



**REPORT OF
THE
STATE AUDITOR**

Public Safety Communications Trust Fund

**Financial and Performance Audit
January 2002**

**LEGISLATIVE AUDIT COMMITTEE
2002 MEMBERS**

Senator Jack Taylor
Chairman

Senator Ron Tupa
Vice-Chairman

Senator Norma Anderson
Representative Fran Coleman
Representative Glenn Scott
Senator Stephanie Takis
Representative Val Vigil
Representative Tambor Williams

Office of the State Auditor Staff

Joanne Hill
Acting State Auditor

Larry Gupton
Deputy State Auditor

Brenda Berlin
Heather Moritz
Legislative Auditors



STATE OF COLORADO

JOANNE HILL, CPA
Acting State Auditor

OFFICE OF THE STATE AUDITOR
(303) 866-2051
FAX(303)866-2060

Legislative Services Building
200 East 14th Avenue
Denver, Colorado 80203-2211

January 28, 2002

Members of the Legislative Audit Committee:

This report contains the results of a financial and performance audit of the Public Safety Communications Trust Fund (Fund). The audit was conducted pursuant to Section 24-30-908.5 (6), C.R.S., which authorizes the State Auditor to investigate the affairs of the Fund, severally examine the properties and records relating to the Fund, and prescribe accounting methods and procedures for rendering periodical reports in relation to disbursements and purchases made from the Fund. The report presents our findings, conclusions, and recommendations, and the responses of the Department of Personnel & Administration.

TABLE OF CONTENTS

	PAGE
EXECUTIVE SUMMARY	1
Recommendation Locator	5
DESCRIPTION OF THE PUBLIC SAFETY COMMUNICATIONS TRUST FUND ..	7
CHAPTER 1. PERFORMANCE ISSUES	13
Improve Efforts to Identify and Resolve Potential Problems	18
Develop a Fiscal Plan for the Life Cycle of the System	21
Improve Performance Measures	23
Seek Repeal of Unnecessary Reporting Requirements	25
Develop a Disaster Recovery Plan	26
Establish Formal Agreements With Participants	27
CHAPTER 2. FINANCIAL ISSUES	29
Develop an Inventory Policy for Digital Trunked Radio System Components	29
Improve Supervisory Review of Employee Travel Reimbursement Requests	30
Ensure Payments to Vendors Are Made in a Timely Manner	31
APPENDIX A. Digital Trunked Radio System Implementation Schedule	A-1
APPENDIX B. Digital Trunked Radio System Local Government Participants	B-1



JOANNE HILL, C.P.A.
Acting State Auditor

**Public Safety Communications Trust Fund
Financial and Performance Audit
January 2002**

Executive Summary

Authority, Purpose, and Scope

This financial and performance audit was conducted pursuant to Section 24-30-908.5 (6), C.R.S., which authorizes the State Auditor to investigate the affairs of the Public Safety Communications Trust Fund, severally examine the properties and records relating to the Fund, and prescribe accounting methods and procedures for rendering periodical reports in relation to disbursements and purchases made from the Fund. The audit was conducted in accordance with generally accepted governmental auditing standards. Our audit procedures included reviewing financial records and other documentation, interviewing Department staff, surveying digital trunked radio system users, analyzing data, and interviewing staff in other states. Audit work was conducted between July and December 2001. We gratefully acknowledge the assistance and cooperation of staff at the Department of Personnel & Administration in completing this audit. The following summary provides highlights of the comments, recommendations, and agency responses contained in the report.

Overview

The Public Safety Communications Trust Fund (Fund), which is administered by the Department of Personnel & Administration, was established pursuant to House Bill 98-1068 to purchase and maintain public safety radio communications systems for use by state agencies including, but not limited to, the Departments of Public Safety, Transportation, Natural Resources, and Corrections. Monies appropriated to the Fund come from state capital construction funds and are being used to pay for the installation of a new digital trunked radio system, which will replace the State's existing analog radio system. Replacement of the State's analog radio system was prompted by obsolescence issues, interoperability concerns, and coverage problems. Colorado's actions to replace its analog radio system parallel those being undertaken by other federal, state, and local public entities throughout the United States. All Colorado state agencies and any local government agency desiring to participate will share the Digital Trunked Radio System once it is completed.

For more information on this report, contact the Office of the State Auditor at (303) 866-2051.

SUMMARY

2

Public Safety Communications Trust Fund Financial and Performance Audit - January 2002

A users' group comprising state and local representatives developed the plan that is being used to govern system implementation. The plan includes six phases (see Appendix A for more information). The Department is currently working on Phase IV, which covers southeastern Colorado. Statewide installation of the Digital Trunked Radio System is expected to be completed by the end of Fiscal Year 2004 at a cost of nearly \$79 million. Department employees are performing some of the work associated with implementation, with assistance from the Department's contractor, Motorola, Inc.

Improve Efforts to Identify and Resolve Potential System Problems

Two primary goals of the Digital Trunked Radio System are to improve interoperability among federal, state, and local government agencies' public safety radio systems and to improve radio system coverage. During our audit we found some problems that may hinder the achievement of these goals. First, we noted that a number of local governments are not participating in the Digital Trunked Radio System. For example, local government agencies in only 7 of the 21 counties covered by Phases I through III of the Digital Trunked Radio System implementation plan are currently participating in the system. Maximizing local participation is important if statewide interoperability goals for the system are to be achieved. Second, we found that many respondents to our user surveys reported problems with system performance including dead zones, busy signals, site transfer/zone switching failures, loss of voice transmission capabilities, and inconsistent voice transmission volume. In addition, 15 of 36 respondents to our user survey (42 percent) indicated that planned radio system coverage (i.e., 95 percent from major roads and highways across Colorado) is insufficient to meet their needs. Concerns regarding participation, coverage, and other performance problems may not be alleviated until the Digital Trunked Radio System is fully implemented and the Department has demonstrated success in managing it. The Department can, however, take certain steps now to identify and resolve some issues in an effort to encourage local government participation and ensure the overall success of the system.

Develop a Fiscal Plan for the Life Cycle of the System

Funding strategies for radio communications systems are most effective when they encompass the system's entire life cycle. By considering costs on a life cycle basis, agencies are forced to develop a funding strategy that not only identifies fiscal resources for acquiring the system but also plans for acquiring the resources necessary to pay for operations, maintenance, and eventual system replacement. During the audit we found that the Department has not developed a formal fiscal plan for the life cycle of the Digital Trunked Radio System, which is estimated to be between 7 and 10 years for radios and 15 years for infrastructure. This is a concern because the equipment associated with the system includes approximately 10,800 radios,

numerous transmitter sites, and five dispatch centers. Each of these components has a differing life expectancy and replacement cost, some of which may be quite significant.

