

# Next Generation 9-1-1 Funding Study

*submitted to*

**The Washington State Military Department**

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## 1. EXECUTIVE SUMMARY

L. Robert Kimball & Associates, Inc. (Kimball) is pleased to provide the Washington State Military Department with its Next Generation 9-1-1 (NG9-1-1) funding study report.

### 1.1 PURPOSE OF THE STUDY

The 2008 Legislature asked the Military Department's E9-1-1 Program Office to recommend an appropriate funding mechanism for the implementation of Next Generation 9-1-1. In response, the Military Department issued a Request for Proposals (RFP) and engaged Kimball to conduct a study to make recommendations for a funding mechanism that would address the costs of transitioning to NG9-1-1, and ongoing operations and maintenance of NG9-1-1 once implemented.

NG9-1-1 is a dramatic change in 9-1-1 technologies—from decades-old analog technology to modern, digital Internet Protocol (IP) technology—that will have an impact on virtually every aspect of 9-1-1 operations. The interactions between technology and funding mechanisms are complex, and a sound analysis required first understanding the total current cost of 9-1-1 operations in Washington State. The recommendations and alternatives presented in this report were developed from that analytical foundation.

New communications technologies enable people to send and receive text messages, photographs and streaming videos with handheld “devices;” these technologies use IP to transmit the data. Telematics systems like OnStar™ can automatically report motor vehicle accidents, and even provide information on the accident, to include possible injuries to the vehicle's occupants. None of these technologies has access to the current E9-1-1 system. NG9-1-1 uses IP, which has the potential to permit 9-1-1 call takers to process text messages, photographs, video and telematics data in addition to the landline and cellular calls processed today.

Currently, Enhanced 9-1-1 (E9-1-1) in Washington is funded by a state excise tax (20 cents per switched access line<sup>1</sup> and radio access line<sup>2</sup>) and a county excise tax (50 cents per switched access line and radio access line). The enhanced 9-1-1 tax rate set in Chapter 82.14B Revised Code of Washington (RCW) has been unchanged since it went into effect in 1992.

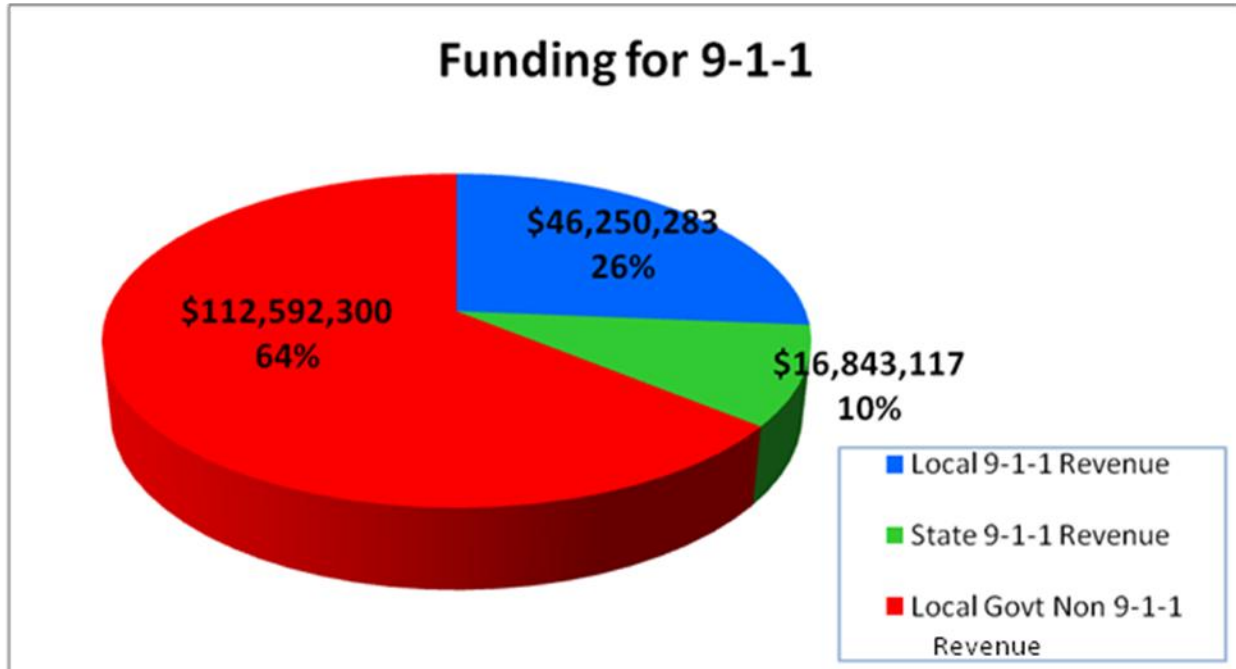
The combined state and local E9-1-1 taxes only cover \$63 million, or 36 percent, of the costs of providing E9-1-1 service throughout the state. Nearly \$113 million, or 64 percent, of the total cost of providing 9-1-1 services is made up at the local level through the use of county general funds and/or user fees

