

# Report on Funding Strategy for Public Safety Radio Communications



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## **FOREWORD**

This report serves as a primer for developing funding strategies to replace or upgrade public safety radio communications systems. These systems are essential in providing public safety services effectively and safely. The report highlights the importance of developing funding strategies that consider the cost of a public safety communications system over its complete life cycle.

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## EXECUTIVE SUMMARY

Public safety agencies nationwide confront a number of concerns regarding the state of public safety communications, including the need for interoperability between and among agencies, the aging of the existing communications infrastructure, and the desire to implement new technologies. To address these concerns, public safety agencies must replace or upgrade their communications systems. The considerable cost of replacing these systems, coupled with the general lack of experience in procuring large information technology systems, presents these agencies with a funding challenge. This challenge is magnified by the fact that public safety agencies must compete with other governmental agencies (i.e., transportation and education) for limited financial resources.

This report demonstrates the importance of developing sound funding strategies as part of the replacement or upgrade of public safety wireless communications systems. A funding strategy for public safety wireless communications is most effective when it encompasses the entire life cycle of a land mobile radio (LMR) communications 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 fiscal resources necessary for operations, maintenance, and eventual system replacement. In addition, a funding strategy for the complete life cycle mitigates the potential for project budget overruns, which may negatively influence policy and budget decision makers in their consideration of future funding requests.

A funding strategy may include several funding sources, especially during the procurement and installation phase. The information in this report builds on the *PSWN Report on Funding Mechanisms for Public Safety Radio Communications (PSWN Funding Mechanisms Report)*, which identified a number of funding sources that public agencies have typically used during the procurement and installation phase of the systems development life cycle. The *Funding Strategies Report* organizes selected funding sources included in the *PSWN Funding Mechanisms Report*, as well as additional funding sources, to offer potential funding sources for each phase of LMR systems development. These funding sources were selected based on several factors such as sustainability, availability, and predictability.

A funding strategy is distinctly different from a financing method. The funding strategy is associated with the entire life cycle and may include several financing methods and funding sources. Furthermore, one financing method may include several funding sources. For example, a jurisdiction may choose to finance its system replacement with a lease purchase agreement over a seven year contract period, with the funding source being a combination of asset forfeiture proceeds and capital appropriations.

The LMR life cycle can be divided into three main phases of systems development—planning and design, procurement and installation, and operations and maintenance. Each phase requires a different level of funding. The planning and design phase includes activities such as requirements analysis and technology assessments, as well as the development of a sound funding strategy. This phase of the life cycle costs relatively little compared with procurement and operations and can be funded primarily by redirecting existing financial resources. If existing

resources are unavailable, asset forfeiture proceeds and grants are possible options for additional revenue.

Because of the costs of procuring and installing LMR equipment, these systems should be viewed as capital assets and financed over the expected service life of the system. Depending on the level of government, the procurement and installation of LMR equipment is generally financed through one of three methods—capital appropriations, bond proceeds, and lease-purchase agreements. Once a financing method is selected, a revenue source must be identified to support the fiscal requirements of that method.

The operations and maintenance phase of the life cycle includes both day-to-day management and administration of the system. To avoid funding spikes to replace major component parts of the system, and to ensure that sufficient fiscal resources are available to replace the entire system in the future, public safety agencies should consider establishing a capital replacement or sinking fund.

Because many agencies may not have the fiscal resources necessary to develop wholly owned, independent systems, this report also provides some alternative cost-sharing approaches to improving public safety communications. These approaches include partnering with neighboring jurisdictions, other public safety agencies, or commercial entities. The judicious use of commercial services is another cost-leveraged alternative to building and maintaining a new system, provided commercial services are available and meet the communications requirements of the agency or jurisdiction (e.g., security, coverage area, and priority access).

## **ACKNOWLEDGMENTS**

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# TABLE OF CONTENTS

	PAGE
<b>1.0 INTRODUCTION .....</b>	<b>1-1</b>
1.1 Background.....	1-2
1.2 Assumptions .....	1-2
1.3 Organization.....	1-3
<b>2.0 METHODOLOGY .....</b>	<b>2-1</b>
<b>3.0 PLANNING AND DESIGN .....</b>	<b>3-1</b>
3.1 Asset Forfeiture.....	3-2
3.1.1 Federal Asset Forfeiture Programs.....	3-2
3.1.2 State and Local Asset Forfeiture Programs.....	3-2
3.1.3 Pros and Cons.....	3-3
3.2 Grants .....	3-4
3.2.1 Federal Grants Directed to Public Safety .....	3-4
3.2.2 State Grants Directed to Public Safety.....	3-5
3.2.3 Pros and Cons.....	3-5
<b>4.0 PROCUREMENT AND INSTALLATION.....</b>	<b>4-1</b>
4.1 Federal Excise Tax .....	4-3
4.1.1 Pros and Cons.....	4-3
4.2 Spectrum Lease Fees .....	4-4
4.2.1 Pros and Cons.....	4-4
4.3 Right-of-Way Fees.....	4-5
4.3.1 Pros and Cons.....	4-6
4.4 Utility Tax/Surcharge Fees.....	4-6
4.4.1 Pros and Cons.....	4-7
<b>5.0 OPERATIONS AND MAINTENANCE.....</b>	<b>5-1</b>
5.1 Tower Space Leasing.....	5-3
5.1.1 Pros and Cons.....	5-4
5.2 Impact Fees .....	5-5
5.2.1 Pros and Cons.....	5-6
<b>6.0 ALTERNATIVE APPROACHES TO IMPROVED PUBLIC SAFETY COMMUNICATIONS .....</b>	<b>6-1</b>
6.1 Multi-Jurisdictional.....	6-1
6.1.1 Pros and Cons.....	6-2

6.2 Public/Private Partnerships.....6-3  
6.2.1 Pros and Cons.....6-3  
6.3 Commercial Services .....6-4  
6.3.1 Pros and Cons.....6-5  
  
**7.0 CONCLUSION.....7-1**  
  
**APPENDIX A—ABBREVIATIONS AND ACRONYMS.....A-1**

## TABLE OF FIGURES

Figure 2-1	Funding Sources Matrix.....	2-1
Figure 2-2	Systems Development Life Cycle Steps .....	2-2
Figure 2-3	Systems Life Cycle Fiscal Requirements .....	2-3
Figure 3-1	Funding Sources Matrix—Planning and Design Phase .....	3-1
Figure 4-1	Funding Sources Matrix—Procurement and Installation Phase .....	4-2
Figure 5-1	Systems Life Cycle Fiscal Requirements .....	5-2
Figure 5-2	Funding Sources Matrix—Operations and Maintenance Phase.....	5-3



## 1.0 INTRODUCTION

Public safety agencies—at every level of government and in every jurisdiction across the country—depend on land mobile radio (LMR) communications systems to provide their services. The ability of public safety personnel to communicate with each other in an effective, efficient manner directly affects the safety and well-being of the public, as well as the personal safety of the public safety service providers. Unfortunately, the communications systems currently used by public safety agencies are often outdated and incompatible with each other. These systems often employ antiquated technology and lack the capacity to handle the increasing number of users or the increasing demand for new functionality, such as mobile data, imagery, and video transmission. Recognizing and, in many cases, experiencing the consequences of ineffective communications, many public safety agencies are replacing their communications systems to handle the increased number of users, employ newer technologies, interoperate with other agencies or jurisdictions, and ensure system security.

One study estimated the current replacement value of the existing public safety LMR infrastructure nationwide at \$18.3 billion.<sup>1</sup> The estimated cost of an LMR system for state or local jurisdictions can range from tens of thousands to hundreds of millions of dollars depending on the size and type of system being implemented. These cost estimates account only for the procurement of the equipment and infrastructure and do not include ongoing operation and maintenance costs. The extraordinary investment in LMR systems makes obtaining the necessary funding to finance the replacement or upgrade of LMR systems one of the greatest challenges facing public safety agencies.

A related challenge for public safety agencies is the general lack of experience in procuring LMR systems. Replacement of most equipment used by public safety agencies (e.g., vehicles) is generally established in the budget process and is typically based on a regular replacement schedule or formula. However, many existing LMR systems have been in service over 20 years—well beyond the 8 to 10 year service life. Therefore, many public safety agencies are less informed about the financing alternatives available for procuring systems of this fiscal magnitude than they are about more frequently occurring procurements.

