the ongoing operation and maintenance of ALMR. The objective of this section of the TCO is to provide the information that was acquired and its relevance.

Questionnaire Content and States Contacted

A questionnaire was developed and transmitted to eight states that either have or are in the processing of implementing a similar system to ALMR. The questionnaire was developed and approved by representatives of the USDOD, SOA, and MOA. The final questionnaire is provided at the end of this Section as Exhibit IV-B. The questionnaire focused on obtaining information in the following six areas:

- System configuration – Information on the interoperable software and connectivity technology utilized; the vendor(s) from which the infrastructure system and subscriber equipment were obtained; and the number of sites comprising the system.

- Types of users and number of subscriber units – The number of subscriber units on the system and the types of users served: state, local, and federal.

- Organization responsibilities and composition – Management entity responsibilities and the number and type of positions in the organization.

- Build-out cost and funding – Total costs for build-out/implementation of the system, and the amount of funding utilized from each funding source.

- Annual operating and maintenance costs – Total annual costs for management, operation, and maintenance of the system.

- Annual operating and maintenance funding – The source of funding for on-going operations and maintenance. Including the identification of any special levies and/or subscriber and usage fees utilized to fund annual operations.

Five of the nine state entities were identified by representatives of the ALMR stakeholder to be sent a questionnaire returned a completed questionnaire. One state entity only returned a partially complete questionnaire, and two state entities did not return the questionnaire. Although follow up e-mails and telephone calls were made to the two non-responding state entities, no information was received. As a result of the initial information received from the responding entities and additional information requested by ALMR stakeholder representatives, subsequent contact was made with the responding state entities to clarify information received and acquire additional information. Following are the state entities that were sent a questionnaire, and the status of their responses:

- Colorado, Statewide Digital Trunked Radio System (DTRS) – Received a completed questionnaire and responses to additional information requests.
- Illinois, Illinois Statewide Radio Communications – Did not respond.
- Indiana, Project Hoosier SAFE-t - Received a completed questionnaire and responses to additional information requests.
- Michigan, Michigan Public Safety Commission Communications System (MPSCS) - Received a completed questionnaire and responses to additional information requests.
- Pennsylvania, PA-StarNet - Received a completed questionnaire and responses to additional information requests.
- South Carolina, Palmetto 800 Network - Received a completed questionnaire and responses to additional information requests.
- Virginia, Virginia Interoperable Communications - Did not respond.
- Wyoming, WyoLink - Received a partially completed questionnaire and no response to additional information requests. Wyoming is in the initial phase of developing a statewide system. Most of the information requested was unknown at this time.

As anticipated, the information varied significantly between the states due to the population size and density of the responding states, the size of the area covered, the number of entities in the state, their topographical characteristics, and the equipment they are responsible for operating and maintaining. Exhibit IV-A, provided at the end of this section, provides a synopsis of the questionnaire responses received from the responding state entities. A brief review of the information provided, and its relevance, was provided in the Executive Summary. Additional information is provided in the following tables and narrative.

System Configuration

All of the states are using the same or very similar interoperable system software and connectivity technology. Four of the five states are using Motorola-acquired system technology for their infrastructure. Indiana and South Carolina are using the same, or an earlier version of, the Motorola SmartZone™ technology utilized by ALMR. Table IV.1 provides a synopsis of the system software and connectivity information.

Table IV.1
System Configuration
Technology and Vendors

State	System Software	Connectivity	Vendors
Alaska	Motorola SmartZone 7.1 trunked VHF System.	IP network using digital microwave in the 6 GHZ for bands.	System infrastructure is Motorola. Microwave network is Harris. Subscribers use Motorola, Kenwood, EF Johnson and (soon) MACOM.
Colorado	Project 25 Standards based 800 MHz digital trunking	IP network using digital microwave in the 6, 10, 11 and 18 GHZ for bands	System infrastructure is Motorola. Microwave network is Alcatel. Subscribers use Motorola, Kenwood, EF Johnson and MACOM operating systems.
Indiana	Motorola Astro SmartZone Omni-link 800MHz 4 zone system. Dual mode (analog and digital) modulation schema.	Each site is connected to the respective zone master site via T1 to a concentrator site or direct to the master site using AT&T in combination with the Indiana State Police microwave statewide backbone.	Motorola is prime contractor with 10 year master contract for overall implementation. Motorola has maintenance contract through 2010.
Michigan	Instructed to see web site http://www.michigan.gov/mpscs for information. I could not find information on web site.	Instructed to see web site http://www.michigan.gov/mpscs for information. I could not find information on web site.	System infrastructure is Motorola. Microwave network is Alcatel.
Pennsylvania	MACOM OpenSky digital trunked 800 MHz radio network using TDMA 2 and 4 slot.	Use gateways to connect to other systems and frequencies. In some cases have supplied control stations on their network to facilitate connectivity.	M/A-COM for radio system. Alcatel Lucent for Microwave. RCC Consultants for QA and engineering support.
South Carolina	Motorola SmartZone 4.1 trunked 800 MHz System. System has IR and simulcast sites; and complete 800 MHz conventional repeater overlay.	T-1 mainly, some microwave.	Motorola

Build-out Funding

Only in Alaska has the primary funding source for the statewide system been federal funds. Although Colorado (33.4 percent) and Indiana (14.5 percent) did utilize federal funding, the five responding states primarily funded their systems through general fund appropriations and special levies. The older systems in Michigan, Pennsylvania, and South Carolina were funded entirely through state general fund appropriations. Indiana funded approximately 77 percent of their

costs through a special levy created by the Indiana General Assembly. The Assembly dedicated $1.25 of certain fees collected by the State's Bureau of Motor Vehicles to fund costs associated with the construction, operation, and maintenance of the system infrastructure. Table IV.7 provides the funding sources utilized by each state.

Table IV.7
Buildout/Implementation/Funding
(In thousands)

State	Federal	State	Special Levies	Local	Total
Alaska	$140,744 72.11%	$47,308 24.24%	$0	$7,121 3.65%	$195,173
Colorado	48,900 33.36%	51,000 34.79%	0	46,700 31.86%	146,600
Indiana	11,606 14.51%	6,709 8.39%	61,685 77.11%	0	80,000
Michigan	0	230,000 100.00%	0	0	230,000
Pennsylvania	0	500,000 100.00%	0	0	500,000
South Carolina	0	80,000 100.00%	0	0	80,000

Table IV.8 provides the funding sources currently utilized by each state to fund their annual operating and maintenance costs.

Table IV.8
Annual Operating and Maintenance Funding
(In thousands)

State	Federal	State	Special Levies	Subscriber Fees	Total
Colorado	$0	$0	$0	$3,900 100.00%	$3,900
Indiana	0	0	12,000 100.00%	0	12,000
Michigan	0	14,500 90.63%	0	1,500 9.38%	16,000
Pennsylvania	0	28,000 100.00%	0	0	28,000
South Carolina	0	0	0	11,000 100.00%	11,000

This concludes the narrative of the Benchmarking Section. Section exhibits are provided on the following pages.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

BENCHMARKING QUESTIONNAIRE SYNOPSIS

TOPIC DESCRIPTION	ALASKA	COLORADO	INDIANA	MICHIGAN	PENNSYLVANIA	SOUTH CAROLINA
System Name	Alaska Land Mobile Radio System (ALMR)	Statewide Digital Trunked Radio System (DTRS)	Project Hoosier SAFE-t	Michigan Public Safety Commission Communications System (MPSCS)	PA-StarNet	Palmetto 800 Network
Contact Information						
Name	Del Smith	Mike Borrego	David C. Smith	Mike Scieszka	Charles Brennan	George Crouch
Title	Operations Manager	Project Manager	Director of Implementation	Acting Director	Deputy Secretary	State Wireless Manager
Phone	907-334-2636	303-866-2558	317-233-9169	517-336-6620	717-772-8006	803-896-0367
E-mail	DelSmith@5starteam.net	mike.borrego@state.co.us	dsmith@ipsc.in.gov	scieszkam@michigan.gov	chabrennan@state.pa.us	gcrouch@cio.sc.gov
Responsible Entity						
Title	ALMR Operations Management Office	Division of Information Technologies	Integrated Public Safety Commission	Department of Information Technology	Office of Public Safety Radio Services	Division of the State Chief Information Officer
Number of Positions						
Management and Admin.	2	2	2	2	4	3
Finance and Billing	0	2	3	3	1	0
Help Desk	1	4	2	9	13	0
Operations	4	6	3	6	12	0
Maintenance	2	35	0	50	0	0
Total	9	49	10	70	30	3
Maintenance Responsibility	Only responsible for shared infrastructure components	Responsible for the majority of the infrastructure and backbone. They only do maintenance on subscriber units for State agencies.	Only responsible for State owned infrastructure.	Responsible for State owned infrastructure and subscriber units.	Responsible for State owned infrastructure and subscriber units.	Only responsible for State owned infrastructure.
Provision of Maintenance	Provided through a contract with Motorola	Provided by State employees.	Provided through a contract with Motorola	Provided by State employees.	Provided through multiple vendor contracts.	Provided through multiple vendor contracts and by larger system users.
System Configuration						
System Software	Motorola SmartZone 7.1 trunked VHF System.	Project 25 Standards based 800 MHz digital trunking	Motorola Astro SmartZone Omni-link 800MHz 4 zone system. Dual mode (analog and digital) modulation schema.	Information not provided.	MACOM OpenSky digital trunked 800 MHz radio network using TDMA 2 and 4 slot.	Motorola SmartZone 4.1 trunked 800 MHz System. System has IR and simulcast sites; and complete 800 MHz conventional repeater overlay.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)
TOTAL COST OF OWNERSHIP STUDY