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<sup>1</sup> A switched access line is defined in RCW 82.14B.020 (3) to mean, “the telephone service line which connects a subscriber's main telephone(s) or equivalent main telephone(s) to the local exchange company's switching office.”

<sup>2</sup> A radio access line is defined in RCW 82.14B.020 (5) to mean, “the telephone number assigned to or used by a subscriber for two-way local wireless voice service available to the public for hire from a radio communications service company. Radio access lines include, but are not limited to, radio-telephone communications lines used in cellular telephone service, personal communications services, and network radio access lines, or their functional and competitive equivalent. Radio access lines do not include lines that provide access to one-way signaling service, such as paging service, or to communications channels suitable only for data transmission, or to nonlocal radio access line service, such as wireless roaming service, or to a private telecommunications system.

charged to local police departments, fire departments, etc. The breakout of the total support for current E9-1-1 operations is shown in the figure below.



**Figure 1**

Washington's E9-1-1 system has served the public extraordinarily well for many years. This can be attributed to the leadership, support and funding provided by the Washington E9-1-1 program office (E9-1-1 Program Office), and by the dedication and professionalism of the county 9-1-1 programs. A state E9-1-1 Advisory Committee (Committee) provides policy and planning support to the state program office. A NG9-1-1 subcommittee developed a Six-Year Plan, which accurately identified the most pressing issues facing the state of Washington's E9-1-1 system, and clearly made the connection between addressing the issues (or failing to address them) and the capability of the system to meet the public's expectations for service in the face of rapid technological change.

Current issues identified in the Six-Year Plan include:

1. Technology has changed, giving the public more communication options than just telephone calls. Some of these new communication options do not pay the 9-1-1 excise tax, which has a negative impact on current and future funding.
2. The state's current E9-1-1 system is unable to serve the people using some of these new technologies, a situation that will only get worse in the face of the relentless advance of technology. This will eventually erode the public's faith in the system.
3. Inflation has decreased the value of state and local 9-1-1 revenues by approximately 34 percent, according to the Washington State Economic and Revenue Forecast Council's estimates for the period from 1995 through 2006 (see <http://www.erfc.wa.gov/pubs/sep08pub.pdf>, page 96).

## **1.2 METHODS**

Kimball worked with the Washington State E9-1-1 Program Office's staff and key state, county and industry stakeholders to gather information necessary for the study. We obtained copies of county contracts and audits, revenue and cost information relating to the state and county 9-1-1 excise tax; current legislation, administrative rules and policies; statistical economic data and a variety of documents and reports containing essential information. We participated in a series of stakeholder meetings that the E9-1-1 Program Office hosted on October 7, 2008. Finally, we utilized cost information from the responses to the state's RFP for a statewide Emergency Services IP network (ESInet) to understand more precisely what NG9-1-1 would cost.