This report is intended to provide information to assist public safety agencies in developing sound funding strategies for the replacement or upgrade of their communications systems. It describes a variety of potential funding sources. Used in combination these sources can form funding strategies tailored to a particular agency or jurisdiction's fiscal situation. The report emphasizes funding LMR systems across the full life cycle—from conceptual design to full-scale operation. No matter what combination of funding sources is used, it is essential for public safety agencies to develop a funding strategy that will identify and establish revenue sources to support all phases of the systems development life cycle.

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<sup>1</sup> *Land Mobile Radio Replacement Cost Study*, Public Safety Wireless Network Program, Fairfax, VA, June 1998.

## 1.1 Background

Recently, several factors have prompted public safety agencies at all levels of government to replace or upgrade their LMR systems. The increase in procurement activity is primarily attributable to:

- Insufficient system capacity
- Inadequate system functionality
- Federal narrowband policy initiatives.

Public safety communications systems typically reach the end of their useful life cycle in 8 to 10 years. By that time, systems lack the capacity to support the current number of users, a number generally higher than the systems were originally designed to support. System overload and age causes frequent congestion and disruption of service, and many systems cannot be expanded to accommodate additional users. As systems approach their full service life, they incur excessive repair and maintenance expenses. In some cases, replacement parts are no longer available.

Furthermore, existing public safety communications systems at all levels of government cannot support readily available functionality that would greatly enhance the efficiency and safety of public safety personnel. Many agencies are compelled to modernize their public safety communications systems not only to support voice communications more efficiently, but also to support a range of current and emerging data applications.<sup>2</sup> These applications include computer-aided dispatch, in-vehicle report writing, and direct access to national public safety databases (e.g., missing persons checks).

In addition, the National Telecommunication and Information Administration (NTIA) has established a migration plan requiring all federal agencies to replace current LMR equipment with narrowband (12.5 kHz) equipment by the year 2005. This requirement will prompt federal agencies to replace a significant portion of the federal public safety communications infrastructure.

## 1.2 Assumptions

Available funding sources vary from jurisdiction to jurisdiction and from agency to agency. This may be due to political and economic circumstances that may deny one agency access to funding sources available to other agencies. To compensate for these variations, the report makes the following assumptions:

- The jurisdiction in which the public safety agency operates has no dedicated sources of revenue and no additional taxing authority or debt issuing capacity to provide fiscal resources to replace or upgrade public safety communications systems.

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<sup>2</sup> *Land Mobile Radio Procurement Report*, Public Safety Wireless Network Program, Fairfax, VA, March 1998.

- The funding sources identified in this report are politically and economically viable because they have been successful in other public safety agencies, market sectors, or countries.
- The pros and cons associated with each revenue source are not exhaustive. Availability of revenue sources within any given jurisdiction can be affected by a number of given factors (i.e., political or economic).
- The revenue sources identified in this report and in the *PSWN Funding Mechanisms Report* can be used in combination to develop a funding strategy.
- This report assumes that the need for LMR system replacement is already known and does not address the fiscal requirements for determining if a system needs to be replaced.

### **1.3 Organization**




This report consists of an executive summary and seven sections organized as follows:

- Section 1 summarizes the background, assumptions, and organization of the report.
- Section 2 explains the methodology employed to develop the report.
- Section 3 discusses possible funding sources for the planning and design phase of the systems development life cycle.
- Section 4 presents possible funding sources for the procurement and installation phase of the systems development life cycle.
- Section 5 examines possible funding sources for the operations and maintenance phase of the systems development life cycle.
- Section 6 discusses alternative approaches to improved public safety communications.
- Section 7 concludes the report.

## 2.0 METHODOLOGY

The methodology employed to develop this report began with gathering data from academic textbooks on finance and public administration, trade association and government publications, Internet Web sites devoted to public finance and public safety, and interviews with state and local budget and public safety officials. Academic and professional publications were used for background information on life-cycle processes and project management. They provided the necessary framework to organize and present the contents of this report. In addition, telephone and personal interviews were used to augment the information obtained from written sources. The interviews were important for obtaining a practical understanding of revenue sources and funding mechanisms, as well as information on the specific examples included in this report.

The information presented in this report builds on the work of its predecessor, the *PSWN Funding Mechanisms Report*. That report identified various funding sources that public safety agencies have used to acquire wireless communications systems. The present report builds on that information by classifying several of those funding sources by phase of systems development and by level of government. This classification is depicted in Figure 2-1. A description of the funding sources and, when available, relevant examples are provided. In addition, the report includes a discussion of alternative approaches to improving public safety communications in an environment of insufficient fiscal resources.

	<b>Planning and Design</b>	<b>Procurement and Installation</b>	<b>Operations and Maintenance</b>
<b>Federal</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> </ul>	<ul style="list-style-type: none"> <li>• Annual Appropriations</li> <li>• Federal Excise Tax</li> <li>• Spectrum Lease Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> </ul>
<b>State</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> <li>• Federal Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Right-of-Way Fees</li> <li>• Utility Tax/Surcharge Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> </ul>
<b>Local</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> <li>• Federal/State Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Right-of-Way Fees</li> <li>• Utility Tax/Surcharge Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> <li>• Impact Fees</li> </ul>

**Figure 2-1 Funding Sources Matrix**

The considerable cost of implementing an LMR system and the need to support the system over its entire service life necessitates sound systems planning. Systems life-cycle planning includes developing a funding strategy to ensure there are sufficient fiscal resources throughout the entire systems life cycle and that these resources are effectively expended. This report takes the position that LMR systems development costs must be considered on a life cycle basis.

A systems life cycle is an evolutionary process that encompasses the chronological steps from the initial recognition of need for a new system to full-scale system operation. The development of a public safety LMR system resembles the life cycle of other physical infrastructures or information technology systems. The systems life cycle can be divided, as Figure 2-2 illustrates, into six generic steps—planning for a solution, developing a system design, procuring the necessary equipment, constructing and installing the infrastructure, operating the system, and providing the necessary maintenance and system support.

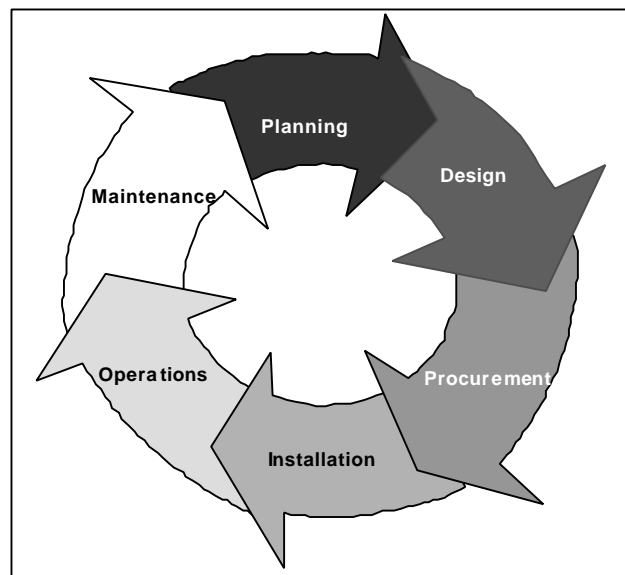
**Figure 2-2  
Development Life Cycle**

Although each of steps requires different resources, they can be three main phases of development costs:

- Planning and
- Procurement
- Operations

Using a life-cycle provides a way to capture both

term systems development costs, thereby helping agencies to anticipate and plan for overall systems development. Each of these phases is distinctly different in the nature of financial resources required, as depicted in Figure 2-3. The procurement and installation phase requires the most fiscal resources. However, during the out years of the system’s operation, substantial resources may be required to address the replacement of major system components that fail. The fiscal resources required to address these major component failures are represented in the chart by the spikes in the operations and maintenance phase.