Improve Performance Measures

We reviewed the Department's budget documents to develop an understanding of the performance information being reported on the Digital Trunked Radio System. Performance information is important so that lawmakers, state managers, users, and the general public have a sound basis upon which to judge whether the State is implementing an effective and efficient radio system and, further, whether the system is correcting the problems it was intended to solve. We found that the Department needs to improve the performance measures established for the Digital Trunked Radio System. For example, existing performance information consists mostly of data related to achieving implementation-related milestones and, therefore, does not address ongoing system operations. Some aspects of ongoing system effectiveness and efficiency that could be measured include the number of service calls, time spent on service calls, number of busy signals, number of complaints, and percentage of customers satisfied. We also found that performance data are not always prominently displayed in budget documents, nor are they reported every year.

Seek Repeal of Unnecessary Statutory Reporting Requirements

State law governing the Public Safety Communications Trust Fund (Section 24-30-908.5(6), C.R.S.) requires the Executive Director of the Department of Personnel & Administration to "keep an accurate account of all activities related to the Fund including its receipts and expenditures and...annually, in the month of January, report such information to the State Auditor." Until we requested this information at the commencement of our audit, the Department had been out of compliance with this reporting requirement. We believe that this reporting requirement is unnecessary because detailed fund activity information remains available and immediately accessible on COFRS for at least five years. Requiring the Department to prepare a separate annual report of Fund activity is unnecessary and duplicative.

Develop Cost-Effective Inventory Procedures for Digital Trunked Radio System Components

When complete, the Digital Trunked Radio System will consist of a variety of equipment and infrastructure located throughout the State. State statutes (Section 24-17-102, C.R.S.) direct agencies to institute and maintain systems of internal accounting and administrative control that assure the proper safeguarding of state assets. State Fiscal Rules further require state agencies to ensure that all equipment owned by the State is properly accounted for when

SUMMARY

4

Public Safety Communications Trust Fund Financial and Performance Audit - January 2002

acquired, inventoried and safeguarded throughout its useful life, and properly accounted for at the time of disposal. Department staff told us that in order to comply with these directives, they perform periodic physical inventories of all components purchased for projects like the Digital Trunked Radio System. Once the Digital Trunked Radio System is completed, this would include inventorying low-cost parts such as cables, an approach that will be extremely time-consuming.

Improve Accuracy and Timeliness of Payments

We reviewed a sample of 25 payment vouchers for project expenses that occurred in either Fiscal Year 2000 or 2001 and found that the per diem rate (i.e., the amount paid to an employee for his or her daily meal allowance while traveling on state business) used on two of these vouchers was incorrect, resulting in an overpayment to the employee. We also found that 3 of the 25 payment vouchers were not processed in a timely manner. Specifically, these payments took between 11 and 54 calendar days longer than they should have according to state law and guidelines established by the State Fiscal Rules.

Our recommendations and the Department's responses are summarized in the recommendation locator, which begins on the following page.

RECOMMENDATION LOCATOR
Agency Addressed: Department of Personnel & Administration

Rec. No.	Page No.	Recommendation Summary	Agency Response	Implementation Date
1	19	Improve efforts to identify, secure, and communicate potential funding sources for Digital Trunked Radio System implementation costs.	Agree	November 1, 2002
2	20	Improve efforts to identify and resolve potential problems with the Digital Trunked Radio System.	Agree	June 30, 2002
3	22	Develop a fiscal plan that encompasses the life cycle of the Digital Trunked Radio System.	Partially Agree	November 1, 2002
4	24	Improve the performance measures associated with the Digital Trunked Radio System.	Agree	November 1, 2002
5	25	Work with the General Assembly to introduce legislation that eliminates unnecessary reporting requirements related to the Public Safety Communications Trust Fund.	Agree	May 2003
6	27	Work with users to develop, implement, test, and periodically update a comprehensive disaster recovery plan for the Digital Trunked Radio System.	Agree	December 31, 2002

RECOMMENDATION LOCATOR
Agency Addressed: Department of Personnel & Administration

Rec. No.	Page No.	Recommendation Summary	Agency Response	Implementation Date
7	28	Establish formal agreements with all local governments sharing Digital Trunked Radio System infrastructure and/or equipment sites.	Agree	December 31, 2002
8	30	Establish a cost-effective internal policy governing the periodic inventory of components for the Digital Trunked Radio System.	Agree	June 30, 2002
9	31	Improve supervisory review of employee travel reimbursement vouchers.	Agree	August 31, 2001
10	32	Ensure payments to vendors are processed in a timely manner.	Agree	September 7, 2001

Description of the Public Safety Communications Trust Fund

Background

The Public Safety Communications Trust Fund (Fund) was established pursuant to House Bill 98-1068 to purchase and maintain public safety radio communications systems for use by state agencies including, but not limited to, the Departments of Public Safety, Transportation, Natural Resources, and Corrections. Monies appropriated to the Fund come from state capital construction funds and are being used to pay for the installation of a new digital trunked radio system, which will replace the State's existing analog radio system. Replacement of the State's analog radio system was prompted by obsolescence issues, interoperability concerns, and coverage problems. Colorado's actions to replace its analog radio system parallel those being undertaken by other federal, state, and local public entities throughout the United States. All Colorado state agencies and any local government agency desiring to participate will share the Digital Trunked Radio System once it is completed.

The Fund is administered by the Department of Personnel & Administration. When authorizing distributions from the Fund, the Executive Director of the Department of Personnel & Administration is directed by statute to consider the following factors:

- C The need for achieving functional interoperability among local, state, and federal public safety radio communications systems by acquiring equipment that meets emerging technical standards for systems interoperability and open network architecture.
- C The needs of local government entities that have recently invested in new radio systems, particularly with regard to interoperability.
- C The promotion of an orderly transition from analog-based to digital-based radio systems.

Statutes also direct the Executive Director to keep an accurate account of all activities related to the Fund, including its receipts and expenditures, and report this information to the State Auditor each January. The State Auditor is further authorized to investigate the affairs of the Fund, severally examine the properties and records relating to the Fund, and prescribe accounting methods and procedures for rendering periodical reports in relation to disbursements and purchases made from the Fund.

Digital Trunked Radio System

Planning for a digital radio system first began in 1991 in response to a Long Bill footnote and a performance audit of the Division of Telecommunications that was conducted by the Office of the State Auditor. In the Long Bill footnote, the Joint Budget Committee requested that the Division of Telecommunications, the Information Management Commission, and the Colorado State Patrol develop a statewide telecommunications plan to replace and update their existing communications systems. Our 1991 audit of the Division found that the public safety radio system that existed then was “old, costly, and inefficient” and was “based on analog technology, which does not allow simultaneous interagency communications or sharing of resources.” These factors, as well as anticipated changes in the Federal Communications Commission’s rules aimed at making better use of the radio frequency spectrum, led to the changes now under way. Department staff indicate that improved public safety response times, reductions in interoperability problems, elimination of duplication of state-owned radio systems, and integrated data and voice transmissions over a single radio system network are some of the benefits that the State will realize with the implementation of the Digital Trunked Radio System.