Kimball compiled all financial information into a series of spreadsheets to facilitate analysis and drew heavily upon the industry experience and knowledge of our project team to interpret the data and draw conclusions.

Kimball built an excise tax calculator to determine the tax rate needed to fully fund current costs, NG9-1-1 transition costs and NG9-1-1 ongoing operations and maintenance costs. The calculator used two options: the current funding mechanism (tax on switched access landlines and radio access lines) and the recommended funding mechanism (tax on switched access landlines, radio access lines, Voice over IP, and any other telecommunications service that enables a caller to make contact with the E9-1-1 system). The calculator enabled us to identify the maximum tax rate needed to fund 9-1-1 through 2016. The recommendation for a 9-1-1 tax maximum authorization was based on a simple calculation: add the excise tax calculations for each of the eight years from Fiscal Year 2009 through Fiscal Year 2016, divide the total by eight to determine the average tax rate. Then, round up the average to the nearest five-cent increment.

Kimball conducted a thorough review of Chapter 82.14B RCW and the E9-1-1 Program Office's Administrative Code. In consultation with the E9-1-1 Program Office's staff and drawing upon the industry experience and expertise of its project team, Kimball developed recommendations for legislation. We used Washington's legislative drafting conventions, understanding that the Advisory Committee will work with its legislative liaisons to draft the precise language that will ultimately become a bill for the legislature's consideration. We note for the record that Kimball does not provide legal advice, and our recommendations should be reviewed by the State's legal counsel.

## **1.3 ASSUMPTIONS**

Kimball assumed all information provided by the state and counties was correct. We assumed an average annual rate of inflation of 2.12 percent. Due to the short timeframe for the project, which made it impossible to conduct a thorough study of other potential non-traditional funding mechanisms, we assumed that the basic approach of assessing a 9-1-1 excise tax on telecommunications services would remain in place.

The estimated one-time, capital cost to transition to NG9-1-1 is \$23.8 million; additionally, \$34.9 million in NG9-1-1 recurring costs is estimated over the three-year transition period. The total NG9-1-1 transition costs would be \$58.7 million. Upon full implementation of NG9-1-1, the estimated recurring operational costs drop to \$14.2 million per year when current E9-1-1 system components are expected to be decommissioned.

## 1.4 RECOMMENDATIONS

Kimball identified three potential funding mechanisms to implement and transition to NG9-1-1.

One course of action would be for the Legislature to fund the \$58.7 million in transition costs from a source other than the Enhanced 9-1-1 account, and to maintain the current 9-1-1 excise tax structure except to modify legislation to assure that all potential technologies capable of calling 9-1-1 are taxed at the established rates. As previously noted, the \$58.7 million in transition costs is the sum of \$23.8 million in NG9-1-1 capital costs plus \$34.9 million in NG9-1-1 recurring costs required through the transition period. This has some risk in that the exact number of the devices not currently paying the tax can only be estimated. This also assumes that the implementation of NG9-1-1 would be closely coordinated to keep the transition period (in which both the current and the new systems would be operating in parallel) to a minimum. This course of action would not offset any of the costs currently paid for out of local general funds or user fees.

Assuming the law is modified to embrace all potential technologies capable of calling 9-1-1, a second course of action would be to fund the incremental costs of NG9-1-1 using tax revenue generated from an increase in the current state and local excise tax rate charged on devices. To fully fund one-time capital costs, transitional costs, and future operational costs, the current state excise tax would need to be raised from 20 cents per device per month to 25 cents per device per month at the state level and from 50 cents/device/month to 65 cents/device/month at the county level. Based on the projected NG9-1-1 costs, we estimate these tax maximums will generate enough revenue to fund the incremental costs of the NG9-1-1 transition and ongoing NG9-1-1 system operations, as well as support current E9-1-1 costs at the same level the excise tax does today. These figures constitute a recommendation for the establishment of a maximum tax authorization in the interest of not returning to the legislature every year. This course of action would not offset any of the costs currently paid for out of local general funds or user fees.