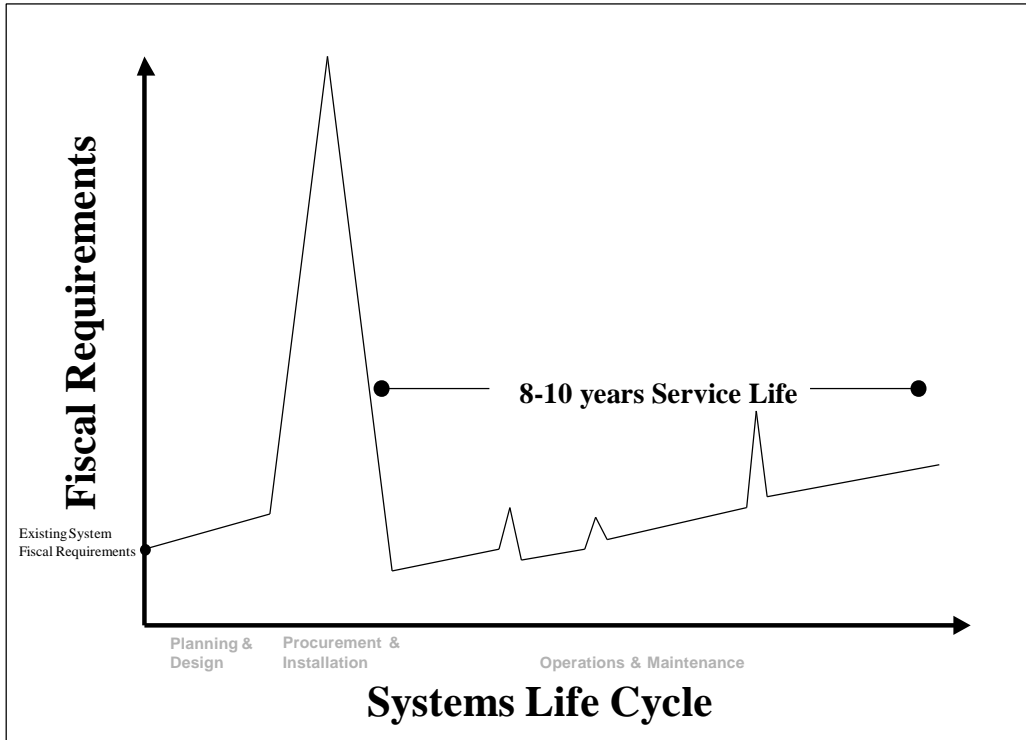


**Systems Steps**

these levels of financial combined into systems

design and installation and maintenance.

approach comprehensive short- and long-






**Figure 2-3 Systems Life Cycle Fiscal Requirements**

### 3.0 PLANNING AND DESIGN

The first phase of the systems development life cycle is planning and design. This phase involves several activities, such as determining user requirements, reviewing available technologies, identifying a technical concept, and developing a project schedule. It also includes conducting a preliminary analysis of risk and its potential impact on schedule, cost, and performance requirements. Proper planning and design can mitigate cost overruns, keep the project on schedule, and make the transition to a new or upgraded LMR system operationally seamless.

The planning and design phase is important because it influences the overall cost of implementing an LMR system. A critical part of this phase is the development of a funding strategy to ensure that fiscal resources are available to meet both short- and long-term needs. Sound planning can help agencies to anticipate, contain, and reduce costs during the later phases of the life cycle.

Costs associated with the planning and design phase of the life cycle are relatively low compared with the procurement and operation of the LMR system itself. The planning and design phase does not require procurement of equipment and can typically be financed by redirecting existing financial resources. In addition, the matrix in Figure 3-1 lists several potential funding sources that could be used in the planning and design phase for each level of government that is replacing or upgrading their LMR system.

	<b>Planning and Design</b>	<b>Procurement and Installation</b>	<b>Operations and Maintenance</b>
<b>Federal</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> </ul>	<ul style="list-style-type: none"> <li>• Annual Appropriations</li> <li>• Federal Excise Tax</li> <li>• Spectrum Lease Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> </ul>
<b>State</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> <li>• Federal Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Right-of-Way Fees</li> <li>• Utility Tax/ Surcharge Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> </ul>
<b>Local</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> <li>• Federal/State Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Right-of-Way Fees</li> <li>• Utility Tax/Surcharge Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> <li>• Impact Fees</li> </ul>

## Figure 3-1 Funding Sources Matrix—Planning and Design Phase

### 3.1 Asset Forfeiture

Revenue from asset forfeitures is realized by auctioning property seized by public safety agencies as a result of criminal investigations. Proceeds from asset forfeitures are separate and distinct from traditional civil forfeitures, which are realized through property liens associated with delinquent taxes and are generally already included in budget revenue forecasts. As such, asset forfeiture proceeds from law enforcement activities, especially drug enforcement, are not intended to replace or supplant any funding that already supports public safety agencies.

#### 3.1.1 Federal Asset Forfeiture Programs

Federal asset forfeiture programs exist in both the Department of Justice (DOJ) and the Department of the Treasury. DOJ administers its program through the Asset Forfeiture Office of the Criminal Division, which provides direction, policy, and general oversight for the program. Since 1985, more than \$3.8 billion in forfeiture proceeds have been deposited in the DOJ Asset Forfeiture Fund. In fiscal year 1994, forfeited proceeds totaled \$549.9 million. When federal law enforcement agencies engage in investigations in conjunction with state and local law enforcement agencies, the nonfederal agencies usually receive a share of the asset forfeiture proceeds. In fiscal year 1994, a total of \$134.6 million in forfeited proceeds and \$7.3 million in forfeited property was distributed to state and local law enforcement agencies in accordance with the provisions of the Comprehensive Crime Control Act.<sup>3</sup>

The Department of the Treasury Forfeiture Fund is administered by the Department's Executive Office for Asset Forfeiture. In fiscal year 1995, forfeited proceeds totaled \$111 million, \$58 million of which was provided as revenue to state and local agencies. The Treasury Forfeiture Fund Act of 1992 mandates sharing of asset forfeitures between DOJ and the Department of the Treasury to reflect the relative participation of their respective agencies in joint investigations. At times, the departments have similar missions and work together to accomplish their goals.<sup>4</sup>

Despite existing competition for these funds within DOJ and the Department of the Treasury, the Federal Government could use a portion of its asset forfeiture proceeds to provide the fiscal resources required for the planning and design of new or upgraded federal LMR systems. The use of federal asset forfeiture proceeds as a source of revenue to replace or upgrade public safety communications systems was first suggested in action item A06 of the *Access America* report published by the National Performance Review (NPR).

#### 3.1.2 State and Local Asset Forfeiture Programs

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<sup>3</sup> *Annual Report of the Department of Justice Asset Forfeiture Program, Fiscal Year 1994*, U.S. Department of Justice, Washington D.C.

<sup>4</sup> *Treasury Forfeiture Fund, Annual Report, Fiscal Year 1995*, U.S. Department of the Treasury, Washington D.C.



Many states and local jurisdictions have developed their own asset forfeiture programs. These programs are created either to deposit proceeds associated with participating in an investigation with another law enforcement agency or to deposit proceeds from seized assets within the individual jurisdiction. For example, the State of Louisiana, through the Seizure and Controlled Dangerous Substances Property Forfeiture Act of 1989, has established a fund to administratively account for asset forfeiture proceeds. Under this act, 20 percent of the proceeds resulting from asset forfeiture are directed to the Louisiana Commission on Law Enforcement for computer information systems and crime laboratory services.<sup>5</sup>

Monroe County, Michigan is an example of a locality using asset forfeiture proceeds to help augment the funding of public safety programs. After researching various funding options, the Monroe County Sheriff's Office concluded that using forfeiture proceeds for proposed public safety initiatives was the best method of alternative funding. These proceeds were realized by participating in drug investigations with federal law enforcement agencies. The county uses these proceeds to support programs, such as Crime Stoppers and a Sheriff's Community Advisory Board.<sup>6</sup>

### 3.1.3 Pros and Cons

#### Pros

- *No increase in existing taxes*

Asset forfeiture proceeds do not require creating or increasing an existing tax or fee.

- *Asset forfeiture proceeds can be directed toward public safety communications*

State and local governments may create asset forfeiture programs and direct proceeds toward public safety communications systems.

- *Excluded from budget revenue projections*

Funding from asset forfeitures is generally excluded from budget revenue projections, proceeds from the sale of seized assets are placed directly into a special fund.

#### Cons

- *Intense competition for funds*

Because asset forfeiture proceeds are generally associated with law enforcement activities, competition for these funds from other public safety agencies (e.g., fire and

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<sup>5</sup> Golsby, Marsanne, "Governor Foster Announces Proposals To Reform Drug Asset Forfeiture Process," April 30, 1997, Web site: <http://www.state.la.us/gov.pr043077.htm>.