A users' group comprising state and local representatives developed the plan that is being used to govern system implementation. The plan includes six phases, which are described in the following table (See Appendix A for a map of the implementation plan):

Digital Trunked Radio System Implementation Phases		
Phase	Fiscal Year	Counties Included
1	1999	Arapahoe, Denver, Douglas, Jefferson
2	2000	Adams, Boulder, Clear Creek, Gilpin, Broomfield
3	2001	Elbert, Weld, Larimer, Phillips, Morgan, Sedgwick, Yuma, Washington, Kit Carson, Cheyenne, Lincoln, Logan
4	2002	El Paso, Pueblo, Fremont, Teller, Custer, Otero, Las Animas, Huerfano, Baca, Prowers, Bent, Kiowa, Crowley, Chaffee
5	2003	Mesa, Garfield, Rio Blanco, Routt, Moffat, Grand, Jackson, Pitkin, Lake, Eagle, Park, Summit
6	2004	Costilla, Conejos, Saguache, Alamosa, Rio Grande, Mineral, Archuleta, San Juan, Hinsdale, Montrose, Gunnison, Ouray, La Plata, San Miguel, Dolores, Montezuma, Delta
Source: Department of Personnel & Administration.		

As the table shows, statewide installation of the Digital Trunked Radio System is expected to be completed by the end of Fiscal Year 2004 at a cost of nearly \$79 million. The Department is currently working on Phase IV, which covers southeastern Colorado. Department employees are performing some of the work associated with implementation, with assistance from the Department's contractor, Motorola, Inc. The Department reports that the total number of state FTE working on the project varies, depending upon the tasks being undertaken. On average, however, about 8 state FTE (engineers and field personnel) are involved with project design and implementation on an ongoing basis. The Department also reports that between 4 and 12 contract FTE (employees of Motorola, Inc.) work on the project, depending upon the tasks at hand.

Financial Overview

As stated previously, the total cost for the Digital Trunked Radio System is estimated to be approximately \$79 million. The following table shows project appropriations to date, as well as those anticipated for Fiscal Years 2003 and 2004:

Public Safety Communications Trust Fund Appropriations						
(In Millions)						
Fiscal Years 1999-2004						
FY 1999	FY 2000	FY 2001	FY 2002	FY 2003¹	FY 2004¹	TOTAL
\$3.3	\$13.9	\$12.9	\$17.7	\$15.6	\$15.6	\$79.0
Source: COFRS records and Department of Personnel & Administration.						
¹ Budget Request.						

Project expenditures to date by major spending category are shown in the following table. It should be noted that although \$3.3 million was appropriated for the project in Fiscal Year 1999, no expenditures occurred in that year.

Public Safety Communications Trust Fund				
Expenditures by Major Category				
Expenditure Category	Fiscal Year 2000	Fiscal Year 2001	Fiscal Year 2002¹	Total
Capitalized Equipment ²	\$10,204,248	\$5,337,016	\$11,520,904	\$27,062,168
Noncapitalized Equipment ³	400	2,111,463	65,516	2,177,379
Equipment Maintenance & Repair ⁴	37,421	80,883	42,422	160,726
Travel ⁵	8,213	3,023	3,757	14,993
Miscellaneous Operating Expenditures ⁶	4,117	9,172	33,109	46,398
TOTALS	\$10,254,399	\$7,541,557	\$11,665,708	\$29,461,664
Source: COFRS reports.				
¹ Through 11-30-01.				
² Includes items such as antennas and power supply equipment.				
³ Includes items such as connectors and cables.				
⁴ Includes system parts and payments to Motorola, Inc., for maintenance and monitoring services.				
⁵ Includes employee lodging and per diem reimbursements.				
⁶ Includes items such as advertising, equipment rental, communication services, freight, software, vehicle leases and rentals, utilities, and other purchased services.				

As indicated in the previous tables, through Fiscal Year 2002, \$47.8 million has been appropriated for the project, and of that amount, only \$29.5 million has been spent. As of November 2001, an additional \$17 million had been encumbered for the project, nearly all of which was for capital equipment.

Significant Accomplishments

Our audit identified certain areas where the Department should be recognized for its achievements. Specifically, initial cost estimates provided by Motorola, Inc., for the Digital Trunked Radio System project were \$135 million. By leveraging market conditions and utilizing state FTE for engineering and installation tasks, Department staff intend to complete the project for the \$79 million figure noted previously. In addition, our audit showed that, to date, the Department has generally met the deadlines established for project implementation. Although Phase I of the project was not completed on time, the Department appears to have completed Phases II and III of the implementation on schedule. Phases I through III included replacing existing radio systems used by the Colorado State Patrol and other state agencies in the Denver-metro, north, and northeastern part of the State. In addition, we noted that during Phase I, the Department demonstrated successful partnering with local governments which alleviated certain interoperability problems with the agencies using the Digital Trunked Radio System in the Denver-metro area. We commend the Department's employees for their efforts in these areas.

Performance Issues

Chapter 1

Overview

As part of our audit, we reviewed the Department's implementation of the statewide Digital Trunked Radio System. Our audit also included conducting two user satisfaction surveys. Respondents to our surveys included staff from local governments and the Departments of Transportation, Natural Resources, and Public Safety. As of the end of Fiscal Year 2001, the Department is about halfway through the six-phase implementation of the system. Additional items of update since system implementation began in Fiscal Year 1999 include the following:

- C Statutory changes were made to correct a problem with the transfer of the Fiscal Year 2000 appropriation to the Public Safety Communications Trust Fund (Fund). Due to an oversight, funds appropriated in that year had not been transferred from the Capital Construction Fund. The appropriation and back interest were transferred to the Fund as of the end Fiscal Year 2000 to correct this error. Department staff report this problem did not have a negative impact on project implementation.
- C The Department is currently facing delays with the implementation of one of two main components of the Digital Trunked Radio System. Department staff indicated that this part of the project is behind schedule due to delays in getting the funding needed to complete modifications to the building in which certain equipment will reside. Although this part of the system has not yet been installed, Department staff report that it will cause no major delays in overall system implementation.
- C An error by two state agencies made it necessary to expend an additional \$2.9 million over initial cost estimates to supply these agencies with the new radios they will need to participate in the Digital Trunked Radio System. The error occurred because these agencies did not keep Department of Personnel & Administration staff informed of their radio needs. The Department and participating agencies can ensure that this type of mistake does not occur in the future by improving their ongoing communication methods.