A third course of action would be to fully fund all state and local 9-1-1 costs historically associated with 9-1-1 operations from the 9-1-1 excise taxes. Local 9-1-1 officials and stakeholders have expressed support for such a concept, because, as stated previously, local governments currently contribute nearly 64 percent of the costs to maintain 9-1-1 systems from other funding sources, such as their general fund and user fees. Fully funding current E9-1-1 costs as well as the incremental costs to transition to NG9-1-1 would require the state and local 9-1-1 excise tax to be assessed on all devices capable of calling 9-1-1 *and* to be raised from 20 cents per device per month to 25 cents per device per month, and from 50 cents per device per month to \$1.75 per device per month respectively. Based on the projected costs, it is estimated that these tax maximums will generate enough revenue to fully fund current E9-1-1 costs borne by local government, incremental NG9-1-1 transition costs (both recurring and non-recurring) and ongoing NG9-1-1 system operations upon full implementation.

Kimball makes a minimum number of additional recommendations.

- Amend Chapter 82.14B RCW to apply to the estimated 92,491 Washington households with any type of VoIP service. If all VoIP users were to pay the E9-1-1 excise tax at the existing maximum excise tax rates, counties would raise an additional estimated \$554,946 per year, and the state would raise an additional estimated \$221,978 per year.
- Add six new definitions in Chapter 82.14B RCW in an effort to modernize and broaden the language to which the excise tax applies.

- Re-enforce the collection of the 9-1-1 excise tax from prepaid wireless users. We estimate prepaid wireless subscribers would contribute \$1,523,846 per year to the State, and \$3,809,616 per year to the counties at the current 9-1-1 tax rate.

The purpose of these recommendations is to apply the E9-1-1 excise tax in a technologically neutral manner on all current and future devices and services that users reasonably expect should provide them with access to 9-1-1, and to fund the technological migration necessary to make that happen.

## **1.5 ABOUT KIMBALL**

Kimball is one of the nation's largest engineering/architectural firms, annually ranked among the top 200 A/E firms by the Engineering News Record. We are a multidisciplinary firm with full in-house design services and a staff of more than 500 people to serve any client need, providing Telecommunications and Technology Consulting and Engineering, Architecture, Engineering and Environmental Science services. Kimball has managed over 200,000 projects across the country, ranging from \$1,000 to \$300,000,000.

Kimball's Telecommunications and Technology Division began offering public safety consulting services in 1990. Its staff is comprised of seasoned professionals with expertise in communication system planning and design, telecommunications and public safety technology, public policy (legislative and regulatory), 9-1-1 planning and funding. The individuals assigned to this study have been "in the trenches" managing and operating 9-1-1 programs at the state and local levels, and have helped numerous state-level clients to analyze 9-1-1 funding, and develop legislation and public policy, including Maine, Pennsylvania, Delaware, Tennessee and Missouri. In addition to state-level experience, our state of Washington team has been intimately involved in the U.S. Department of Transportation's NG9-1-1 project, thus providing the state of Washington with the benefit of their insight into the federal 9-1-1 policy environment that will have an impact on NG9-1-1 implementations nationwide.

Our unique position in the industry allows us to take a broad view of industry trends, vendor direction and vendor pricing, as well as policy development trends all across the country. Kimball used this experience to provide reality and credibility to our work on behalf of the state of Washington.

## **1.6 ACKNOWLEDGEMENTS**

We gratefully acknowledge the support, information and assistance we received from the E9-1-1 Program Office's staff, the E9-1-1 Advisory Committee and its NG9-1-1 subcommittee, the Department of Revenue (DOR), the Office of Financial Management (OFM), the Utility and Transportation Commission, representatives from the telecommunications service companies in the state of Washington and the County 9-1-1 Coordinators. It was our pleasure to work alongside them to assure the project's success.