BENCHMARKING QUESTIONNAIRE SYNOPSIS

TOPIC DESCRIPTION	ALASKA	COLORADO	INDIANA	MICHIGAN	PENNSYLVANIA	SOUTH CAROLINA
Connectivity	IP network using digital microwave in the 6 GHZ for bands.	IP network using digital microwave in the 6, 10, 11 and 18 GHZ for bands	Each site is connected to the respective zone master site via T1 to a concentrator site or direct to the master site using AT&T in combination with the Indiana State Police microwave statewide backbone.	Information not provided.	Use gateways to connect to other systems and frequencies. In some cases have supplied control stations on their network to facilitate connectivity.	T-1 mainly, some microwave.
System Vendor	System infrastructure is Motorola. Microwave network is Harris. Subscribers use Motorola, Kenwood, EF Johnson and (soon) MACOM.	System infrastructure is Motorola. Microwave network is Alcatel. Subscribers use Motorola, Kenwood, EF Johnson and MACOM operating systems.	Motorola is prime contractor with 10 year master contract for overall implementation. Motorola has maintenance contract through 2010.	System infrastructure is Motorola. Microwave network is Alcatel.	M/A-COM for radio system. Alcatel Lucent for Microwave. RCC Consultants for QA and engineering support.	Motorola
Number of Sites						
Current	82	153	134	220	550	158
Additional Planned	8	37	16		300	
Total to be Built	90	190	150	220	850	158
Number of Subscriber Units						
Current Number of Units	11,000	27,000	34,000	44,000	15,000	23,000
Projected Number of Units	15,000	30,000	55,000	70,000	25,000	30,000
Types of Users on the System						
Federal	Yes	Yes	Yes	Yes	No	Yes
State	Yes	Yes	Yes	Yes	Yes	Yes
Local	Yes	Yes	Yes	Yes	No	Yes
Cost and Funding						
Build-Out/Implementation						
Total Costs	$195,173,000	$146,600,000	$80,000,000	$230,000,000	$500,000,000	$80,000,000
Components Included	Includes infrastructure and subscriber, but does not include the majority of the microwave backbone that was already in place.	Includes infrastructure and subscriber, but does not include the majority of the microwave backbone or about 85 sites that were already in place.	Includes costs of infrastructure and site construction work, excluding towers. Subscriber equipment costs are the responsibility of each participating agency.	Includes cost of infrastructure and equipment for about 3,000 users.	Includes all state owned infrastructure and subscriber units.	Only includes cost of infrastructure equipment.

BENCHMARKING QUESTIONNAIRE SYNOPSIS

TOPIC DESCRIPTION	ALASKA	COLORADO	INDIANA	MICHIGAN	PENNSYLVANIA	SOUTH CAROLINA
Funding						
Federal	$140,744,000	$48,900,000	$11,606,042	$0	$0	$0
State Appropriations	47,308,000	51,000,000	6,709,092	230,000,000	500,000,000	80,000,000
Taxes and/or Special Levies	0	0	61,684,866	0	0	0
Local Appropriations	7,121,000	46,700,000	0	0	0	0
Total Funding	$195,173,000	$146,600,000	$80,000,000	$230,000,000	$500,000,000	$80,000,000
Annual Operations						
Current Costs	$5,202,000	$3,900,000	$12,000,000	$16,000,000	$28,000,000	$11,000,000
Components Included	Includes operations and maintenance for shared infrastructure components.	Includes operations and maintenance for State owned infrastructure.	Includes operations and maintenance for State owned infrastructure.	Includes operations and maintenance for State owned infrastructure and subscriber units. With equipment beginning to hit the end of their life cycle, projecting cost will soon increase to over $20 million annually.	Includes operations and maintenance for State infrastructure and subscriber units.	Includes operations and maintenance of the RF and backbone infrastructure, and 24 hour system monitoring. Not included are costs incurred by large users that are credited against their service charges.
Funding	To be determined.					
Federal		$0	$0	$0	$0	$0
State Appropriations		0	0	14,500,000	28,000,000	0
Taxes and/or Special Levies		0	12,000,000	0	0	0
Subscriber/Usage Fees		3,900,000	0	1,500,000	0	11,000,000
Total Funding	$0	$3,900,000	$12,000,000	$16,000,000	$28,000,000	$11,000,000
Special Levies	None	None	Dedicated fund of $1.25 on certain Bureau of Motor Vehicle fees such as drivers licenses, and vehicle and boat registrations. Generates approximately $13 million annually to support operations and debt repayment.	None	None	None

BENCHMARKING QUESTIONNAIRE SYNOPSIS

TOPIC DESCRIPTION	ALASKA	COLORADO	INDIANA	MICHIGAN	PENNSYLVANIA	SOUTH CAROLINA
Subscriber Fees	To be determined.	Charges a user fee of $265 per year per subscriber unit only to State agencies. No charges to federal or local users. Some local governments charge internal fees to support their internal maintenance and operations. Those fees range from $12 to $40 per month per subscriber unit.	No subscriber fees are charged to anyone operating on the system.	Tiered fee scale from $200 per year to $0 per year. They have subscriber fees but a significant amount of local fees are waived per local credit policy that encourages infrastructure integration. Otherwise, all users are charged the same rates and fees.	No subscriber fees are charged.	Monthly fees for basic dispatch services and system features; and annual radio ID fees for federal agency mutal aid and interoperability system access.

Area-Wide Land Mobile Radio Network Questionnaire

Federal, state, and local agencies in Alaska are in the process of implementing a mobile radio system that will provide reliable and secure interoperable communications for first responders, especially during emergencies, critical situations, and multiple agency exercises. The System, the Alaska Land Mobile Radio System (ALMR), is a digital trunked, wide–area network shared communication system that is being implemented and is to be operated under a cooperative agreement between the principal stakeholders: the U.S. Department of Defense, the State of Alaska, and the Federal Executive Association of Alaska. The principal stakeholders are in the process of implementing a communication strategy that will ensure ALMR is implemented and operated in accordance with guidelines established and endorsed by the Association of Public Safety Communications Officials for interoperability.

As part of the process for developing a long term strategy for the management, operation, maintenance, and funding of ALMR, the ALMR Stakeholders have developed this questionnaire. The objective of the questionnaire is to acquire information from other similar systems that will enable the development of an effective, cost efficient system, and a method for funding the ongoing operation and maintenance of ALMR.

As a state that either has or is in the processing of implementing a similar system, we are requesting information on your system. Your response to any or all of the following questions is greatly appreciated. We are requesting the completed questionnaire be e-mailed to ALMR's Operations Manager, Mr. Del Smith, at delsmith@5starteam.net. If you have questions concerning the questionnaire, you may contact Mr. Smith either by e-mail or by phone at (907) 334-2636.

1. Contact Information – The person responsible for completing the questionnaire or that should be contacted for clarification.

- Contact Name: _____
- Contact Title: _____
- Contact Phone: _____
- Contact E-mail: _____

2. Name of System: _____

3. Organization – Entity responsible for the management, operation, and maintenance of the State's system.

- Title of Organization: _____
- Number of each type of position in the Organization:
  - Management and Administrative: _____
  - Finance and Billing: _____
  - Help Desk: _____
  - Operations: _____
  - Maintenance: _____
    - Total: _____

4. System Configuration – What interoperable software and connectivity options does your system utilize?

- Technology:

_____

_____

_____

- Connectivity:

_____

_____

_____

- Vendors utilized:

_____

_____

_____

- Number of sites:

_____

_____

_____

5. Number of subscriber units – How many radios and other devices are currently utilizing your system and what is the projected total number of devices that may be on the system?