This chapter provides information about the more general, performance-related problems we found, whereas Chapter 2 provides information about the financial issues. Performance-related areas that we discuss include the following:

- C Improve efforts to identify, secure, and communicate potential funding sources for Digital Trunked Radio System implementation costs.
- C Conduct fiscal planning that encompasses the life cycle of the system.
- C Improve performance measures.
- C Eliminate unnecessary statutory reporting requirements.
- C Develop a disaster recovery plan.
- C Establish formal agreements with all local governments sharing system infrastructure and/or equipment sites.

The following sections provide more detail on each of these issues.

Improved Interoperability and Coverage Are Key Goals of the System

As previously mentioned, one of the primary goals of the Digital Trunked Radio System is to improve interoperability among federal, state, and local government agencies' public safety radio systems. Interoperability is a concern because many radio communication systems are not compatible, which prevents public safety agencies from easily communicating with one another. The General Assembly has mandated that all Colorado state agencies will participate in the Digital Trunked Radio System. Local government participation, however, is optional. In order to maximize statewide interoperability in Colorado, therefore, the key is to encourage local government participation.

Improving radio system coverage is another key goal of the Digital Trunked Radio System. The system is designed to provide users with 95 percent coverage from all major roads and highways across Colorado. If this level of radio coverage is achieved, it will improve the coverage that now exists in many areas of the State. Adequate radio coverage is important to ensure the safety of the public and the officers using the system, especially during emergencies and in remote or mountainous areas of the State.

During our audit we found problems that may hinder the achievement of these two important goals.

Local Government Participation Could Be Increased

First, we noted that a number of local governments are not participating in the Digital Trunked Radio System. Although many local governments have expressed interest in converting to the Digital Trunked Radio System, only Douglas, Jefferson, Arapahoe, Adams, Broomfield, Larimer, and Weld counties currently have agencies participating in the system. The extent of agency participation within these counties varies from limited to extensive (see Appendix B for more information). The 7 counties listed above are those with participating agencies within the 21-county area covered by Phases I through III of the system's implementation. Local government representatives with whom we spoke indicated various reasons for not converting to the system. These include:

- C **Cost.** Some representatives stated that cost was a significant issue when determining whether to participate in the system, and further, accessing funding for the system has been somewhat difficult. Cost estimates to convert to the Digital Trunked Radio System for agencies we contacted ranged from \$160,000 (for radios for a small city) to over \$6 million (for new radio towers, radios, and other infrastructure for a large county).
- C **Unproven success of the system.** Local agency representatives also expressed concerns regarding whether the system is going to work and if the State will be able to manage it effectively. Whether the State can effectively manage the system is a concern for many local agencies because they may have to give up control of their existing radio system in order to participate in the Digital Trunked Radio System.
- C **Existing radio equipment is sufficient to meet their needs.** Representatives expressing this viewpoint stated that converting to the Digital Trunked Radio System would not be beneficial for them, because they are satisfied with the performance of their existing communications system.

Obviously, the Department does not have the authority or resources to address all of these concerns, nor can it mandate local government participation in the Digital Trunked Radio System. We believe, however, that there are specific steps the Department can take to address certain local government concerns. By acting now, the Department can help maximize local participation in the Digital Trunked Radio System and thereby minimize statewide interoperability concerns.

Improve Efforts to Identify, Secure, and Communicate Potential Funding Sources

One way the Department can help encourage local government participation is by improving its efforts to identify, secure, and communicate potential funding sources for system implementation costs. As mentioned previously, local government staff with whom we spoke indicated that cost was a significant issue when determining whether to participate in the Digital Trunked Radio System, and further, obtaining funding for the system has been somewhat difficult. Although the statutes governing the Public Safety Communications Trust Fund allow for loans to be provided to state and local governments for purchasing digital trunked radio equipment (Section 24-30-903(1)(j), C.R.S.), we found that Department staff have not formally requested funding for this purpose. Instead, staff indicated that they have only verbally communicated the funding needs of local governments to the General Assembly (i.e., through public testimony related to the project). All project appropriations to date have been sufficient to cover only the costs of basic system implementation (i.e., additional funding for loans has not been included in project funding appropriated through Fiscal Year 2002).

Funding for loans could be secured through a couple of different approaches. For example, the Department could seek legislative approval to use the interest now accruing in the Fund (\$2.9 million as of November 30, 2001) to provide loans for local governments desiring to participate in the system. Further, when the State's budget situation improves, the Department could seek a general fund appropriation to build additional corpus in the Fund, thereby increasing the funding available for loans even more. If funding for loans becomes available, the Department will need to establish detailed procedures for administering a loan program. Items that will need to be resolved through the development of such procedures include:

- C Should interest be charged on loans and, if so, at what rate?
- C How is each loan amount determined?
- C What is the loan payback period?
- C What if an agency defaults on its loan?
- C What method will be used to prioritize loan requests if funds are not available to cover all agency requests?

Department staff further suggested that an improved budget situation might also give the State the opportunity to provide grants for prospective local agency participants. Because current law does not explicitly give the Department the authority to operate a grant program for this purpose, however, statutory changes might be necessary before such a program could be instituted.

We also found that the Department could improve its efforts to inform potential system participants about funding that may be available from federal agencies or other sources. The Department has made some efforts to communicate this type of information through its Web site; however, we found some problems with the information provided. First, we determined that two of the grant programs noted on the Web site would probably not support or provide funding for a project like the Digital Trunked Radio System. Second, the Web site included only one federal funding source. Our review showed that several other potentially viable sources of federal funding exist such as Federal Emergency Management Agency grants and State and Community Highway Safety grants. Third, the links on the Web site to other Internet sites did not always work. Lastly, we identified several potential sources of funding besides federal funds that were not included on the Web site. In addition to federal grants, these include instituting surcharges or user fees on various activities (e.g., hazardous materials' facilities fees), soliciting donations from foundations or corporations, and holding fund-raisers. Some of these funding mechanisms could have an impact on local governments regarding TABOR. We also noted that in addition to placing this information on its Web site, the Department could also use other means of communicating potential funding sources to local agencies such as contacting them via newsletters and/or email.

Users Report Problems With Coverage and Other Performance Issues

The second major issue we noted is related to coverage and associated aspects of system performance. As previously mentioned, improving radio system coverage is one of the key goals of the Digital Trunked Radio System. Many respondents to our user survey reported dead zones or other system performance problems (e.g., busy signals, site transfer/zone switching failures, loss of voice transmission capabilities, and inconsistent voice transmission volume) in areas of the State where the system installation is complete. We are unsure of the extent of these problems or others that may exist, because the Department lacks a formal process for managing user complaints and feedback regarding the Digital Trunked Radio System.