<sup>6</sup> Van Wert, Carl E., "Drug Money Helps Supplement Waning Law Enforcement Budget," *Sheriff Times*, Spring 1996, Vol. 1, No. 1. Web site: <http://www.communitypolicing.org/shtimes/slvanswer.htm>.

emergency medical services) may be intense. Additionally, many jurisdictions use these proceeds to augment other non-public safety government services. Diverting funding away from these services may be difficult.

- *Forfeiture activity is not evenly distributed*

Asset forfeiture activity is not evenly distributed across the nation. Urban and large suburban areas generally benefit significantly from forfeiture activity as compared to rural areas of the country.

- *May not provide adequate revenue*

Asset forfeiture proceeds may not provide adequate revenue for the planning and design phase because proceeds are based on the level of criminal activity and the statutory provisions that allow the seizure of property. The unpredictable level of asset forfeiture proceeds could make it difficult to ensure that planning and design costs are covered.

## **3.2 Grants**

Grants are a mechanism through which governments, and in some cases private entities, receive funding from another government entity. Grants are typically used to fund research and development, education, infrastructure development, and transportation projects and to provide general fiscal assistance. Their objectives are to equalize the distribution and quality of public services and influence the nature and level of public services. The creation of a new grant is most likely when a government (local, state, and federal) interest is at stake. For example, the pressing need for interoperability among public safety communications systems may make a federal grant program an appropriate way to address this nationwide challenge.

Grants are classified as categorical or block. Categorical grants, also known as conditional grants, provide assistance for specific, narrowly defined purposes, usually limited to spending for certain activities. The specific requirements and limitations of a categorical grant are generally described in detail within the grant program's application package. Block grants, also referred to as unconditional grants, are usually distributed according to a statutory formula to finance activities in a broad program area.<sup>7</sup> Many grants require the requesting entity to supply some sort of match, usually a funding match but in some cases in-kind services are allowable.

### **3.2.1 Federal Grants Dedicated to Public Safety**

Federal grants provide targeted funding to advance nationwide goals and to assist in the equal distribution of government services. These grants are associated with many different government program areas, including education, transportation, and public safety. The Federal Government has created numerous grant programs specifically to promote criminal justice and

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<sup>7</sup> J. Richard Aronson and John L. Hillely, *Financing State and Local Governments*, The Brookings Institution, Washington, D.C., 1986.

public safety initiatives. The Community Oriented Policing Services (COPS) grant and Community Oriented Policing Services Making Officer Redeployment Effective (COPS MORE) grant, are two examples of federal grant programs directed toward state and local governments as part of the 1994 Anti-Crime Law. These grant programs enable state and local public safety agencies to hire additional law enforcement officers and provide necessary support services (e.g., telecommunications equipment, vehicles, and weapons). Although COPS and COPS MORE are not designed specifically to support public safety communications needs, they are useful models of grant programs that address the needs of one part of the public safety community (e.g., law enforcement).

The police department in Alexandria, Virginia is an example of a local law enforcement agency using a federal grant to improve public safety communications. From 1986 to 1989, the City received more than \$500,000 from the COPS MORE grant program. A portion of the grant proceeds paid for mobile data computers (MDCs) that use commercial data transmission services. Using MDCs and commercial data transmission services has helped reduce the radio traffic on the existing city-owned LMR infrastructure. The grants were awarded directly to Alexandria, and the city used its asset forfeiture proceeds for the required match of 25 percent.<sup>8</sup>

### **3.2.2 State Grants Dedicated to Public Safety**

States also develop grant programs to exert policy influence within the cities and counties of the state. As with federal grant programs, state grants generally require the completion of an application and may require a grant match. Many state grant programs are funded through state and federal fiscal resources. In some cases, it is more efficient for the Federal Government to delegate to the states the administration of federal grant funding. For example, some states use their portion of the federal highway trust fund proceeds to award grants to individual cities and towns in the state to advance federal and state transportation goals.

An example of a coordinated state grant program is the Maryland Governor's Office of Crime Control and Prevention (OCCP), which administers 11 federal and state criminal justice and law enforcement grant programs. OCCP also assists in developing legislation, policies, programs, and budgets aimed at reducing and preventing crime, violence, delinquency, and substance abuse. Its responsibilities include improving the administration of justice and addressing other public safety issues.<sup>9</sup> A specific example from OCCP is a state-funded safe neighborhood grant to allow certain public safety agencies to purchase gun trigger locks for private citizens.

### **3.2.3 Pros and Cons**

#### **Pros**

- *Flexibility to create programs*

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<sup>8</sup> Interview with Amy Long, City of Alexandria, Alexandria, Virginia, March 20, 1998.

<sup>9</sup> Governor's Office of Crime Control & Prevention, *Making Maryland's Communities Safe*, Annapolis, Maryland, Summer 1997.

Grant funds from the Federal Government could provide individual states and localities with the flexibility to create programs (e.g., support for public safety communications systems development) that are specific to agency requirements.

- *Advance policy goals and encourage coordination*

Grants administered on either the federal or state level can advance national and state goals and encourage the coordination of efforts at several levels of government.

### **Cons**

- *Elimination or shifting of resources*

Unless the grant is funded from a new source of revenue, the creation of a federal or state grant program would require eliminating or shifting resources from other areas within an agency or the government. These changes could create opposition to a grant program.

- *Administrative reporting requirements*

Many grants have requirements for reporting that may be too cumbersome or beyond the capabilities of some jurisdictions.

- *Competition for grant funding*

Distribution of grant funding is subject to competition from other jurisdictions and there is no guarantee of funding.

## 4.0 PROCUREMENT AND INSTALLATION




The procurement and installation phase of the systems development life cycle involves acquisition of equipment, as well as installation and testing of the LMR system. This phase of the life cycle is capital intensive, requiring a significant amount of funding within a relatively short period of time. While the planning and design phase usually does not involve the purchase of equipment, the procurement and installation phase requires significant funding to purchase portable and mobile radios, construct antenna towers, and install dispatching consoles. The magnitude of the procurement and installation costs, combined with the 8 to 10 year service life, warrant treating an LMR system as a capital asset. Since capital assets are usually financed over the system's life cycle, many governments finance these systems through capital appropriations, bond proceeds, or lease-purchase agreements.

A financing method is distinctly different from a funding strategy. The funding strategy is associated with the entire life cycle and may include several financing methods and funding sources. Furthermore, one financing method may include several funding sources. For example, a jurisdiction may choose to finance its system replacement with a lease purchase agreement over a seven year contract period, with the funding source being a combination of asset forfeiture proceeds and capital appropriations. Typical financing methods for public safety wireless communications systems include capital appropriations, bond proceeds, and lease-purchase agreements.

Capital appropriations, bond proceeds, and lease-purchase agreements represent only a few of the financing options that an agency may consider when it reaches the procurement and installation phase. However, regardless of the financing option selected, the jurisdiction must identify a revenue source to support the option (e.g., revenue to repay the bond principle and interest). To support the financing option selected, agencies may be able to use revenue sources listed in Figure 4-1.

Federal agencies differ from their state and local counterparts in that large-scale procurements are usually purchased outright, rather than being financed over an extended period of time. Procurements of this magnitude necessitate planning to ensure that funding is used efficiently and effectively. Thus, the Office of Management and Budget (OMB), in Circular A-11, requires federal agencies to submit a capital plan before making a financial commitment to large capital projects. A capital plan provides OMB with the information necessary to determine the feasibility and strategic value of acquiring capital assets, including information technology (IT) systems. Capital plans are a result of several federal laws enacted to improve federal government operations. The plans ensure that federal agencies consider all factors when investing in IT including: a disciplined approach to IT planning, establishing clear goals that can be measured, and demonstrating that the acquisition will support broad government wide efforts.

A capital plan is developed in the planning and design phase of the life cycle and submitted to OMB. Once OMB accepts the plan, a funding request is included in the President's budget submission to Congress. After Congress approves the associated appropriation bill, agencies may execute their capital plan.