- Current number of units: _____
- Projected total number of units: _____

6. Cost and Funding

- Build-out/implementation
  - What were the total costs for build-out/implementation of your system?

    _____
  - How were the costs funded?
    - Federal grants and contracts: _____
    - State government appropriations: _____
    - Taxes and/or special levies: _____
    - Local governments appropriations: _____
    - Subscriber and/or usage fees: _____
    - Other sources: _____
      - Total: _____

- Annual management, operations, and maintenance
    - What are the total annual costs for management, operations, and maintenance of the system?

      _____

    - How are the annual costs funded?
        - Federal grants and contracts: _____
        - State government appropriations: _____
        - Taxes and/or special levies: _____
        - Local governments appropriations: _____
        - Subscriber and/or usage fees: _____
        - Other sources: _____
            - Total: _____

7. **Subscriber -** If a source of funding for either build-out or annual operations is through subscriber and/or usage fees, please provide the current fee amount and the method for determining the fees:

   _____

   _____

   _____

   _____

   _____

Alaska Land Mobile Radio Communications System
Total Cost of Ownership Study
Cost Components Section

Alaska Land Mobile Radio Communication System
Total Cost of Ownership Study
Cost Components Section

The objective of this Section of the TCO is to identify the system components that comprise ALMR's shared infrastructure; and the types of costs that have been or will be incurred in the management, implementation, and operation and maintenance (O&M) of the ALMR Shared Infrastructure. System component information was derived from the draft Services Level Agreement (SLA), version 6.0, dated December 4, 2006, and through meetings and discussions with Stakeholder staffs. Section information is presented in two subsections: System Components and Cost Components. The System Components subsection identifies all the components of ALMR and identifies for each component whether it is an ALMR shared infrastructure component or a user component. The Cost Components subsection identifies the type of costs for each shared infrastructure component included in determining the total cost of ownership.

System Components

ALMR is comprised of shared infrastructure and user communication components. Shared infrastructure components are components essential for the operation of the system and benefit all system users. User communication components enable a user to access the shared infrastructure for its benefit. User communication components consist of the radios and equipment required by users for access and communication over ALMR.

ALMR Executive Council

In a memorandum of understanding (MOU) dated April 4, 2001, the ALMR Executive Council was given responsibility for providing oversight and direction of ALMR. The Executive Council is comprised of three equal co-chairs representing U.S. Department of Defense (USDOD), the State of Alaska (SOA), and the Federal Executives Association of Alaska (FEA). The Municipality of Anchorage and The Alaska Municipal League are associated members that do not vote.

The ALMR Executive Council is classified as an ALMR Shared Infrastructure component. Costs of and associated with the ALMR Executive Council ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

ALMR User Council

The ALMR User Council is comprised of twelve (12) members representing each of the four major users: USDOD, FEA, SOA, and local government. The User Council is governed by a Charter that was approved by the ALMR Executive Council. User Council responsibilities include establishing operations and maintenance policies and standards for ALMR, defining the

level of ALMR System maintenance and operations services required, evaluating the performance of ALMR, and providing direction to the ALMR Operations Manager on the operation and maintenance of ALMR.

The ALMR User Council is classified as an ALMR Shared Infrastructure component. Costs of and associated with the ALMR User Council ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Joint Project Management Team

USDOD and SOA have shared responsibility for the development and implementation of ALMR. In order to economically and effectively manage ALMR's development and implementation, USDOD and SOA have assigned staff to a Joint Project Management Team (JPMT). In addition, consultants have been contracted to assist the JPMT. Members of the JPMT have been responsible for the managing and overseeing the development of ALMR system requirements, policies, procedures, contracting, software procurement, site development, equipment selection and acquisition, and other activities necessary for the development and subsequent operation and maintenance of the system. Upon total completion of the implementation, transition, and cut over phases, the JPMT will be dissolved. As shared infrastructure is cut over to full operations, JPMT responsibilities and governances will be assumed by the ALMR User Council and Operations Management Office.

The JPMT is classified as an ALMR Shared Infrastructure component. Costs of and associated with the JPMT ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Stakeholder Project Management

USDOD and SOA have project managers that are responsible for managing each stakeholder's activities related to ALMR. Responsibilities include attending ALMR Executive Council and User Council meetings, providing information to and assisting the JPMT, providing technical assistance in the development and implementation of the system infrastructure, assisting in the development of ALMR policies and procedures, and assisting stakeholder entities in acquiring the necessary information and equipment to access and utilize ALMR.

- Shared Infrastructure - Activities of the stakeholder project managers benefiting all stakeholders are classified as ALMR Shared Infrastructure components. Costs of and associated with these activities ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- User Infrastructure – Activities of the stakeholder project managers only benefiting their stakeholder entity are classified as User Infrastructure components. Costs of and associated with these activities ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Stakeholder Technical Support Services

Technical support services have been provided by stakeholder staff during the development, construction, and implementation of ALMR. Services have been provided in support of the ALMR Shared Infrastructure and stakeholder entities. It is anticipated that once ALMR is fully deployed and/or the Operations Management Office is fully staffed that support of the ALMR Shared Infrastructure by stakeholder technical staff will be minimal.

- Shared Infrastructure – Technical support services provided by stakeholder staff benefiting all stakeholders is classified as an ALMR Shared Infrastructure component. Costs of and associated with this support ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- User Infrastructure – Technical support services provided by stakeholder staff only benefiting their stakeholder entity is classified as a User Infrastructure component. Costs of and associated with this support ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Administrative and Management Services

Administrative and management services in support of ALMR shared infrastructure have been provided by stakeholder staff and through service contracts. It is anticipated that once ALMR is fully deployed and/or the Operations Management Office (OMO) is fully staffed that all administrative and management services in support of the ALMR shared infrastructure sites and equipment will be provided either by OMO staff or through service contracts managed by OMO staff. Administrative and management services provided in support of the ALMR shared infrastructure operations are classified as an ALMR Shared Infrastructure component. Costs of and associated with these services ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Administrative and management services are presented in the Administration/Management section (Section 2.7), and Appendix C, Operations and Maintenance Processes and Procedures, of the ALMR Service Level Agreement (SLA). Although not all administrative and management services, following are examples of administrative and management services being provided and/or will need to be provided:

- General Management – Oversight of the day-to-day operations of the ALMR Shared Infrastructure. Activities include coordinating and performing a range of operational and administrative activities in direct support of delivering 24x7 ALMR services; developing and administering strategic and operating plans; developing and maintaining relationships with program managers of the ALMR stakeholders, and with current and prospective ALMR users; and providing support, reports, and recommendations to the ALMR User Council and ALMR Executive Council.

- Administrative Support – Provision of administrative support to ALMR Executive Council, ALMR User Council, JMPT, and staff associated with the development, construction, implementation, operation and maintenance of the ALMR System Infrastructure. Activities include reception; coordinating and holding meetings; procurement of supplies and services: arranging travel; assisting in the development and distribution of meeting and technical materials; formatting and preparing documents for electronic and/or printed publication, including the assembly of documentation; and updating documents and distributing updates to interested parties.

- Fiscal Services - Developing and maintaining ALMR budgets, accounting records, and financial reports. Activities includes development and monitoring of ALMR's budgets; payment of invoices; receipt and recording of funds; monitoring of expenditures and funding; managing grants; and developing and maintaining financial databases, cost models, financial reports and schedules for the Operations Manager, ALMR User Council and ALMR Executive Council. Also includes the cost associated with an annual audit.

- Wide Area System Management – Management of the delivery of all ALMR services requirements and service agreements. Activities include interfacing with the user-designated representatives on ALMR management issues; directing daily and emergency ALMR technology management, and administration functions to meet the operational needs of the User Council as stated in the SLA; technical management, operation and oversight of the ALMR shared infrastructure hardware and software; and ensuring that ALMR technology performance meets the operational needs of users day to day, and during emergencies.

- System Maintenance and Technical Support – Providing technical support and ensuring maintenance of ALMR. Activities include providing technical support and operational availability; responding to requests for technical support; performing system simulations of current released manufacturing supported versions; advising users of procedures used for ALMR restoration or issue resolution; coordinating issue resolution with service technicians in the field; providing a single focal point for any systemic issue, and manage the issue to resolution; escalating the case number to appropriate party/parties upon expiration of the applicable response time; and implementing changes to the database and escalation procedures.