In addition, 15 out of 36 respondents to our user surveys (42 percent) indicated that 95 percent coverage is not sufficient to meet their needs. Motorola, Inc., provided us with an estimate for extending coverage to 98 percent for mobile users along all major roads and highways across Colorado. Costs were approximately \$168 million for infrastructure alone. As noted earlier, the current estimated cost of implementing the system at the 95 percent coverage level is \$79 million. Current budget constraints may make extending coverage cost-prohibitive; however, system-related equipment costs will likely decrease

in the future, so it may be reasonable and cost-beneficial to extend coverage beyond the 95 percent level at some point.

Improve Efforts to Identify and Resolve Potential Problems

We identified some steps the Department can take to address coverage concerns and other potential performance issues with the system. These include:

- C **Continuing to test actual radio system coverage and periodically evaluating the cost-benefit of extending that coverage.** Department staff told us that testing indicates that the system is providing 95 percent coverage (as planned) in the areas where implementation is complete. As mentioned previously, however, users still have concerns about actual radio coverage. User concerns may indicate that the 95 percent coverage goal is not being met in some locations and testing has failed to identify these instances (i.e., dead spots exist where they should not). On the other hand, we also noted that user concerns may indicate a desire for coverage beyond the 95 percent goal (i.e., actual coverage is at the 95 percent level, but users believe that more extensive coverage is needed to ensure officer safety or for other reasons). Both types of concerns are valid. To address the first concern, the Department should continue to test actual radio system coverage and correct problems as they are identified. To address the second concern, the Department should periodically evaluate the cost-benefit of extending coverage beyond the 95 percent level. Periodically evaluating the cost-benefit of extending coverage will help ensure that the system continues to meet user needs.

- C **Establishing a formal complaint-handling process.** Currently the Department handles user complaints and concerns about the system informally through telephone conversations, email, and periodic meetings with certain users (e.g., Colorado State Patrol). Although these approaches provide an opportunity to share concerns about the system, Department staff report that they do not have a systematic method for handling the information they receive via these avenues. To ensure that all valid concerns about the Digital Trunked Radio System are addressed in a timely and appropriate manner, and to reduce the possibility that user concerns may go unaddressed, the Department should develop a more formalized complaint-handling system. It should include, at a minimum, the following: developing a standardized, well-publicized complaint intake process; establishing requirements for logging and periodically monitoring the status of complaints received;

creating a standardized procedure for communicating with individuals who initiate a complaint so they are kept informed of Department actions to address the problem identified; and developing guidelines for the timely investigation and disposition of complaints. To the extent possible, the Department should use advanced technology to implement this recommendation (e.g., allow users to submit complaints via the Internet or email).

Concerns regarding participation, coverage, and other performance problems may not be alleviated until the Digital Trunked Radio System is fully implemented and the Department has demonstrated success in managing it. The Department can, however, take certain steps now to identify and resolve some issues in an effort to encourage local government participation and ensure the overall success of the system. Identifying problems now provides the Department with the opportunity to take corrective actions while funding and staff for the project are still available.

Recommendation No. 1:

The Department of Personnel & Administration should improve its efforts to identify, secure, and communicate potential funding sources for Digital Trunked Radio System implementation costs. This should include:

- a. Making a formal request through the budget process for funding to provide loans or other types of financial assistance to local governments desiring to participate in the system. If funding for loans is obtained, the Department should develop detailed procedures for loan administration. If funding for grants is obtained, the Department should work with the General Assembly to ensure it has proper statutory authority to operate a grant program.
- b. Continuing to investigate potential alternative funding mechanisms for both state and local entities desiring to participate in the system and communicating this information via its Web site and other means such as newsletters and/or email.

Department of Personnel & Administration Response:

- a. Agree. The Department will work with the Office of State Planning and Budgeting to develop a funding request for Fiscal Year 2004 consistent with the intent of House Bill 98-1068. At that time, the

Department will request clarification from the General Assembly to determine if the funds will be dispersed in the form of grants or loans. Detailed procedures will be developed for distribution dependent upon the clarification received.

- b. Agree. The search for new potential funding sources is an ongoing effort. All information we acquire will be posted on our existing Web site as it becomes available.

Implementation date: November 1, 2002.

Recommendation No. 2:

The Department of Personnel & Administration should improve its efforts to identify and resolve potential problems with the Digital Trunked Radio System. This should include:

- a. Continuing to test the system to ensure that it is providing 95 percent coverage along all major roads and highways across Colorado and periodically reviewing the cost-benefit of extending that coverage.
- b. Developing a formal approach for handling complaints and other feedback about the system. This approach should include, at a minimum, the following components: a standardized, well-publicized intake process; requirements for logging and periodically monitoring the status of complaints received; a standardized procedure for communicating with individuals who initiate a complaint; and guidelines for the timely investigation and disposition of complaints.

Department of Personnel & Administration Response:

- a. Agree. Coverage testing for implemented phases of the project are complete. Testing will continue on an ongoing basis.
- b. Agree. The Department has partially implemented this process and is currently working to standardize and formalize these operations statewide. All aspects of this recommendation will be implemented and will include telephone and Internet access.

Implementation date: June 30, 2002.

Develop a Fiscal Plan for the Life Cycle of the System

Authoritative guidance on radio communication systems indicates that funding strategies for these systems are most effective when they encompass the entire life of the system. By considering costs on a life cycle basis, agencies are forced to develop a funding strategy that not only identifies fiscal resources for acquiring the system but also plans for acquiring the resources necessary for operations, maintenance, and eventual system replacement.

During our audit we found that the Department has not developed a formal fiscal plan for the life cycle of the Digital Trunked Radio System, which is estimated to be between 7 and 10 years for radios and 15 years for infrastructure. This is a concern because the equipment associated with the Digital Trunked Radio System includes approximately 10,800 mobile and portable radios, numerous transmitter sites, and five dispatch centers. Each of these components has a differing life expectancy and replacement cost, some of which may be quite significant.

Department staff have estimated some ongoing maintenance and monitoring costs for the Digital Trunked Radio System. These estimates, however, are not useful, because they were made on the basis of old assumptions about system components. Existing cost estimates also do not encompass the life cycle of the system, nor do they include equipment replacement costs for radios and all infrastructure. Further, the Department has not determined whether maintenance and monitoring functions will continue to be conducted by Motorola, Inc., or by Department staff. Costs vary dramatically depending upon whether the Department or Motorola, Inc., performs these duties, with outsourcing to the current contractor being the significantly more expensive option at this time.

In addition to estimating ongoing maintenance and monitoring costs for the life cycle of the system, the Department should investigate options for funding post-implementation needs as it develops its funding plan, in case general funds are not available to cover these costs. Options include:

- C **Charging user fees.** The Digital Trunked Radio System implementation plan discusses charging user fees for access to the system. Department staff indicated they have not sought to establish user fees because the State was not providing financial assistance to local governments for system implementation costs. It was their position, therefore, that charging user fees would be overly burdensome and might discourage

local entities from participating in the system. Although this is a valid concern, we believe that user fees should be investigated as a method of helping support the cost of system maintenance and equipment upgrades. Statutory changes would most likely be necessary to allow the Department to charge such fees. It should also be noted that establishing user fees for Digital Trunked Radio System participants could cause TABOR-related impacts at the state and/or local levels.