## 2. INTRODUCTION

The future funding of Washington's E9-1-1 system is the most critical issue identified by the state 9-1-1 program office and county 9-1-1 coordinators. Working with the support of the Washington State chapters of the National Emergency Number Association (NENA) and the Association of Public-Safety Communications Officials (APCO), these stakeholders convinced the legislature of the importance of the issue. The 2008 legislature responded through the supplemental budget by providing for a 9-1-1 revenue study to be conducted and a report to be delivered to the Military Department's legislative oversight committees by December 1, 2008.

### 2.1 BACKGROUND

In 1991, a voter referendum was held in the state of Washington that established the E9-1-1 Program Office within the Emergency Management Division of the Military Department. The referendum also provided a funding mechanism for the program. The E9-1-1 Program Office was made responsible for facilitating the local planning and installation of E9-1-1 systems and assisting with the maintenance of statewide E9-1-1 services. The counties were made responsible for ensuring E9-1-1 services were available to all citizens at the local level.

One of the most important ways the state has discharged its responsibility has been to provide funding to counties that were unable to generate enough revenue on their own. The population of Washington varies widely from county to county and the state program was able to take that into account in the distribution of funds. The results of the program show their success. All 39 counties provide landline and wireless enhanced 9-1-1 services through 67 primary public safety answering points (PSAPs) serving the entire population of 6.2 million and all state visitors.

A state E9-1-1 Advisory Committee advises and assists the state E9-1-1 Program Office in coordinating and facilitating the operation of E9-1-1 in the state of Washington. The Director of the Washington's Military Department, the Adjutant General, appoints the members as prescribed in RCW 38.52.530, which include state and local associations of cities, counties, public safety first responders, utilities, and the state chapters of two national 9-1-1 and public safety communications organizations.

The E9-1-1 Advisory Committee works with agencies and regulators to recommend uniform state standards for E9-1-1 based on national standards. Several subcommittees assume responsibility for specific issues. Among these are the 9-1-1 communications, NG9-1-1, public education, policy, strategic planning and training. The Committee, in conjunction with the E9-1-1 Program Office, has developed a deployment plan to guide its activities.<sup>3</sup>

The state of Washington 9-1-1 system is funded by an excise tax assessed equally on both landline and wireless communications services. Carriers collect the tax monthly from their subscribers. The state rate is a maximum of 20 cents per month for each switched landline and radio access line. The carriers remit the state tax to the DOR, which places it in the state E9-1-1 account. The county rate is a maximum of 50 cents for each switched landline and radio access line, and the state requires counties to collect the

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<sup>3</sup> State of Washington Six-Year Plan Subcommittee First Interim Report to the E9-1-1 Advisory Committee, "Next Generation 9-1-1 in Washington State, A Six-Year Deployment Plan" September 20, 2007

maximum authorized 9-1-1 tax before they can qualify for state funding. All counties are collecting at the maximum rate. The carriers remit the county tax to the county treasurer. This assessment rate has not been changed since it went into effect in 1992.

In the course of the succeeding 16 years, technological progress has begun to undermine the state 9-1-1 system in two critical ways: impact on revenues and impact on the system's ability to provide E9-1-1 service to callers using new technologies. A third critical impact is inflation.

Revenues are impacted directly because new technologies are not included in the excise tax. Currently only landline and wireless services are subject to the 9-1-1 excise tax. One predominant new service is VoIP<sup>4</sup>, which is not always subject to the 9-1-1 excise tax. As consumers abandon their landline services in favor of VoIP, there may be a corresponding loss of revenue. The fact that the current body of law does not provide for all of these services to contribute to the support of the state's 9-1-1 system has serious implications, as described later in this report.

In addition, revenues are impacted by inflation, which has decreased the value of state and local 9-1-1 revenues by 34 percent over the last 16 years, according to the Washington State Economic and Revenue Forecast Council's estimates for the period from 1995 through 2006. According to the Washington E9-1-1 Program Office, the replacement of aging equipment that needs to occur is being postponed in an effort to increase the funds available to convert to NG9-1-1.