- Network Operations and Support - Operation and oversight of the local area network (LAN) and wide area network (WAN); and ensuring the LAN and WAN networks meet ALMR requirements. Activities include diagnosis of network performance problems and the development of corrective action recommendations; dispatching appropriate repair services in the event of network malfunction or outages; notifying the Operations Manager and users of any network malfunctions that may affect the system or system regional areas; monitoring the performance of the entire network for normal operations, particularly the performance of the common equipment; and providing timely

information to the Operations Manager and User Council on any network issue that arises or repair/maintenance issue related to the common equipment.

- Radio Frequency (RF) Spectrum Management Support - Provision of RF spectrum management support to local, state, and federal government wireless programs. Activities include assisting user managers with developing RF plans that support wireless communications systems; frequency coordination; preparing radio frequency applications to obtain spectrum authorization; resolution of radio frequency interference problems; and conducting emitter surveys to ensure radio frequency authorizations are accurate.

- Radio Frequency Support – Provision of support through the analysis of field and vendor data related to RF and communications system performance that ensures the success of user radio products. Activities include oversight of vendor and State of Alaska preventive maintenance procedures to ensure they meet ALMR SLA requirements; supporting analysis efforts needed for product development; assisting with projects and work programs to improve the performance and reliability of RF systems equipment; and providing RF advice, information, and guidance to ALMR users.

- Security/Information Assurance – Provision of security and information assurance administrative and technical support for the System and users. Activities include monitoring information assurance (IA) security issues as they pertain to ALMR and USDOD; performing compliance reviews to ensure IA security measures are in place and maintained; developing IA policies to maintain integrity and availability of the information systems; developing and deploying plans of action to comply with and respond to USDOD tasking orders; and tracking of virus activity and verification of command's defensive posture to prevent system-wide infections.

- Training – Provision of training for users to ensure they have the knowledge necessary to properly operate ALMR mobile and portable communications equipment through classroom, small ground and/or one-on-one training. Activities include development of training materials and resources; creating fresh approaches to presenting technical training information to users; updating training material to reflect feedback from ALMR users; maintaining training equipment, including software and hardware; and creating and maintaining information on the internet.

- Statewide Exercise Support – Assistance in the planning, coordination, and support of statewide exercises designed to test ALMR and ensure interoperability communications for first responders in Alaska during emergencies, critical situations, and multiple agency exercises.

- Administrative Software – Includes Track-It help desk software, the Project Server/Share Point software used to track and manage documents and project schedules, and other software used in the coordination and management of ALMR.

System Software

ALMR utilizes Motorola ASTRO 25™ Digital Trunking WAN SmartZone solutions software to manage and operate the system. In addition to the original procurement, updates to the software have been and will be procured. The software is classified as an ALMR Shared Infrastructure component. Costs of and associated with the original software and updates ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Equipment Operations and Maintenance Services

Operations and maintenance services in support of ALMR shared infrastructure equipment have been provided by stakeholder staff and through service contracts. It is anticipated that once ALMR is fully deployed and/or the Operations Management Office (OMO) is fully staffed that all operations and maintenance services in support of shared infrastructure sites and equipment will be provided either by OMO staff or through service contracts managed by OMO staff. Operations and maintenance services provided in support of the ALMR shared infrastructure equipment are classified as ALMR Shared Infrastructure components and ***included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Due to the critical nature of the services supported by ALMR, the ALMR User Council has requested that ALMR be operated and maintained at the highest level of maintenance, as described in the draft SLA. The highest level of maintenance (Level A) supports a system that is operational at least 99.999% of the time. Level A requires responses to requests for remote telephone technical support within 1 hour from receipt of notification; requests for on-site technical response within 4 hours from receipt of notification; and on-site technical repair within 4 hours from technical response. In general, Level A is the maintenance level that is currently being provided under the existing maintenance contract. For the TCO, the costs of all operation and maintenance services associated with the ALMR Shared Infrastructure have been developed at a level that supports ALMR at Level A.

Master and Radio Frequency Site Equipment

ALMR is a multiple-zone design system comprised of master sites and radio frequency (RF) sites. Currently ALMR is **comprised of three** zones. All sites located south of the Denali Highway are assigned to Zone 1. All sites located north of the Denali Highway are in Zone 2. Zone 3 will be the Municipality of Anchorage AWARN System. Each zone has a Master Site and a number of radio frequency (RF) sites. The Master Site for Zone 1 is located in Anchorage at Tudor Road. The Master Site for Zone 2 is located in Fairbanks on Fort Wainwright at Birch Hill. The Master Site for Zone 3 will be connected to the ALMR Master Zone Controller at Tudor Road allowing the two systems to interoperate with each other.

- Master Site Equipment - The Tudor Road Master Site for Zone 1 serves as a core network center for the entire SmartZone system. Data packets from the various ALMR sites are

routed through, and processed from, this network center. The user configuration server for the ALMR System is located at the Zone 1 Master Site. The Tudor Road site is interconnected to the Zone 2 Master Site at Birch Hill via multiple T1 circuits originating and terminating into WAN switches at each end. The Birch Hill SmartZone Master Site as Zone 2 serves as a core network center for Zone 2. Data packets from the various System sites are routed through and processed from this network center. Zone 3 is the Municipality of Anchorage AWARN System which will be a trunked 700 MHz land mobile radio system**.**

Equipment associated with each Master Site includes a primary and a redundant Zone Controller, the main Ethernet switch, core, gateway and exit routers, and zone database, system level and network security servers. Both Master Sites also include a console subsystem consisting of a Motorola Gold Elite Gateway, an ambassador electronics bank, and a central electronics bank with associated base interface modules. Master Site equipment is classified as ALMR Shared Infrastructure components. Costs of and associated with Master Site equipment ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Radio Frequency (RF) Site Equipment - The RF site equipment includes a quantity of Motorola Quantar IntelliSite Repeaters, redundant site controllers, redundant Ethernet switches and routers to interface the data packets to the SmartZone Master Sites. The RF equipment includes the associated multi-coupler, combiner, antenna system, Motorola System Control and Data fault alarm system and 48 VDC power supplies. Sites also include bi-directional amplifier systems that support wide-area connectivity and the associated RF antenna systems consisting of transmit and receive antennas, coaxial cables, lightning arrestors, grounding kits and mounting brackets/other fasteners.

    - Shared Infrastructure – The RF equipment located at sites supporting all ALMR users are classified as ALMR Shared Infrastructure components. Costs of and associated with the equipment located at these sites ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

    - User Infrastructure – RF equipment located at sites that are only for the benefit of a single user entity or specific group of user entities are classified as User Infrastructure components. Costs of and associated with these RF Sites ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Subsystem Equipment

Subsystem equipment connects directly to ALMR or enhances ALMR functionality. These subsystems include dispatch consoles, key management facilities, network management terminals, telephone interconnect systems, logging recorders, data servers and bi-directional amplifiers.

- Console System – Remote or local dispatch consoles and other equipment required to connect the console to the ALMR Shared Infrastructure (Console System). Console system equipment is classified as a User Infrastructure component. Costs of and associated with console systems ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Key Management Facility (KMF) – KMF systems distributes keys over the air to enabled and authorized subscriber equipment. KMF equipment includes a KMF application server, database server, and client**.** KMF system equipment is classified as a User Infrastructure component. Costs of and associate with KMF systems ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Network Management Terminals (NMT) – NMTs are consoles that allow network system and user managers and technicians to connect to the ALMR. NMTs are connected to the Zone Controllers and used by network system managers and technicians to manage and trouble shoot the overall ALMR System. NMTs are used by user system managers and technologists to manage the radio fleet, units and configurations of their entity.

    - Shared Infrastructure – NMTs connected to the zone controllers are classified as ALMR Shared Infrastructure components. Costs of and associated with these NMTS ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

    - User Infrastructure – NMTS used by user system managers and technicians are classified as User Infrastructure components. Costs of and associated with these NMTs ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Telephone Interconnect (TI) – A TI system provides a means for users to connect through ALMR with the public switched telephone network (PSTN). A TI is an optional feature that enables users to blend ALMR and PSTN into a single capability. TI system equipment is classified as a User Infrastructure component. Costs of and associated with TI systems ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Logging Recorder – Logging recorders are directly associated with the console system at a particular dispatch location and are installed by user entities to record conversations for response and liability purposes. A logging recorder is an optional feature that may be selected by a user and only benefits a stakeholder's entity. A logging recorder is classified as a User Infrastructure component. Costs of and associated with logging recorders ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Data Server – Data servers include all equipment associated with the integrated voice and data servers that can provide data over the internet protocol network. A data server is an optional feature that maybe selected by a user and only benefits a stakeholder's entity. A data server is classified as a User Infrastructure component. Costs of and associated with data servers ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Bi-Directional Amplifier (BDA) – BDAs enable ALMR coverage to be extended into or within a particular facility or tunnel by repeating transmissions to and from an available donor radio frequency site. BDAs are located at ALMR Shared Infrastructure sites and user sites.