One option for instituting a fee-based funding mechanism that would not necessitate State involvement is allowing a nongovernmental entity to administer the radio system once it is completed. Utah has taken this approach. The Department indicated that the Digital Trunked Radio System users' group has expressed interest in incorporating and providing certain services such as system administration. In addition to collecting fees, this group could provide technical assistance and other feedback to the State about the system.

- C **Establishing an equipment replacement fund.** We found that Washington State established such a fund and recently used the monies it saved in this fund to pay for the complete replacement of its old radio system. Funding was obtained entirely through user fees. Using an equipment replacement fund would help the State avoid the need for large appropriations when replacing components of the Digital Trunked Radio System.

In order to ensure that the necessary funding is available for the post-implementation needs of the Digital Trunked Radio System, the Department should develop a formal fiscal plan for the life cycle of the system. This plan should then be communicated to the General Assembly to ensure that decision makers are informed of the estimated costs.

Recommendation No. 3:

The Department of Personnel & Administration should develop a fiscal plan that encompasses the life cycle of the Digital Trunked Radio System. This should include:

- a. Estimating the costs for radio and infrastructure maintenance, replacement, and monitoring post-implementation.
- b. Making a formal request through the budgetary process as appropriate to gain ongoing funding for post-implementation needs.

- c. Working with the General Assembly in determining whether user fees should be implemented and, if necessary, in making statutory changes to allow the Department to charge user fees.

Department of Personnel & Administration Response:

- a. Agree. The Department developed rough orders of magnitude estimates during the Fiscal Year 2003 budget process. We are currently and continually gathering data on failure rates and maintenance costs to fine-tune post-implementation costs and requirements.
- b. Agree. This is partially implemented. Fiscal Year 2003 was cost neutral primarily to manufacturers' warranty, Fiscal Year 2004 and all post-implementation years will be evaluated during the normal budget cycle and appropriate funding will be requested.
- c. Partially agree. The Department agrees that all alternatives for post-implementation costs should be explored. In 1995 we identified the possible use of user fees to supplement the operational costs. However, based upon more recent information provided to the Department from rural local governments, the use of user fees to support ongoing costs would prohibit their participation in the Digital Trunked Radio System.

Implementation date: November 1, 2002.

Improve Performance Measures

Our audit included a review of the Department's budget documents and capital construction project requests to develop an understanding of the performance information being reported on the Digital Trunked Radio System. Performance information is important so that lawmakers, state managers, users, and the general public have a sound basis upon which to judge whether the State is implementing an effective and efficient communication system and whether the system is correcting the problems it was intended to solve. We found that although the Department has developed some performance objectives for the Digital Trunked Radio System, improvements are needed. For example:

- C **Existing objectives do not address ongoing system performance.** Currently all of the performance measures for the Digital Trunked Radio System relate to achieving certain milestones. For example, the measures discuss adding a certain number of users and completing upgrades

associated with different phases of the implementation plan. Milestone measures are an important part of a performance measurement system; however, once achieved they no longer provide useful information. Performance measures that address the ongoing efficiency and effectiveness of the Digital Trunked Radio System are now needed. Some aspects of ongoing system effectiveness and efficiency that could be measured include:

- C Number of service calls.
- C Time spent on service calls.
- C Number of busy signals.
- C Length of time in busy queue.
- C Number of complaints.
- C Percentage of customers satisfied.
- C Number of users provided with service in a given time.

These measures should be periodically reviewed and updated throughout the life of the system.

- C **Performance data are not prominently displayed, nor are they reported every year.** We also had difficulty locating the performance information for the Digital Trunked Radio System. Typically, performance information is reported in the Department's annual budget request documents. Because the Digital Trunked Radio System is a capital construction project and an information technology project, however, performance information about the system could be reported in several different documents in any one year. We also noted that performance information was not formally reported in the Department's most current budget request (Fiscal Year 2003). To maximize its usefulness, performance data should be easy to access and reported on a regular (i.e., annual) basis.

Recommendation No. 4:

The Department of Personnel & Administration should improve the performance measures for the Digital Trunked Radio System. This should include:

- a. Developing performance measures that address the ongoing performance of the system. These measures should be periodically reviewed and updated throughout the life of the system.

- b. Clearly and formally reporting performance annually to the General Assembly.

Department of Personnel & Administration Response:

- a. Agree. The Department early on in the project identified performance measures consistent with the recommendation. The hardware that makes meeting this requirement possible will be installed during the first calendar quarter of 2002 with full implementation by June of 2002.
- b. Agree. Detail will be included beginning with the Fiscal Year 2004 budget request.

Implementation date: November 1, 2002.

Seek Repeal of Unnecessary Reporting Requirements

We reviewed statutes governing the Public Safety Communications Trust Fund. We found a requirement that has not been complied with because it is generally considered unnecessary. State law (Section 24-30-908.5(6), C.R.S.) requires the Executive Director of the Department of Personnel & Administration to "keep an accurate account of all activities related to the Fund including its receipts and expenditures and...annually, in the month of January, report such information to the State Auditor." The Department has been out of compliance with this reporting requirement since it was instituted, although staff quickly remedied this problem when it was brought to their attention at the commencement of our audit. Even though the Department is now in compliance with the reporting requirement, we believe that it is unnecessary because detailed fund activity information remains available and immediately accessible in COFRS for at least five years.

Recommendation No. 5:

The Department of Personnel & Administration should work with the General Assembly to introduce legislation to eliminate the statutory requirement for the

Executive Director to report all Public Safety Communications Trust Fund activity to the State Auditor on an annual basis (Section 24-30-908.5(6), C.R.S.).

Department of Personnel & Administration Response:

Agree. The Department will work with the General Assembly to eliminate this statutory requirement.

Implementation date: May 2003.

Develop a Disaster Recovery Plan

During our audit we found that the Department has not developed a comprehensive disaster recovery plan for the Digital Trunked Radio System. A disaster recovery plan provides direction and protocols for emergency response, backup operations, and post-disaster recovery, should an emergency or disaster occur. Examples of such emergencies or disasters include lightning, flood, tornadoes, power surges, and fire. Further, since Digital Trunked Radio System equipment is located throughout the State, there is increased risk that a disaster could occur and damage some components. In addition to natural disasters, law enforcement crises also place added demands on communication systems. Therefore, high-load (i.e., usage) testing is a critical part of disaster recovery for a communications system like the Digital Trunked Radio System.