	<b>Planning and Design</b>	<b>Procurement and Installation</b>	<b>Operations and Maintenance</b>
<b>Federal</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> </ul>	<ul style="list-style-type: none"> <li>• Annual Appropriations</li> <li>• Federal Excise Tax</li> <li>• Spectrum Lease Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> </ul>
<b>State</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> <li>• Federal Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Right-of-Way Fees</li> <li>• Utility Tax/ Surcharge Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> </ul>
<b>Local</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> <li>• Federal/State Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Right-of-Way Fees</li> <li>• Utility Tax/Surcharge Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> <li>• Impact Fees</li> </ul>

**Figure 4-1 Funding Sources Matrix—Procurement and Installation Phase**

In the event that there are insufficient existing fiscal resources to execute a capital plan, the following two revenue resources could be considered by the Federal Government to generate sufficient revenue to procure and install federal public safety LMR systems. These revenues would not be used as a pass-through to fund state or local public safety LMR replacement projects.

#### **4.1 Federal Excise Tax**

An excise tax, or consumption tax, is a sales tax levied on individuals or industries who use or consume specific goods and services. The revenue generated is usually earmarked for specific purposes related to that good or service. For example, revenue generated from the federal gasoline excise tax supports highway construction and maintenance.

Since 1934, the Federal Government has levied an excise tax on telecommunications usage. The current tax rate, 3 percent of telecommunications services, is reflected on local and long distance telephone bills. This rate has varied from a high of 10 percent before 1973 to a low of 1 percent in 1984. During fiscal year 1999, the telecommunications excise tax is expected to generate \$4.75 billion,<sup>10</sup> or approximately \$5 per household with telephone service. This

<sup>10</sup> *Budget of the United States Government*, Fiscal Year 1999.

represents the generation of \$1.58 billion in revenue for each 1 percent of tax. Revenue from the telecommunications excise tax is currently directed into the federal general fund and is not dedicated to the support of any specific federal program or service. An increase in the telecommunications excise tax could be approved by Congress, with the proceeds directed to the replacement of federal public safety communications systems.

#### **4.1.1 Pros and Cons**

##### **Pros**

- *Already an established excise tax*

The taxing authority is already well established and the rate has changed numerous times in the past.

- *Existing collection method*

The collection method is already in place with the long distance and local phone companies collecting the tax at the retail level and forwarding the revenue to the Federal Government.

- *Universal application*

Because the tax is based on telecommunications usage and applies to commercial and private telecommunication services, it is essentially universal in its application.

##### **Cons**

- *Potential tax payer confusion*

Dedicating a portion of the telecommunications excise tax revenue to replacement of federal public safety communications systems might create tax payer confusion. The public might incorrectly believe the entire excise tax amount reflected on their monthly phone bill is being directed to the replacement of federal public safety communications systems.

- *No correlation between amount paid and benefit received*

For a national excise tax whose revenue is directed to a specific purpose, no direct correlation usually exists between the amount of taxes paid by a geographic area or economic class and the amount of benefit received.

#### **4.1 Spectrum Lease Fees**

The 1993 Omnibus Reconciliation Act directed the Federal Communications Commission (FCC) to generate revenue by auctioning portions of available spectrum for commercial use. Before 1993, holders of frequency spectrum rights were not required to pay for the use of this public resource. They obtained a right to use the spectrum on a first-come, first-served basis by requesting a license from the FCC.

Frequency holders could be required to pay an annual license fee, with revenues directed for use in the replacement of federal public safety wireless communications systems. The concept of assessing license fees for the right of exclusive use of radio spectrum is well established in other countries such as Canada, Japan, New Zealand, and Australia. Additionally, the notion of paying for use of a public resource is already established in other areas of the Federal Government. Examples include royalty agreements for commercial mineral and oil exploration on public lands and grazing fees paid by ranchers who use public lands to graze their cattle.

#### **4.2.1 Pros and Cons**

##### **Pros**

- *Well established*

Paying for the right to exclusive use of a public resource is well established at the local, state, and federal levels of government.

- *Efficient collection*

The relatively limited number of commercial spectrum license holders, compared with the number of consumers using the frequency, would make it easier to administer the fee than to collect a broad consumer tax from individuals.

- *Ease of enforcement*

Collection of the fee would be reasonably easy to enforce because of the FCC's ability to revoke licenses.

##### **Cons**

- *Industry opposition*

The telecommunications industry may express considerable opposition to a spectrum lease fee.

- *Establishing new processes may be difficult*



Establishing a new revenue-generating process is much more difficult (politically and administratively) and more time consuming than modifying an existing revenue-generating process.

#### **4.1 Right-of-Way Fees**

In many states, the single largest landholder is the state itself, in large part because of state ownership of parks and roads. State property is frequently used by commercial enterprises in the delivery of their services. This often takes the form of utility easements in the public right-of-way on state roads.<sup>11</sup> In many states, utility companies and other commercial entities do not have to pay for using the public right-of-way. The passage of the Telecommunications Reform Act of 1996 (Telecom Act) cleared the way for state and local governments to assess a charge on telecommunications companies using the public right-of-way to deliver services.

Some states have already begun to exploit the opportunity to charge a fee for public right-of-way use. For example, in the Commonwealth of Virginia, the 1998 General Assembly passed a bill (House Bill 957) to create a fee to be assessed on telecommunications companies using the public right-of-way. As a result, a city such as Alexandria, with a population just over 100,000, is estimated to realize \$640,000 annually in additional revenue.<sup>12</sup> Other states and localities could either enact right-of-way fees or, if a fee is already in place, enhance the fee structure to provide revenue to finance public safety communications systems.

##### **4.3.1 Pros and Cons**

###### **Pros**

- *Collection of fees is efficient*

Unlike an excise on telecommunications services, which is levied on consumers directly, a right-of-way usage fee is charged entirely to the commercial enterprise using the right-of-way. Because of the limited number of telecommunications service providers in any given state, the administration and collection of a right-of-way usage fee is very efficient.

###### **Cons**

- *Changing technology may reduce or eliminate revenue generation*

Changing technologies may eliminate use of the public right-of-way by commercial enterprises. For example, the emergence of direct TV, which does not rely on the use of the public right-of-way, may ultimately eliminate the need for buried cable lines and thus decrease the potential of this revenue source.

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<sup>11</sup> "A public right-of-way is defined as... land, property, or interest therein, usually in a strip, acquired for or devoted to transportation purposes" Chapter 20, Virginia Administration Code 30-150-1120.

<sup>12</sup> Interview with Bernard Canton, Legislative Director for the City of Alexandria, Virginia, June 23, 1998.

- *Industry opposition*

Industry opposition would include not only the telecommunications service providers, but also water and electric companies, which rely on the public right-of-way to provide services.

#### **4.1 Utility Tax/Surcharge Fees**

Many state and local governments levy various forms of utility taxes. These taxes are usually based on levels of consumption of basic services, such as energy, telecommunications, and water. The utility tax on telecommunications levied by some state and local governments varies little from its federal counterpart, the telecommunications excise tax. State and local governments that do not currently have a utility tax on telecommunications use could implement a utility tax to provide funding for the procurement and installation phase of systems development.

A surcharge is similar to a utility or excise tax in that revenue is generated from consumption of a good or service. The difference is that a surcharge is usually a fixed amount, rather than a percentage or proportion of the charge for the amount consumed. It may be possible for local or state governments to implement a surcharge, on any consumable services or regulated products (telecommunications, water, electric, cable TV, or alcohol) to generate revenue for replacing or upgrading their LMR systems.

The State of Florida uses a surcharge to fund a statewide public safety radio communications system. Florida's system serves 12 agencies—including the Highway Patrol, the Game and Freshwater Fish Commission, the Bureau of Fire and Arson Investigation, the Department of Corrections, and the state university system. This system is expected to cost more than \$336 million when completed.<sup>13</sup> To fund this statewide system, the Florida legislature passed a bill (Statute 320.0802) that imposed a \$1 surcharge on every automobile and boat registration in the state from 1989 to 2003. Revenue generated from this surcharge is deposited in a state trust fund dedicated to paying for the construction of the statewide public safety communications system.<sup>14</sup>

##### **4.4.1 Pros and Cons**

###### **Pros**

- *Collection process is efficient*

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<sup>13</sup> Wayne, Debra, "FCC Thaws General Category Freeze for Florida Public Safety," *RCR*, August 11, 1997.

<sup>14</sup> Section 282.1095, *State Agency Law Enforcement Radio System*, State of Florida Statutes 1997.