    - Shared Infrastructure – BDAs connected to ALMR Shared Infrastructure sites, such as Whittier Tunnel, are classified as ALMR Shared Infrastructure components. Costs of and associated with these BDAs ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

    - User Infrastructure – BDAs connected to user sites are classified as User Infrastructure components. Costs of and associated with these BDAs ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Motobridge Gateway System

A Motorola Motobridge Gateway System has been installed that provides connectivity to ALMR talk groups, but it is separate from the ALMR network. It is on a State of Alaska local area network (LAN) with connectivity through SATS. The Motobridge Gateway System provides interoperability between various communications networks with a radio-over-IP system. Central management of the Motobridge Gateway System is provided by dual-redundant management servers located in Fairbanks and Anchorage. Other components consist of dispatch positions with Work Station Gateway Units and computer consoles for linking conventional and trunked two-way radio systems together, and Radio Gateway Units that physically tie the dissimilar radio resources to the network.

- Operations Management Center (OMC) Server - OMC Servers are the main management servers in the ALMR System and central repositories where all ALMR System users and resources (i.e. administrators, dispatchers and radios) are registered, and where system-wide information (i.e. active patches and conferences, security parameters, etc.) is stored. The primary OMC Server is located in Zone 1 at the Anchorage Emergency Operations Center (EOC) and the secondary OMC Server is located in Zone 2 at the Fairbanks EOC. The OMC Servers are classified as ALMR Shared Infrastructure components. Costs of and associated with the OMC Servers ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Administrator Control Panel (ACP) - An ACP allows an administrator, located anywhere in the System, to perform management activities for the ALMR System. An ACP runs on the Microsoft XP operating system and is located with each of the OMC servers. ACPs are classified as ALMR Shared Infrastructure components. Costs of and associated with ACPs ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Session Initiation Protocol (SIP) Proxy Server – A SIP Proxy Server is a signaling server utilized to establish talk paths (calls) across the ALMR System. A SIP Proxy Server complies with international standards for multimedia call routing and telephony services on the Internet; and interacts with the gateway units in the ALMR System, which implements the SIP user-agent portion of the standard. SIP Proxy Servers are classified as ALMR Shared Infrastructure components. Costs of and associated with the SIP Proxy Servers ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Radio Gateway Unit (RGU) – A RGU is used to connect the radio equipment of a single user entity or specific group of user entities to ALMR. Although a RGU may be used to connect the radio equipment of multiple users to ALMR, RGUs do not benefit all ALMR users. Therefore, RGUs are classified as User Infrastructure components. Costs of and associated with RGUs ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Work Station Gateway Unit (WSGU) – A WSGU interfaces with a Dispatch Console PC to provide the Motobridge dispatch position used by the public safety interoperability dispatcher. WSGUs are classified as User Infrastructure components. Costs of and associated with WSGUs ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Dispatch Console PC – A Dispatch Console PC enables a dispatcher to activate the WSGU, which allows control over a large number of connected remote radios, intercom connections, audio conferences, and phone calls. Dispatch Console PCs are classified as User Infrastructure components. Costs of and associated with Dispatch Console PCs ***are***

not included in developing the total cost of ownership of the ALMR Shared Infrastructure.

Site Implementation

ALMR shared infrastructure components are located at sites owned and maintained by the stakeholders. Availability of adequate and properly maintained sites and support equipment are required for ALMR to function properly. In addition to shelter related equipment, supporting site equipment includes transmission towers, power generating equipment, and grounding. Costs associated with improvements and enhancements made to bring sites into compliance with ALMR site support specifications ***are included*** in developing the total cost of ownership of the ALMR Shared Infrastructure. Costs associated with any new sites specifically developed to accommodate ALMR shared infrastructure components ***are also included*** in developing the total cost of ownership of the ALMR Shared Infrastructure. Site components include:

- Physical Area - Includes grading, plowing and graveling access roads, brushing, mowing and fencing around the area where the shelter and tower are located.

- Shelters - Includes all stand-alone shelters, prefabricated and stick-built, used for housing ALMR and associated communication equipment. For areas within existing buildings, this also includes required improvements to the rooms where the ALMR System and associated communications equipment is housed. Equipment in the shelters include racks, internal wiring, external ice bridges, foundations and leveling, exterior lighting, air conditioners, louvers, fans and door locks.

- Towers - Includes all components of the tower including the foundation, frame and ladders, painting, guys (as applicable), beacons, foundations and anchors.

- Power - Includes the distribution panel for external power, inverters, battery plants, battery chargers and generators. Also includes are generator fuel tanks, generator enclosures, exhaust piping, backup generators, and uninterrupted power source systems associated with the zone controllers.

- Grounding – Includes all activities required to bond together of all site equipment to form a single common earth ground electrode system as outlined in the Motorola "R56 - Standards and Guidelines for Communication Systems." This includes maintaining all internal and external grounding in working order through the life of the ALMR System.

Site Maintenance

ALMR shared infrastructure components are located at sites owned and maintained by the stakeholders. Although, availability of adequate and properly maintained sites and support equipment is required for ALMR to function properly, site grounds, structures, power, and

support equipment would exist and need to be maintained regardless of whether ALMR was located at a site. Per an agreement among the Stakeholders, costs associated with maintaining the site grounds, structures, power, and support equipment will be borne by the owner of each site. Therefore, costs associated with maintaining site grounds, structures, power and support equipment ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Transportable/Deployable Systems

The ALMR includes two transportable/deployable (T/D) systems. T/D systems are designed to function as stand-alone systems or to connect with and be an integral part of the ALMR System. Each T/D system consists of multiple modules that can be transported via tractor-trailer, C-130/similar-sized cargo plane or Chinook/similar-sized helicopter. T/D System 1 includes all modules. T/D System 2 does not include Module 4**.** The T/D Systems are maintained in a ready state that enables deployment within 24 hours. T/D System modules include:

- Module 1: Communication Shelter - The communications shelter module is approximately 9 feet wide by 16 feet long by 9 feet high. It contains a five-channel RF site, conventional UHF and VHF radios, marine band and air-to-ground radios, a Motobridge RGU, satellite control interface, an unlicensed 5.8 GHz microwave radio, a CEB and a 48 VDC battery plant for 8 hours run time.

- Module 2: Dispatch Shelter - The dispatch shelter is approximately 9 feet wide by 16 feet long by 9 feet high. It contains one Motorola Gold Elite console position and a Motobridge OMC, ACP, SIP server, WSGU and dispatch position.

- Module 3: Tower/Power Skid - The tower/power skid is approximately 9 feet wide by 20 feet long and contains a 35KW self-contained diesel generator and integral fuel tank for three continuous days of operation at half load. It also contains a 50-foot powered crank-up tower. It has permanently mounted antennas for the RF site and two conventional frequencies.

- Module 4: C-Band Satellite Earth Station Antenna Skid - A C-Band transportable earth station is provided with an Andrew 4.5 Meter Tri-Fold antenna mounted on a trailer/skid approximately 9 feet wide by 20 feet long.

- Module 5: MESH Network Skid - The MESH Shelter module is approximately 9 feet wide by 16 feet long by 9 feet high. It contains MESH Network equipment which allows images to be passed along within a 1/2 square mile area back to a central location. It also has the equipment to provide telephone services and wireless internet within the service area.

The T/D Systems have been procured and are currently being maintained by USDOD. The Alaska National Guard has been requested to assume responsibility for the Systems and to maintain them in a ready state enabling deployment within 24 hours, but had not accepted this responsibility at the time the TCO was developed. Although the T/D systems are potentially available to any user, the T/D Systems are not classified as ALMR Shared Infrastructure components for this TCO study.

Per an agreement among the Stakeholders, costs of procuring and maintaining the systems will be borne by USDOD or the Alaska National Guard should they accept responsibility for the T/D Systems. Therefore, costs of and associated with the T/D systems and maintaining them in a ready deployment state ***are not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

Communications Transport Network

All voice and data signals that are carried on ALMR are transported to the Master Site zone controllers through SATS. SATS is operated and maintained by the State of Alaska Department of Administration (ADOA). SATS is comprised of multiple methods of network connectivity to include microwave, commercially leased T1s and local fiber networks. In some locations, the connectivity links are encrypted utilizing bulk encryption equipment. The ALMR channel banks provide a connectivity gateway from the System central controllers to the remote RF sites. The channel banks provide individual Channel Service Units (CSU) to each remote site location and link them to the Master Site zone controllers. In addition to SATS, commercial circuits and user provided circuits are utilized by the ALMR shared infrastructure and users.