Department staff indicated that a Digital Trunked Radio System users' group, made up of both state and local representatives, is working on developing a disaster recovery plan. Staff believe that allowing this group to develop a plan collectively will result in the plan's being better received than if a plan were designed solely by the Department. At the time of our audit, a plan had not yet been formulated, even though numerous agencies are now using the system on a daily basis. Without formal disaster recovery procedures in place, users risk losing radio operations and critical data if a crisis occurs. Therefore, we believe that the Department should immediately initiate the development of a disaster recovery plan in collaboration with the Digital Trunked Radio System users' group. Once developed, the plan should be implemented, tested, and updated as necessary to ensure its continued usefulness.

Recommendation No. 6:

The Department of Personnel & Administration should work with the Digital Trunked Radio System users' group to develop, implement, test, and periodically update a comprehensive disaster recovery plan for the Digital Trunked Radio System.

Department of Personnel & Administration Response:

Agree. The Digital Trunked Radio System was designed with multiple levels of redundancy to minimize catastrophic failure. The system can assign resources dynamically during natural and man-made disasters to provide communications when you absolutely must have them. The operational disaster plan is in process, but has progressed very slowly due to the large number of participants involved. To move the process forward, the Department will provide and implement a basic plan within the calendar year consistent with the original 1995 "Digital Trunked Radio Plan" and will continue to work with participants of the Digital Trunked Radio System users' group to develop a comprehensive plan.

Implementation date: December 31, 2002.

Establish Formal Agreements With Participants

We found that the Department is not using formal agreements with all local governments sharing space or equipment for the Digital Trunked Radio System. Department staff indicate that they establish Memorandums of Understanding (MOUs) only if local government officials request such an agreement. The MOUs currently in place provide details on the purpose of the agreement; each party's responsibilities for providing, installing, and maintaining equipment; fee schedules for sharing equipment and/or space; and procedures for accessing sites. We believe the Department should require formal agreements such as these in all instances where the State and local government participants share Digital Trunked Radio System infrastructure and/or equipment sites.

Establishing written agreements will help prevent misunderstandings in the future and ensure that all parties' responsibilities regarding system maintenance and other issues are clearly understood.

Recommendation No. 7:

The Department of Personnel & Administration should establish agreements with all local governments sharing Digital Trunked Radio System infrastructure and/or equipment sites. At a minimum, such agreements should define each party's responsibilities for providing, installing, and maintaining equipment; establish fee schedules for sharing equipment and/or space; and specify procedures for accessing sites.

Department of Personnel & Administration Response:

Agree. This is partially implemented with a number of agreements in place to date. The Department is working on a standardized agreement that will address all points of the recommendation.

Implementation date: December 31, 2002.

Financial Issues

Chapter 2

Overview

As part of our audit, we reviewed the financial records related to the Fund to determine whether the Department has established adequate controls to ensure that Fund activities are recorded and reported in an accurate, timely, and complete manner. Our audit procedures included reviewing internal controls and testing a sample of various financial transactions. Although the Department's internal controls appear to be generally adequate, we found that the Department could make the following improvements in its fiscal management of the Fund:

- Ⓒ Establish an internal policy governing the periodic inventory of Digital Trunked Radio System components.
- Ⓒ Improve supervisory review of travel reimbursement requests.
- Ⓒ Ensure payments to vendors are processed in a timely manner.

The following section provides more detailed information on each of these issues.

Develop an Inventory Policy for Digital Trunked Radio System Components

The Digital Trunked Radio System, when complete, will consist of a variety of equipment and infrastructure located throughout the State at a projected value of approximately \$79 million. Items such as mobile and portable radios, radio towers, and antennas will make up the Digital Trunked Radio System upon completion. State statutes (Section 24-17-102, C.R.S.) direct state agencies to institute and maintain systems of internal accounting and administrative control that assure the proper safeguarding of state assets. State Fiscal Rules further require state agencies to ensure that all equipment owned by the State is properly accounted for when acquired, inventoried and safeguarded throughout its useful life, and properly accounted for at the time of disposal.

Department staff perform periodic physical inventories of all components purchased for projects like the Digital Trunked Radio System. Once the system is completed, this would include inventorying low-cost parts such as cables, an approach that will be extremely time-consuming. Neither the State Fiscal Rules nor the State Controller's Fiscal Procedures Manual requires agencies to inventory every item purchased for a project such as the Digital Trunked Radio System. Rather, agencies may develop their own inventory policies for situations such as this. In order to maintain proper control of the assets comprising the Digital Trunked Radio System, the Department should develop an inventory protocol that balances the need for safeguarding assets with the time and effort needed to conduct a physical inventory. The policy should include inventorying any items that have a high risk of theft regardless of their cost, such as radios.

Recommendation No. 8:

The Department of Personnel & Administration should establish a cost-effective internal policy governing the periodic inventory of components for the Digital Trunked Radio System.

Department of Personnel & Administration Response:

Agree. The Department will develop and implement inventory policy by June of 2002.

Implementation date: June 30, 2002.

Improve Supervisory Review of Employee Travel Reimbursement Requests

Because the Digital Trunked Radio System is a statewide project, from time to time certain Department employees must travel to various locations throughout Colorado to install equipment and perform other tasks. State Fiscal Rules allow state employees to request reimbursement for certain travel-related expenses including lodging and meals. To obtain reimbursement for travel expenditures, an employee must complete a travel reimbursement voucher, attach supporting documentation (as required), and then submit the voucher to his or her supervisor for approval.

As part of our audit, we reviewed a sample of 25 payment vouchers for expenses that occurred in either Fiscal Year 2000 or 2001. Eight of these vouchers included requests for the payment of employee travel expenses. We noted that the per diem rate (i.e., the amount paid to the employee for his or her daily meal allowance) used on two of these eight vouchers was incorrect. Specifically, the per diem rate paid was too high given the particular circumstances, resulting in an overpayment to the employee. The Department should improve its supervisory review of employee travel reimbursement vouchers to ensure that employees are using the correct per diem rates. This will help prevent overpayments in the future.

Recommendation No. 9:

The Department of Personnel & Administration should improve supervisory review of employee travel reimbursement vouchers.

Department of Personnel & Administration Response:

Agree. This was implemented the same day as reported by the auditor. All staff were provided the latest travel and per diem rates. An additional layer of review of the expenses was added to ensure compliance with fiscal rules.

Implementation date: August 31, 2001.

Ensure Payments to Vendors Are Made in a Timely Manner

During Fiscal Year 2001 the Department spent approximately \$7.5 million from the Fund to purchase equipment and other components of the Digital Trunked Radio System. State law (Section 24-30-202(24), C.R.S.) and State Fiscal Rules require state agencies to process invoices and other notices of liability for purchases on a timely basis (i.e., within 45 days of the date they were incurred). This requirement helps ensure vendors receive payment in a reasonable time period and also helps the State avoid interest or late payment charges on overdue accounts.