The responsibility for administering and collecting utility taxes is left to commercial service providers, as is true of the federal excise tax. Thereby limiting the number of telecommunications providers operating within a state or locality.

### Cons

- *Taxpayer opposition*

Taxpayers may question the number of taxes/surcharges reflected on their utility bills, especially if the use of the revenue generated from the utility tax is not readily apparent.

- *Industry opposition*

If states or localities do not already levy a utility tax on telecommunications use, industry opposition may make it difficult to establish a utility tax.

- *Insufficient revenue generation*

Revenue generated from utility taxes or surcharges may not be adequate to cover the implementation costs, therefore, a surcharge may need to be used in combination with other funding sources.

## 5.0 OPERATIONS AND MAINTENANCE

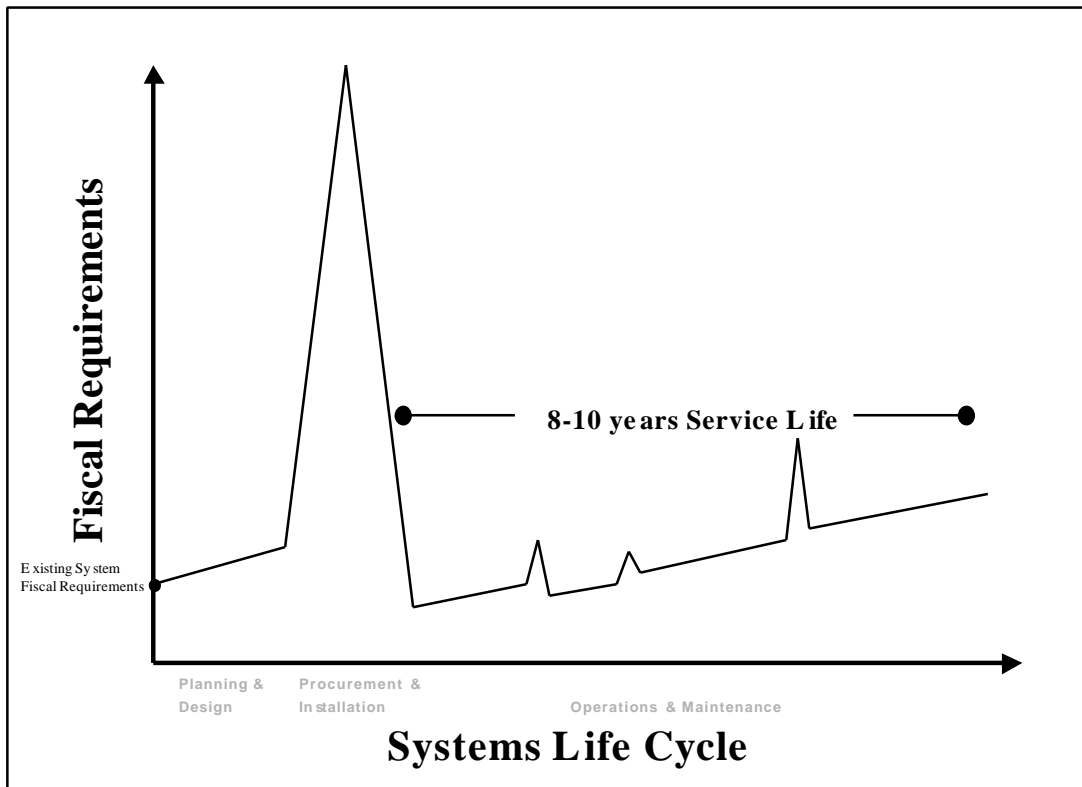
The operations and maintenance phase of the systems development life cycle involves the day-to-day functioning of the LMR system. The activities in this phase ensure that the system is functioning properly and meeting the needs of public safety agencies. It is anticipated that the funding sources currently being used to finance operations and maintenance of existing systems will continue to be dedicated for this purpose for new or upgraded systems. However, the cost of operating and maintaining a new or upgraded system could fluctuate based on several variables. Some cost savings may be realized through:

- The elimination of third party vendors previously required to support existing systems coupled with warranties offered with new equipment
- The availability and affordability of replacement parts
- The reduction in system downtime due to system malfunction.

These cost savings may be offset by increased costs associated with:

- Modern LMR systems being heavily supported by computers, which require a higher level of maintenance than existing LMR systems
- Staff training and education
- Many public safety agencies procuring systems that operate in the 800 Mhz frequency band. Systems operating in this band require more antenna sites, which must be maintained and secured, than legacy systems that may have operated in lower frequency bands.

Although it is anticipated that existing revenue sources will provide for the operations and maintenance of new or upgraded systems, public safety agencies should prepare for the occurrence of periodic spikes in future funding requirements. These spikes, illustrated in figure 5-1, result from the unanticipated replacement of major component parts or the upgrade of end-user equipment (i.e., portable and mobile radios). Public safety agencies can mitigate the effects of these funding fluctuations by establishing a capitalization or sinking fund.






**Figure 5-1 Systems Life Cycle Fiscal Requirements**

A sinking fund is a repository for revenue dedicated to replacing or upgrading a capital asset or, in some cases, major components of the capital asset. Many jurisdictions have already established such sinking funds for the replacement of capital assets associated with public safety (e.g., vehicles) and some jurisdictions have dedicated sinking funds for LMR equipment. One such jurisdiction is Humboldt County, California. Each year, the county budgets for a contribution to a special fund that is dedicated to the replacement of LMR equipment. This contribution is reflected on a prorated formula, based on system usage, within the annual budget of each of the county agencies that use the LMR system.<sup>15</sup>

The matrix in Figure 5-2 highlights some potential sources of revenue that could be dedicated to this fund.

<sup>15</sup> Humboldt City Auditors Office, Humboldt County, California, June 23, 1998.

	<b>Planning and Design</b>	<b>Procurement and Installation</b>	<b>Operations and Maintenance</b>
<b>Federal</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> </ul>	<ul style="list-style-type: none"> <li>• Annual Appropriations</li> <li>• Federal Excise Tax</li> <li>• Spectrum Lease Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> </ul>
<b>State</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> <li>• Federal Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Right-of-Way Fees</li> <li>• Utility Tax/ Surcharge Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> </ul>
<b>Local</b> 	<ul style="list-style-type: none"> <li>• Redirect Existing Financial Resources</li> <li>• Asset Forfeiture</li> <li>• Federal/State Grants</li> </ul>	<ul style="list-style-type: none"> <li>• Right-of-Way Fees</li> <li>• Utility Tax/Surcharge Fees</li> </ul>	<ul style="list-style-type: none"> <li>• Existing Financial Resources</li> <li>• Tower Space Leasing</li> <li>• Impact Fees</li> </ul>

**Figure 5-2 Funding Sources Matrix—Operations and Maintenance Phase**

### 5.1 Tower Space Leasing

Because of the rapid expansion of the wireless communications industry, tower and antenna siting is becoming an increasingly important issue. Many wireless service providers seeking to build out their systems are hindered by an inability to secure adequate space to erect towers and antennas. Debate over this issue has been increasing since the passage of the Telecom Act, which was designed to foster competition in the telephone industry and allow many new competitors into the wireless market—competitors who need towers. The cellular telephone industry alone will need up to 125,000 towers to build out the systems authorized by the FCC.<sup>16</sup>

In 1995, President Clinton issued a memorandum entitled “Facilitating Access to Federal Property for the Siting of Mobile Services Antennas” directing the Administrator of the General Services Administration (GSA), in consultation with other federal agency heads, to develop procedures to facilitate access to federal property for commercial mobile service antenna sites.<sup>17</sup> Further, the memorandum authorized federal agencies to charge fees based on market value for siting antennas on federal property and to use competitive procedures to determine the fees. In 1996, the President signed the Telecom Act that included provisions concerning the placement of towers and other facilities to support personal wireless services. Specifically, Section 704 of the 1996 Act requires the Federal Government to take steps to help licensees in spectrum-based services such as PCS, cellular, and

<sup>16</sup> “It’s a Control Thing: Vermont Vs. Cell Phone Towers,” *The New York Times*, Wednesday, March 11, 1998.