Due to the critical nature of the services supported by ALMR, the ALMR User Council has requested that the ALMR be operated and maintained at the highest level of maintenance, as described in the draft SLA. The highest level of maintenance (Level A) supports a system that is operational at least 99.999% of the time. Level A requires responses to requests for remote telephone technical support within 1 hour from receipt of notification; requests for on-site technical response within 4 hours from receipt of notification; and on-site technical repair within 4 hours from technical response. Since without SATS, ALMR usage is impaired, the costs of SATS, commercial, and user provided circuits have been developed at a level that supports ALMR at Level A.

- SATS Circuits – Costs of SATS circuits are viewed the same as the cost of circuits provided by a commercial service provider, such as AT&T and GCI.
    - Shared Infrastructure – Costs of SATS circuits used and benefiting the ALMR shared infrastructure are classified as ALMR Shared Infrastructure costs and ***included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

  - User Infrastructure – Costs of SATS circuits benefiting specific users (such as to connect to a dispatch site) are classified as user costs and ***not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- Commercial Leased Circuits – Costs of commercial leased circuits.

  - Shared Infrastructure – Costs of commercial leased circuits used and benefiting the ALMR shared infrastructure are classified as ALMR Shared Infrastructure costs and ***included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

  - User Infrastructure – Costs of commercial leased circuits benefiting specific users (such as to connect to a dispatch site) are classified as user costs and ***not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

- User Provided Circuits – Costs of user provided circuits.

  - Shared Infrastructure – Costs of user provided circuits used and benefiting the ALMR shared infrastructure are classified as ALMR Shared Infrastructure costs and ***included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

  - User Infrastructure – Costs of user provided circuits benefiting specific users (such as to connect to a dispatch site) are classified as user costs and ***not included*** in developing the total cost of ownership of the ALMR Shared Infrastructure.

This concludes the subsection on the identification of ALMR components and their status as an ALMR shared infrastructure component or a user component.

Cost Components

Since its inception, costs have been incurred by the stakeholders in the design, construction, and implementation of ALMR (implementation costs). In addition, there are and will be costs associated with the management, operation and maintenance of the ALMR (O&M) through its anticipated lifecycle of eighteen years. Costs associated with the implementation, management, and O&M of the ALMR Shared Infrastructure have been and are to be shared by the principal stakeholders.

In this Section of the TCO, cost components that are included in developing the total cost of ownership of the ALMR Shared Infrastructure are identified for each shared infrastructure component. The following major cost categories are utilized to describe the costs utilized in developing the total cost of the ALMR Shared Infrastructure components:

- Personnel – Includes salaries and wages, benefits, and other employee related costs of stakeholder staff.

- Travel - Transportation, lodging, per diem, auto rental, parking, and other travel related costs.

- Contract Services – Costs of professional, technical, maintenance and other services acquired through contracts and purchase orders with non-governmental entities.

- Supplies – Costs of office, data processing, custodial, maintenance and other types of supplies utilized in day to day operations.

- Other Operating – Equipment and facility rental, postage, printing, shipping and other operating costs incurred in the support of day to day operations.

- Equipment – Costs of equipment and associated warranties.

- Indirect – Administrative and support costs incurred by a stakeholder in support of staff and resources. To be included, these costs must be determined in accordance with applicable federal cost principals and procedures as presented in 2 CFR Part 225 "Cost Principles for State, Local and Indian Tribal Governments (OMB Circular A-87)". Usually these costs will be determined utilizing an indirect cost rate approved by the stakeholder's cognizant Federal agency.

- Stakeholder Billed Services – Costs billed for services, such as SATS by ADOA, provided by stakeholders must be determined in accordance with applicable federal cost principals and procedures as presented in 2 CFR Part 225 "Cost Principles for State, Local and Indian Tribal Governments (OMB Circular A-87)". The methodology utilized by ADOA to determine rates for billed services, including SATS, are annually reviewed and approved by ADOA's cognizant federal agency, the U.S. Department of Health and Human Resources.

ALMR Executive Council

The Executive Council is classified as an ALMR Shared Infrastructure component. The following costs of and associated with the ALMR Executive Council **are included** in developing the TCO:

- Personnel costs of Executive Council designated co-chairs or their representatives to prepare for and attend Executive Council meetings and functions.

- Personnel costs of stakeholder staff requested to attend meetings by the Executive Council to make presentations and respond to Executive Council inquiries.

- Personnel costs incurred by stakeholder staff in the coordination, scheduling, and holding of Executive Council meetings.

- Travel costs incurred by and/or for ALMR Executive Council designated co-chairs or their representatives to attend ALMR Executive Council meetings and functions.

- Travel costs incurred by and/or for stakeholder staff requested to attend meetings by the Executive Council to make presentations and respond to Executive Council inquiries.

- Supplies and other operating costs incurred in direct support of Executive Council meetings.

- Indirect costs incurred in support of Executive Council members and stakeholder staff during their performance of activities related to Executive Council meetings.

ALMR User Council

The User Council is classified as an ALMR Shared Infrastructure component. The following costs of and associated with the ALMR User Council ***are included*** in developing the TCO:

- Personnel costs of User Council designated members or their representatives to prepare for and attend Executive and User Council meetings and functions.

- Personnel costs of stakeholder staff requested to attend meetings by the User Council to make presentations and respond to User Council inquiries.

- Personnel costs incurred by stakeholder staff in the coordination, scheduling, and holding of User Council meetings.

- Travel costs incurred by and/or for ALMR User Council designated members or their representatives to attend Executive and User Council meetings and functions.

- Travel related costs incurred by and/or for stakeholder staff requested to attend meetings by the User Council to make presentations and respond to User Council inquiries.

- Supplies and other operating costs incurred in direct support of User Council meetings.

- Indirect costs associated with services provided by stakeholder staff in support of Executive and User Council meetings.

- Indirect costs incurred in support of User Council members and stakeholder staff during their performance of activities related to Executive and User Council meetings.

Joint Project Management Team

The Joint Project Management Team (JPMT) is classified as an ALMR Shared Infrastructure component. The following costs of and associated with the JPMT ***are included*** in developing the TCO:

- Contract or personnel costs incurred by and/or for stakeholder staff assigned to and/or benefiting JPMT activities.
- Travel related costs incurred by and/or for stakeholder staff in the performance of JPMT activities.
- Contract services utilized by JPMT in the performance of JPMT activities.
- Supplies and other operating costs incurred in direct support of JPMT activities.
- Indirect costs incurred in support of stakeholder staff.

Stakeholder Project Management

Activities of the stakeholder project managers benefiting all stakeholders are classified as ALMR Shared Infrastructure components. The following costs of and associated with these activities ***are included*** in developing the TCO:

- Contact or personnel costs incurred by stakeholder project managers.
- Travel related costs incurred by and/or for stakeholder project managers.
- Supplies and other operating costs incurred in direct support of activities benefiting the ALMR shared infrastructure.
- Indirect costs incurred in support of stakeholder staff.

Stakeholder Technical Support Services

Technical support provided by stakeholder staff benefiting all stakeholders is classified as an ALMR Shared Infrastructure component. The following costs of and associated with this support ***are included*** in developing the TCO.

- Contract or personnel costs incurred by stakeholder staff in the provision of technical support.
- Travel related costs incurred by and/or for stakeholder staff in the provision of technical support.

- Supplies and other operating costs incurred in direct support of stakeholder staff in the provision of technical support.

- Indirect costs incurred in support of stakeholder staff.

Administrative and Management Services

Administrative and management services provided in support of the ALMR shared infrastructure operations by stakeholders and through service contracts are classified as an ALMR Shared Infrastructure component. The following costs of and associated with these services ***are included*** in developing the TCO.

- Contract or personnel costs incurred by stakeholder staff in the provision of administrative and management services.

- Travel costs incurred by stakeholder staff in the provision of administrative and management services.

- Travel related costs incurred by and/or for contract staff in the provision of administrative and management services.

- Contract administrative and management services.

- Supplies and other operating costs incurred in direct support of stakeholder staff in the provision of administrative and management services.

- Indirect costs incurred in support of stakeholder staff.

System Software

The system software is classified as an ALMR Shared Infrastructure component. The following costs of and associated with the system software ***are included*** in developing the TCO.