As stated above, during our audit we reviewed a sample of 25 payment vouchers for expenditures that occurred in either Fiscal Year 2000 or 2001. Our review showed that 3 of the 25 payment vouchers were not processed in a timely manner. Specifically, these payments took between 11 and 54 calendar days longer than they should have according to State Fiscal Rules. Overdue payments totaled \$2,627. As mentioned previously, the Department should ensure its payments to vendors are processed in accordance with the timeline established in state law and the State Fiscal Rules in order to avoid interest or late payment charges. Paying bills in a timely manner also encourages vendors to continue doing business with the State.

Recommendation No. 10:

The Department of Personnel & Administration should ensure that payments to vendors are processed in a timely manner.

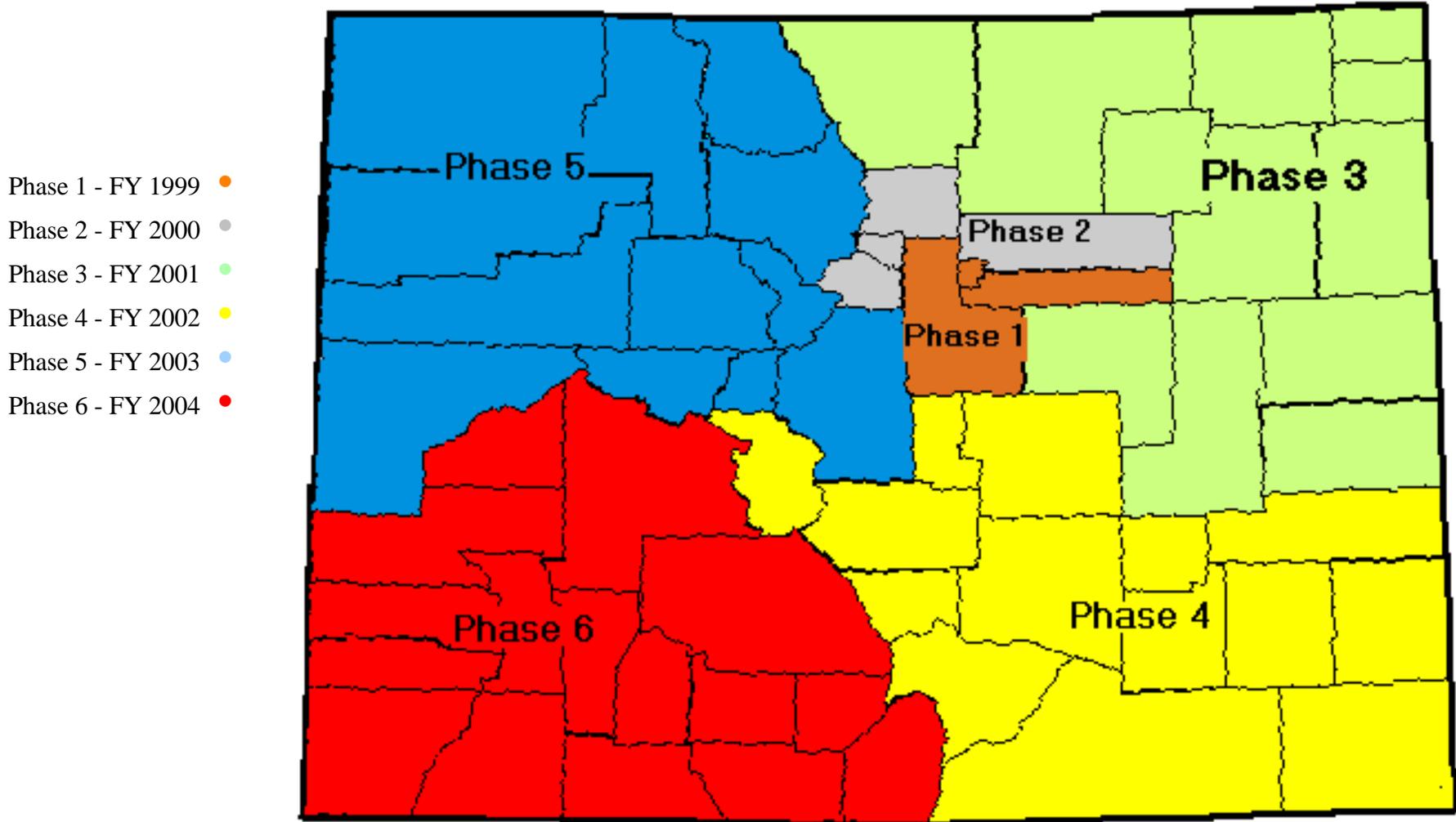
Department of Personnel & Administration Response:

Agree. This recommendation has been implemented. The staff member responsible for processing payables retired causing a temporary delay in processing. The duties of the staff member have been reassigned and cross-training provided to minimize future delays.

Implementation date: September 7, 2001.

Appendix A

Digital Trunked Radio System Implementation Schedule



Appendix B

Digital Trunked Radio System Local Government Participants As of January 2002

Adams County Communications	Jefferson County Open Space
Arapahoe County Sheriff	Jefferson County Public Works
Broomfield Police	Jefferson County Road and Bridge
Castle Rock Fire Rescue	Jefferson County Schools
Castle Rock Police	Jefferson County Sheriff
Castle Rock Public Works	Lakeside Police
City of Greeley	Littleton Fire
Coal Creek Fire	Louviers Fire
Cunningham Fire	Medical Center of Aurora
Douglas County Coroner	Metro Districts Highlands Ranch
Douglas County Public Works	Morrison Police
Douglas County Schools	Mountain View Police
Douglas County Sheriff	North Fork Fire
Edgewater Fire	North Metro Fire
Edgewater Police	North Washington Fire
Elk Creek Fire	Parker Fire
Evergreen Fire	Parker Police
Foothills Fire and Rescue	Parker Public Works
Fort Collins Dial-A-Ride	Platte River Fire Department
Fort Collins Police-SIU	Pleasant View Fire
Fort Collins Transport	Poudre Fire Authority
Franktown Fire	Sheridan Fire
Genesse Fire	Sheridan Police
Golden Fire	Sheridan Schools
Golden Gate Fire	Skyline Fire
Golden Police	South Metro Fire
Highland Rescue	Trumbull Fire
Indian Hills Fire	Weld County
Inter-Canyon Fire	West Douglas Fire
Jackson 105 Fire	
Jefferson County Community Corrections	
Jefferson County Coroner	
Jefferson County District Attorney	

Source: Department of Personnel & Administration.

The electronic version of this report is available on the Web site of the
Office of the State Auditor
www.state.co.us/auditor

A bound report may be obtained by calling the
Office of the State Auditor
303-866-2051

Please refer to the Report Control Number below when requesting this report.

Report Control Number 1387