<sup>17</sup> “Facilitating Access to Federal Property for the Siting of Mobile Services Antennas,” Presidential Memorandum, August 10, 1995.

specialized land mobile radio (SLMR) receive access to preferred sites for their facilities.<sup>18</sup> Federal agencies and departments are directed to work with licensees to make federal property available for this purpose, and the FCC is directed to work with the states to find ways for states to accommodate licensees that wish to build towers on state property or use state easements or rights-of-way. The Telecom Act authorizes government agencies to charge reasonable fees for antenna sites on federal property, and the President's memorandum directs Executive Branch departments and agencies to charge fees based on market value.

State and local governments are also taking advantage of the opportunity generate revenue from leasing tower and antenna space on land and buildings owned by state and local governments. One such example is the Ohio Department of Transportation (ODOT). ODOT is embarking on a public/private partnership for strategic tower placement that will raise millions of dollars for Ohio's transportation system.<sup>19</sup> Given the increased demand for tower sites and the vigorous debate surrounding where to erect them, the private and public sectors have a common interest in placing towers on ODOT rights-of-way. Such arrangements do not require a large investment for ODOT to erect towers for their own use because they can use towers erected by commercial enterprise and the lease agreements on stated owned land where these towers are placed could generate revenues estimated between \$1,000 and \$2,000 per month per site. Over 10 years, 1,000 towers could yield an average of \$25 million per year. Furthermore, the state anticipates a possible \$25 million in savings if antennas for the new statewide radio communications system are added to the towers. Ohio's Multi-Agency Radio Communication System is a \$175 million system to be used by the State Highway Patrol and 13 other state agencies, including ODOT. Each antenna site will cost approximately \$225,000, the amount that could be saved if some of the antennas were mounted on towers in ODOT rights-of-way.

### 5.1.1 Pros and Cons

#### Pros

- *Significant revenue generation*

At the state and local level, leasing government-owned land and buildings to commercial mobile communications companies could generate substantial revenue.

- *Cost savings for government communications systems*

State and local governments could realize significant savings associated with tower and antenna site rental by using commercial towers that have been erected on government-owned property. This allows governments to avoid erecting towers for their own communications systems.

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<sup>18</sup> Telecommunications Act of 1996, Public Law No. 104-104, 110 Statute 56 (1996).

<sup>19</sup> Information in this paragraph drawn from "ODOT Lease Agreement May Generate Millions," *Newswire & Weather*, Web site: <http://www.dot.state.oh.us>.

## Cons

- *Public opposition against additional antennas*

Antenna and tower siting is a highly contentious issue because of potential reductions in the resale value of homes and interference with radio, television, and electrical devices.

- *Government-owned land must meet technical requirements*

Use of government-owned land is not always an alternative to placing towers on privately-owned land because government-owned land can be used only if it meets certain technical specifications and is cost effective.

- *Restricted access to government property for security reasons*

Government agencies, especially public safety, defense, and national security agencies may oppose the use of certain government-owned land for placement of commercial towers or antennas due to concerns about security.

- *Additional revenue offset by increased antenna site costs for government agencies*

The same technologies that require additional antenna sites in the commercial sector will be employed by public safety agencies as they replace their legacy systems. Therefore, public safety agencies may experience the same increase in site lease costs as the commercial sector when agencies are forced to use commercial sites for their public safety communications antennas when government sites are not available or technically viable.

- *Reluctance to charge for use of government owned property*

At the federal level, there is evidence of noncompliance with Section 704 of the 1996 Act by several government agencies, due in part to there being little incentive for them to cooperate.<sup>20</sup> Unless the assessing agency has independent statutory authority to retain the monetary proceeds from leasing arrangements, any fees collected are deposited into the U.S. Treasury as a miscellaneous receipt or into GSA's Federal Building Fund.<sup>21</sup> Legislation would be necessary before any funds generated from leased tower sites on federal lands could be earmarked for specific projects.

## **5.2 Impact Fees**

To avoid raising the rates of highly visible taxes, such as those levied on property and income, some local governments have employed impact fees to generate additional revenue. Impact fees

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<sup>20</sup> Interview with David Diggs, Cellular Telecommunications Industry Association.

<sup>21</sup> "General Services Administration: Public Building and Space," GSA Bulletin FPRM D-246. Federal Register, Vol.63, No. 42, Wednesday, March 4, 1998.



typically take the form of a one-time charge per residential unit or per square foot for commercial development and are paid by land developers. These fees are implemented to provide revenue for establishing public infrastructures associated with land development (sanitary sewers, parks, schools, fire stations, etc.). In Prescott, Arizona, for example, the impact fee for each new residential unit constructed is \$1,740.<sup>22</sup> This fee is collected as part of a permit fee for new home construction.

Some local governments, however, employ a recurring impact fee. An example of such a fee is in Prince William County, Virginia, where a yearly impact fee of \$18 per single-family home and \$13.50 per apartment or townhome is charged to provide revenue for stormwater management initiatives.<sup>23</sup> To provide revenue for public safety communications systems, an annual impact fee could be levied based on the number of telephone lines at each address.

### 5.2.1 Pros and Cons

#### Pros

- *Affects a small segment of the population*

Impact fees associated with land development are paid by a small number of developers, who in turn pass these fees on to new homebuyers or new commercial property owners. Thus, public opposition to these fees is mitigated because the fees affect only a small segment of the population.

- *Efficient fee collection*

The collection of one-time or recurring impact fees can be quite efficient when they are incorporated into existing occupancy permit requirements or local property tax bills.

#### Cons

- *Volatile and unpredictable revenue source*

Revenue from one-time impact fees based on land development can be volatile because of economic changes. In communities where new construction is limited, one-time impact fees based on land development may provide insufficient revenue.

- *Public opposition to additional fees*

The implementation of new recurring impact fees could prompt public opposition.

- *Equity Concerns*

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<sup>22</sup> Interview with Sally Rogers, Building Department, City of Prescott, Prescott, Arizona, July 7, 1998.

<sup>23</sup> Interview with John White, Watershed Management Branch, Environmental Services Division, Department of Public Works, Prince William County, Virginia, July 7, 1998.

Impact fees based solely on land development only are applied to a small segment of the population, but the benefits of improved public safety communications are shared by all. Impact fees developed to generate revenue for public safety communications systems should be structured similar to an annual impact fee to ensure equity.

## 6.0 ALTERNATIVE APPROACHES TO IMPROVED PUBLIC SAFETY COMMUNICATIONS

The information provided in the previous sections has identified possible revenue sources to assist agencies in developing funding strategies to replace their radio communications systems. Because some jurisdictions may not be able to use any of the revenue sources noted so far, this section suggests alternative approaches to improve public safety communications, including multi-jurisdictional partnerships, public/private partnerships, and purely commercial arrangements. The information provided outlines only a few of the many kinds of partnerships that could be established.

### 6.1 Multi-Jurisdictional

Many public safety agencies at all levels of government currently use shared systems and resources as an alternative to building independent systems. Sharing systems with other public safety agencies or governmental entities typically increases political and public support because this approach uses limited funding efficiently by leveraging economies of scale.

Leveraging economies of scale reduces the cost to each participant of developing and using LMR systems. Shared systems can take many forms,<sup>24</sup> including systems shared by different levels of government (local, state, and federal); systems shared by several jurisdictions at the same level of government (e.g., one system supporting several counties, cities, or towns); and systems shared by multiple agencies within one jurisdiction (e.g., one city system supporting many municipal agencies such as police, fire, EMS, and public works). The terms of these partnerships vary, depending on what each party contributes to the overall success of the system.

Shared systems are typically developed as planned implementations. The respective government agencies or jurisdictions come together politically and administratively to implement these systems. The management and control of these systems is typically similar to the management and control of other multi-agency or regional government services, with each agency or jurisdiction having representation for the oversight of the system. This representation can take the form of equal representation for all parties, or can be prorated by relative population size, tax base, geographic area, or the number of users accessing the system.

Financing the implementation and operation of a shared system is usually established concurrently with determining the relative representation for the management and oversight of the system. Financing the implementation costs of these systems is typically proportional to population or percent of the system infrastructure dedicated to each agency. The financing of the operations and maintenance costs of shared systems is generally based on the number of personnel using the system, the number of pieces of equipment accessing the system, or the actual system usage (airtime).

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<sup>24</sup> *Multi-Jurisdictional/Multi-Discipline Public Safety Communications Systems*, Public Safety Wireless Network (PSWN) Symposium, Harrisburg, Pennsylvania, November 19-20, 1997.