- Procurement – Costs associated with the selection and procurement of the initial version of the software.

    - Stakeholders – Costs associated with stakeholder staff assisting in the selection and procurement process. Costs include personnel, travel, supplies, other operating, and indirect costs.

    - Contract Services – Costs associated with contract personnel assisting in the selection and procurement process. Costs include payments for contract personnel, travel, supplies, other operating, and indirect costs.

- Initial Software – Payments to the software vendor for the initial software version.

- Software Upgrades – Payments to the software vendor for enhancements and upgrades to the software.

- Annual Software License – Payments to the software vendor for the annual use and support of the software.

- Implementation and Maintenance – Costs associated with the implementation and maintenance of the initial software version and subsequent upgrade versions.

    - Stakeholders – Costs associated with stakeholder staff assisting in the implementation and maintenance of the initial software and software upgrades. Costs include personnel, travel, supplies, other operating, and indirect costs.

    - Contract Services – Costs associated with contract personnel assisting in the implementation and maintenance of the initial software and software upgrades. Costs include payments for contract personnel, travel, supplies, other operating, and indirect costs.

- Indirect costs incurred in support of stakeholder staff.

Equipment Operation and Maintenance Services

Equipment operation and maintenance (O&M) services provided in support of the ALMR shared infrastructure equipment are classified as ALMR Shared Infrastructure components. The costs of all operation and maintenance services associated with the ALMR Shared Infrastructure have been developed at a level that supports ALMR operations at SLA Level A (99.999%). The following costs of and associated with equipment O&M services ***are included*** in developing the TCO.

- Contract or personnel services costs incurred by stakeholder staff in the management of and/or the provision of O&M services.

- Travel costs incurred by stakeholder staff in the management of and/or the provision of O&M services.

- Travel related costs incurred by and/or for contract personnel in the management of and/or the provision of O&M services.

- Contract O&M services benefiting the ALMR shared infrastructure.

- Supplies, equipment, and other operating costs incurred by stakeholders and through service contracts in the provision of O&M services.

- Indirect costs incurred in support of stakeholder staff.

Master and Radio Frequency Site Equipment

- Master Site Equipment - Master Site equipment is classified as ALMR Shared Infrastructure components. The following costs of and associated with Master Site equipment ***are included*** in developing the TCO.
    - Procurement – Costs associated with the procurement of the initial equipment and replacement of the equipment.
        - Stakeholders – Costs associated with stakeholder staff assisting in the procurement process. Costs include personnel, travel, supplies, other operating, and indirect costs.
        - Contract Services – Costs associated with contract personnel assisting in the procurement process. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
    - Equipment – Costs of the initial equipment and warranties.
    - Installation and Maintenance – Costs associated with the installation and maintenance of the equipment.
        - Stakeholders – Costs associated with stakeholder staff assisting in the installation and maintenance of the equipment. Costs include personnel, travel, supplies, other operating, and indirect costs.
        - Contract Services – Costs associated with contract personnel assisting in the installation and maintenance of the equipment. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
    - Indirect costs incurred in support of stakeholder staff.
- Radio Frequency (RF) Site Equipment - The RF equipment located at RF sites supporting all ALMR users are classified as an ALMR Shared Infrastructure component. The following costs of and associated with the equipment located at these sites ***are included*** in developing the TCO.
    - Procurement – Costs associated with the procurement of the initial equipment and replacement of the equipment.
        - Stakeholders – Costs associated with stakeholder staff assisting in the procurement process. Costs include personnel, travel, supplies, other operating, and indirect costs.

        - Contract Services – Costs associated with contract personnel assisting in the procurement process. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.

    - Equipment – Costs of the initial equipment and warranties.

    - Installation and Maintenance – Costs associated with the installation and maintenance of the equipment.

        - Stakeholders – Costs associated with stakeholder staff assisting in the installation and maintenance of the equipment. Costs include personnel, travel, supplies, other operating, and indirect costs.

        - Contract Services – Costs associated with contract personnel assisting in the installation and maintenance of the equipment. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.

    - Indirect costs incurred in support of stakeholder staff.

Subsystem Equipment

- Network Management Terminals (NMT) – NMTs connected to the zone controllers are classified as ALMR Shared Infrastructure components. The following costs of and associated with these NMTS **are included** in developing the TCO.

    - Procurement – Costs associated with the procurement of the initial equipment and replacement of the equipment.

        - Stakeholders – Costs associated with stakeholder staff assisting in the procurement process. Costs include personnel, travel, supplies, other operating, and indirect costs.

        - Contract Services – Costs associated with contract personnel assisting in the procurement process. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.

    - Equipment – Costs of the initial equipment and warranties.

    - Installation and Maintenance – Costs associated with the installation and maintenance of the equipment.

        - Stakeholders – Costs associated with stakeholder staff assisting in the installation and maintenance of the equipment. Costs include personnel, travel, supplies, other operating, and indirect costs.

        - Contract Services – Costs associated with contract personnel assisting in the installation and maintenance of the equipment. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.

    - Indirect costs incurred in support of stakeholder staff.

- Bi-Directional Amplifier (BDA) – BDAs connected to ALMR Shared Infrastructure sites are classified as ALMR Shared Infrastructure components. The following costs of and associated with these BDAs **are included** in developing the TCO.

    - Procurement – Costs associated with the procurement of the initial equipment and replacement of the equipment.

        - Stakeholders – Costs associated with stakeholder staff assisting in the procurement process. Costs include personnel, travel, supplies, other operating, and indirect costs.

        - Contract Services – Costs associated with contract personnel assisting in the procurement process. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.

    - Equipment – Costs of the initial equipment and warranties.

    - Installation and Maintenance – Costs associated with the installation and maintenance of the equipment.

        - Stakeholders – Costs associated with stakeholder staff assisting in the installation and maintenance of the equipment. Costs include personnel, travel, supplies, other operating, and indirect costs.

        - Contract Services – Costs associated with contract personnel assisting in the installation and maintenance of the equipment. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.

    - Indirect costs incurred in support of stakeholder staff.

Motobridge Gateway System

- Operations Management Center (OMC) Server - OMC Servers are classified as ALMR Shared Infrastructure components. The following costs of and associated with the OMC Servers ***are included*** in developing the TCO.

- Procurement – Costs associated with the procurement of the initial equipment and replacement of the equipment.
  - Stakeholders – Costs associated with stakeholder staff assisting in the procurement process. Costs include personnel, travel, supplies, other operating, and indirect costs.
  - Contract Services – Costs associated with contract personnel assisting in the procurement process. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
- Equipment – Costs of the initial equipment and warranties.
- Installation and Maintenance – Costs associated with the installation and maintenance of the equipment.
  - Stakeholders – Costs associated with stakeholder staff assisting in the installation and maintenance of the equipment. Costs include personnel, travel, supplies, other operating, and indirect costs.
  - Contract Services – Costs associated with contract personnel assisting in the installation and maintenance of the equipment. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
- Indirect costs incurred in support of stakeholder staff.

- Administrator Control Panel (ACP) - ACPs are classified as ALMR Shared Infrastructure components. The following costs of and associated with ACPs ***are included*** in developing the TCO.
  - Procurement – Costs associated with the procurement of the initial equipment and replacement of the equipment.
    - Stakeholders – Costs associated with stakeholder staff assisting in the procurement process. Costs include personnel, travel, supplies, other operating, and indirect costs.
    - Contract Services – Costs associated with contract personnel assisting in the procurement process. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
  - Equipment – Costs of the initial equipment and warranties.

- Installation and Maintenance – Costs associated with the installation and maintenance of the equipment.
  - Stakeholders – Costs associated with stakeholder staff assisting in the installation and maintenance of the equipment. Costs include personnel, travel, supplies, other operating, and indirect costs.
  - Contract Services – Costs associated with contract personnel assisting in the installation and maintenance of the equipment. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
- Indirect costs incurred in support of stakeholder staff.

- Session Initiation Protocol (SIP) Proxy Server – SIP Proxy Servers are classified as ALMR Shared Infrastructure components. The following costs of and associated with SIP Proxy Servers ***are included*** in developing the TCO.
  - Procurement – Costs associated with the procurement of the initial equipment and replacement of the equipment.
    - Stakeholders – Costs associated with stakeholder staff assisting in the procurement process. Costs include personnel, travel, supplies, other operating, and indirect costs.
    - Contract Services – Costs associated with contract personnel assisting in the procurement process. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
  - Equipment – Costs of the initial equipment and warranties.
  - Installation and Maintenance – Costs associated with the installation and maintenance of the equipment.
    - Stakeholders – Costs associated with stakeholder staff assisting in the installation and maintenance of the equipment. Costs include personnel, travel, supplies, other operating, and indirect costs.
    - Contract Services – Costs associated with contract personnel assisting in the installation and maintenance of the equipment. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
  - Indirect costs incurred in support of stakeholder staff.