## 6.1.1 Pros and Cons

### Pros

- *Cost and risk sharing*

The cost and risk of systems planning and design, procurement and installation, and system operations and maintenance is spread among the participating agencies.

- *Mitigating redundant infrastructures*

Shared systems reduce duplicative infrastructure, providing for the efficient use of radio spectrum and other public resources.

- *Improved system fiscal stability*

Shared systems, backed by legally binding inter-jurisdictional agreements, help ensure that the system's continued fiscal requirements are met.

- *Leveling of the communications technical capability within a region*

Shared systems help ensure that all agencies, regardless of size, location, and budget provide the same level of communications technical capabilities for the entire geographic region covered by the system.

- *Improved communications interoperability*

Shared system improve communications interoperability between public safety agencies because the system uses a single architecture, thus avoiding interoperability problems caused by differing manufacturer equipment, frequencies, and systems management.

### Cons

- *Difficulty in attaining political and administrative consensus*

Political and administrative consensus may be difficult to achieve when first organizing a shared system. Some jurisdictions may not be amenable to partnering with other jurisdictions having fewer resources to offer. Additionally, changes in the system operation, technical capabilities, and system management may be difficult to enact with a large number of participating jurisdictions.

- *Geographic limitations*

Geographic considerations may preclude some jurisdictions from joining a shared system. For example, physical boundaries and insufficient population density may make the use of shared systems impractical.

- *Differing operational requirements*

Operational system requirements may vary among partnering jurisdictions. These requirements may result in some jurisdictions not participating in a shared system because of a lack of perceived need. Additionally, the operational requirements of some jurisdictions may not be fully realized because of a desire to participate in a shared system.

## **6.2 Public/Private Partnerships**

Recently, public service providers have been finding ways to cooperate with the private sector to improve service efficiency. These arrangements typically involve a partnership between a public agency or jurisdiction and a private entity. Public/private partnerships can be mutually beneficial.

One public/private partnership involving a public safety agency exists between the South Carolina Electric and Gas Company—a division of SCANA, Inc.—and local jurisdictions in the State of South Carolina. SCANA built an 800 MHz system that it shares with local jurisdictions on a nonprofit basis.<sup>25</sup> The system allows officers of agencies like the Department of Public Safety to operate as members of their own talk group on county systems. As part of the arrangement, each jurisdiction provides its own equipment and pays SCANA a monthly management fee for the services. Participating state agencies, primarily representing law enforcement, receive funding for this program from the state's general fund. County jurisdictions and agencies wishing to operate on the system are responsible for identifying their own revenue sources, because there is no subsidy from the state. The system currently covers approximately 60 percent of the state, and growth continues as local jurisdictions identify revenue sources. The state has no plans to build a state owned system. Therefore, this partnership is expected to be the primary provider of service for the foreseeable future.

### **6.2.1 Pros and Cons**

#### **Pros**

- *Avoiding significant initial capital investment*

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<sup>25</sup> Interview with George Crouch, SCANA, Inc., July 9, 1998.

A partnership with a private company may relieve public agencies from having to make large, up-front capital investments when replacing or upgrading their existing LMR systems.

- *Private enterprise has the ability to supply additional capital*

Because a state or local government may have difficulty raising the necessary fiscal resources to replace or upgrade their communications systems, partnering with private enterprises provides additional access to capital.

- *System management flexibility*

Because of government personnel, budget, and procurement procedures, private enterprises have traditionally been more flexible in their ability to change staffing levels and to procure equipment and services under short time frames.

## **Cons**

- *Costs associated with contract negotiation and management*

Partnerships may require governments to expend considerable resources—both financial resources and staff time—in evaluating and negotiating agreements and in monitoring performance.

- *Lack of system security*

Private networks may not provide adequate security measures for government operations, especially law enforcement, judicial administration (courts), or correctional operations.

- *Lack of priority access*

Public safety agencies may be concerned about receiving priority access to the system during emergency situations. Without priority access, the personal safety of public responders may be jeopardized.

- *Fiscal stability of the private enterprise*

Economic and market forces could adversely affect a private enterprise thereby jeopardizing the ability of public safety agencies or jurisdictions to provide their services.

## **6.3 Commercial Services**

The proliferation of commercial wireless communications services nationwide may provide public safety agencies an alternative to building their own communications systems. Many public safety agencies are turning to commercial services to provide non-mission critical

communications, such as paging, cellular, and data transmission. Additionally, some jurisdictions have turned to commercial service to provide all of their wireless communications needs. If commercial services meet the mission requirements (system security, coverage, and priority access) of public safety agencies, this approach allows jurisdictions to avoid the financing and construction of an independent, government-owned LMR system. Furthermore, operation and maintenance of the system is the responsibility of the commercial service provider.

Small jurisdictions and budget-strapped agencies are more likely than others to benefit from commercial arrangements. In Black Hawk County, Iowa, for example, the use of a commercial SLMR system has saved the county approximately \$3 million. Each radio used is charged a \$15 per month usage fee for unlimited airtime. This solution has provided efficiencies and considerable cost savings while spreading service benefits across the county.<sup>26</sup>

### **6.3.1 Pros and Cons**

#### **Pros**

- *Avoiding significant initial capital investment*

Using commercial services relieve public agencies from having to make large, up-front capital investments when replacing or upgrading their existing LMR systems.

- *Improved access to emerging technologies*

An arrangement with a commercial enterprise may provide public safety agencies the opportunity to take advantage of emerging communications technologies more rapidly than traditional government information technology implementation.

#### **Cons**

- *Lack of system security*

Private networks may not provide adequate system security for law enforcement, judicial administration (courts), and correctional operations.

- *Lack of priority access*

Public safety agencies may be concerned about receiving priority access to the system during emergency situations. Without priority access, the personal safety of public responders may be jeopardized.

- *Fiscal stability of the private enterprise*

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<sup>26</sup> *Multi-Jurisdictional/Multi-Discipline Public Safety Communications Systems*, Public Safety Wireless Network (PSWN) Symposium,, Sacramento, California, March 3-5, 1998.

Economic and market forces could adversely affect a private enterprise thereby jeopardizing the ability of public safety agencies or jurisdictions to provide services.



## 7.0 CONCLUSION

Development of a funding strategy for the replacement or upgrade of public safety wireless communications systems is important to ensure fiscal requirements are anticipated and funding sources identified over the complete system life cycle. This report builds on the funding sources information gathered for its predecessor, the *PSWN Report on Funding Mechanisms for Public Safety Radio Communications*. The present report uses the information in that report to identify potential funding sources appropriate for each phase of the systems development life cycle and each level of government. These funding sources can be combined to form a funding strategy that covers the entire life cycle of the LMR system. They can also be customized to meet the individual needs and fiscal resources of each public safety agency.

It is important to note that no matter what combination of funding sources is used, each agency must develop a funding strategy that provides sufficient revenue to support each stage of the systems development life cycle. Thus, agencies need to be mindful that securing consistent and sustainable revenue is an inclusive process. Key stakeholders such as senior-level government officials, budget directors, political representatives, and the public need to be involved in all aspects of the LMR systems development. Most important, these stakeholders must be included from the planning stages of the project—where the funding strategy is developed.

The ability to secure the necessary funding to finance projects of this magnitude is one of the greatest challenges facing public safety agencies. This report is offered to help public safety agencies address this common challenge. It is presented with the hope that the ideas and information it contains will help the public safety community plan and develop its communications systems.

## **APPENDIX A ABBREVIATIONS AND ACRONYMS**

COPS	Community Oriented Policing Services
COPS MORE	Community Oriented Policing Services Making Officer Redeployment Effective
DOJ	Department of Justice
FCC	Federal Communications Commission
GSA	General Services Administration
IT	Information Technology
kHz	Kilohertz
LMR	Land Mobile Radio
MDC	Mobile Data Computer
MHz	Megahertz
NTIA	National Telecommunication and Information Administration
NPR	National Performance Review
OCCP	Office of Crime Control and Prevention
ODOT	Ohio Department of Transportation
OMB	Office of Management and Budget
PCS	Personal Communications Services
PSWN	Public Safety Wireless Network
SLMR	Specialized Land Mobile Radio
Telecom Act	Telecommunications Act of 1996