Site Implementation

- Although sites and support equipment are considered an ALMR shared infrastructure component, only costs associated with improvements and enhancements made to bring existing sites into compliance with ALMR site support specifications and costs of any new sites specifically developed to accommodate ALMR ***are included*** in developing the TCO of the ALMR Shared Infrastructure. Costs associated with maintaining the site grounds, structures, power, and support equipment are to be borne by the owner of each site, and these costs ***are not included*** in developing the TCO of the ALMR Shared Infrastructure. The following costs of and associated with the implementation of each site ***are included*** in developing the TCO.
    - Procurement – Costs associated with the procurement of enhancements, improvements and equipment required to bring sits into compliance with ALMR site specifications.
        - Stakeholders – Costs associated with stakeholder staff assisting in the procurement process. Costs include personnel, travel, supplies, other operating, and indirect costs.
        - Contract Services – Costs associated with contract personnel assisting in the procurement process. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
    - Equipment – Costs site enhancements, improvements and equipment.
    - Installation – Costs associated with the improvements and enhancements of sites, and the installation of the equipment.
        - Stakeholders – Costs associated with stakeholder staff assisting with improvements and enhancements, and the installation of equipment. Costs include personnel, travel, supplies, other operating, and indirect costs.
        - Contract Services – Costs associated with contract personnel assisting with the improvements and enhancements, and the installation of equipment. Costs include payments for contract services, personnel, travel, supplies, other operating, and indirect costs.
        - Indirect costs incurred in support of stakeholder staff.

Communications Transport Network

- SATS Circuits – Costs of SATS circuits used and benefiting the ALMR shared infrastructure are classified as ALMR Shared Infrastructure costs. Since without SATS,

ALMR usage is impaired, the costs of SATS circuits have been developed at a level that supports ALMR operations at SLA Level A (99.999%). Costs of SATS circuits are viewed the same as the cost of circuits provided by a commercial service provider, such as AT&T or GCI. Costs billed for SATS circuits are determined based either on Alaska Regulatory Commission approved rates or in accordance with applicable federal cost principals and procedures. ADOA billed services costs for ALMR usage of SATS circuits ***are included*** in developing the TCO. Costs billed for SATS circuits are determined by ADOA in accordance with applicable federal cost principals and procedures as presented in 2 CFR Part 225 "Cost Principles for State, Local and Indian Tribal Governments (OMB Circular A-87)". The methodology utilized by ADOA to determine rates for SATS circuits are annually reviewed and approved by ADOA's cognizant federal agency, the U.S. Department of Health and Human Resources.

- Commercial Leased Circuits – Costs of commercial leased circuits used and benefiting the ALMR shared infrastructure are classified as ALMR Shared Infrastructure costs. The billed costs of commercial leased circuits ***are included*** in developing the TCO.

- User Provided Circuits – Costs of user provided circuits used and benefiting the ALMR shared infrastructure are classified as ALMR Shared Infrastructure costs. Costs billed for circuits are determined based on either Alaska Regulatory Commission approved rates or in accordance with applicable federal cost principles and procedures.

This concludes the Cost Component Section.

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)

NETWORK ENTERPRISE SYSTEM SHARED INFRASTRUCTURE

TOTAL COST OF OWNESHIP STUDY (TCO)

SHARED INFRASTRUCTURE COST COMPONENTS

				TYPE OF COSTS						
	SECTION	SHARED INFRASTR.				CONTRACT		OTHER	EQUIPMENT	
COMPONENTS	PAGES	YES	NO	PERSONNEL	TRAVEL	SERVICES	SUPPLIES	OPER.	SOFTWARE	INDIRECT
Executive Council	1 & 15	X		X	X		X	X		X
User Council	1 & 16	X		X	X		X	X		X
Joint Project Management Team	2 & 17	X		X	X	X	X	X		X
Stakeholder Project Management										
Shared Infrastructure Activities	2 & 17	X		X	X	X	X	X		X
User Activities	2		X							
Stakeholder Technical Support										
Shared Infrastructure Activities	3 & 17	X		X	X	X	X	X		X
User Activities	3		X							
Admin. & Management Services										
General Management	3 & 18	X		X	X	X	X	X		X
Administrative Support	4 & 18	X		X	X	X	X	X		X
Fiscal Services	4 & 18	X		X	X	X	X	X		X
Annual Audit	4 & 18	X				X				
Wide Area System Mgmt	4 & 18	X		X	X	X	X	X		X
System Maint. & Tech. Support	4 & 18	X		X	X	X	X	X		X
Network Operations & Support	4 & 18	X		X	X	X	X	X		X
RF Spectrum Mgmt Support	5 & 18	X		X	X	X	X	X		X
RF Support	5 & 18	X		X	X	X	X	X		X
Security/Information Assurance	5 & 18	X		X	X	X	X	X		X
Training	5 & 18	X		X	X	X	X	X		X
Statewide Exercise Support	5 & 18	X		X	X	X	X	X		X
Administrative Software	6 & 18	X				X			X	
System Software										
Initial Version	6 & 18	X				X			X	
Updates	6 & 18	X				X			X	
Equip. Operations & Maint. Services	6 & 19	X		X	X	X	X	X		X

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)

NETWORK ENTERPRISE SYSTEM SHARED INFRASTRUCTURE

TOTAL COST OF OWNESHIP STUDY (TCO)

SHARED INFRASTRUCTURE COST COMPONENTS

				TYPE OF COSTS						
	SECTION	SHARED INFRASTR.				CONTRACT		OTHER	EQUIPMENT	
COMPONENTS	PAGES	YES	NO	PERSONNEL	TRAVEL	SERVICES	SUPPLIES	OPER.	SOFTWARE	INDIRECT
Master Site Equipment	6 & 20	X		X	X	X	X	X	X	X
RF Site Equipment										
Shared Infrastructure Sites	7 & 20	X		X	X	X	X	X	X	X
User Sites	7		X							
Console System	8		X							
Key Management Facility	8		X							
Network Management Terminals										
Zone Controller Connected NMT	8 & 21	X		X	X	X	X	X	X	X
User NMTs	8		X							
Telephone Interconnect	8		X							
Logging Recorder	9		X							
Data Server	9		X							
Bi-Directional Amplifer										
Shared Infrastructure Sites	9 & 22	X		X	X	X	X	X	X	X
User Sites	9		X							
Motobridge Gateway System										
Operations Management Center	10 & 22	X		X	X	X	X	X	X	X
Administrator Control Panel	10 & 23	X		X	X	X	X	X	X	X
SIP Proxy Server	10 & 24	X		X	X	X	X	X	X	X
Radio Gateway Unit	10		X							
Work Station Gateway Unit	10		X							
Dispatch Console PC	10		X							
Site Implementation										
Physical Area	11 & 25	X		X	X	X	X	X	X	X
Shelters	11 & 25	X		X	X	X	X	X	X	X
Towers	11 & 25	X		X	X	X	X	X	X	X
Power	11 & 25	X		X	X	X	X	X	X	X

ALASKA LAND MOBILE RADIO SYSTEM (ALMR)

NETWORK ENTERPRISE SYSTEM SHARED INFRASTRUCTURE

TOTAL COST OF OWNESHIP STUDY (TCO)

SHARED INFRASTRUCTURE COST COMPONENTS

				TYPE OF COSTS						
	SECTION	**SHARED INFRASTR.**				**CONTRACT**		**OTHER**	**EQUIPMENT**	
COMPONENTS	**PAGES**	**YES**	**NO**	**PERSONNEL**	**TRAVEL**	**SERVICES**	**SUPPLIES**	**OPER.**	**SOFTWARE**	**INDIRECT**
Grounding	11 & 25	X		X	X	X	X	X	X	X
Site Maintenance										
Physical Area	11		X							
Shelters	11		X							
Towers	11		X							
Power	11		X							
Grounding	11		X							
Transportable/Deployable System	12		X							
SATS Circuits										
Shared Infrastructure Circuits	13 & 25	X		X	X	X	X	X	X	X
User Circuits	14		X							
Comercial Leased Circuits										
Shared Infrastructure Circuits	14 & 26	X				X				
User Circuits	14		X							
User Provided Circuits										
Shared Infrastructure Circuits	14 & 26	X				X				
User Circuits	14		X							