Public safety is directly impacted because the current 9-1-1 system is not able to provide E9-1-1 to citizens using certain new technologies—an issue that is compounded by the reduction in available funding for necessary upgrades. A prime example is text messaging. Texting has become the preferred mode of communication for the hearing- and speech-impaired communities. Texting allows them to communicate with everyone without the need of any special equipment or third party intervention. The other large population using texting is today's youth. Both of these groups expect to be able to reach 9-1-1 using the text feature on their cell phones. The reality is they cannot. A real-life example of this occurred during the Virginia Tech shootings in 2007 when students tried to text 9-1-1 to report what was happening, but their messages could not get through. The 9-1-1 technology in the state of Washington and nationwide has reached the point where it must be modernized if it is to continue to meet the public's expectations.

The combination of all these factors was the impetus for the Legislature to request a study in the 2008 Supplemental Budget. Subsequently, the E9-1-1 Program Office issued an RFP for a NG9-1-1 funding study. Kimball was engaged to conduct the study to recommend an appropriate funding mechanism for the implementation of NG9-1-1. To do this, Kimball identified the level of funding necessary to support the current statewide E9-1-1 system at the state and county levels, and assessed the revenue needed to support the implementation and operation of NG9-1-1.

Kimball is pleased to present the Washington State Military Department with the results of its study.

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<sup>4</sup> There are many VoIP providers in the State of Washington. The largest VoIP providers are Vonage and Comcast.

### **3. METHODS**

#### **3.1 DATA COLLECTION**

Kimball worked in close conjunction with the Washington E9-1-1 Program Office, the state Department of Revenue (DOR) and the E9-1-1 Advisory Committee's NG9-1-1 Subcommittee and others, to collect the information necessary for the study. The state provided:

- Copies of county contracts and audits
- Revenue and cost information relating to the state's 9-1-1 excise tax
- Assistance with the distribution of a survey to each county and the collection of the survey responses (the survey requested current and projected revenues and costs, and PSAP technology information)
- Copies of current E9-1-1 legislation and the E9-1-1 Program Office's administrative rules
- The NG9-1-1 Subcommittee's interim report containing a description of the desired NG9-1-1 system design for Washington, meeting minutes, and policies

Kimball entered the state and county financial information into several Excel spreadsheets to facilitate analysis.

On October 7, 2008, the state E9-1-1 Program Office hosted a series of stakeholder meetings. The first meeting was between Kimball and the E9-1-1 Program Office staff. The second meeting was with personnel from other state agencies, telecommunications service providers and county 9-1-1 coordinators. The third meeting was with the Advisory Committee's NG9-1-1 Subcommittee. All meetings were intended to exchange information about the project, the management of the project, and to identify issues and concerns that would influence the study and its outcome.

The Kimball team continued to work at the Camp Murray offices of the E9-1-1 Program Office through October 10, 2008. The team conducted the analysis and compiled the first draft of the NG9-1-1 Funding Study Report presented to the E9-1-1 Program Office on October 20, 2008.

On October 31, the state E9-1-1 Program Office received responses to its RFP for establishing an ESInet and automatic location information (ALI) database. On November 3, 2008, the new financial information was provided to Kimball.

#### **3.2 DATA ANALYSIS**

Data analysis was straightforward, and for each exercise, the Kimball team drew on its collective industry experience and knowledge, as well as experience with similar projects in other states.

The primary areas of analysis were:

- State and county revenues and expenditures, both current and projected
- PSAP technology

- The state's NG9-1-1 system design
- The Revised Code of Washington (RCW) and Washington Administrative Code (WAC)

### **3.2.1 Excise Tax Calculator Tool**

Kimball built an excise tax calculator to determine the tax rate that would be needed to fund current costs, NG9-1-1 transition costs, and NG9-1-1 ongoing operations and maintenance costs. The calculator provided two options:

- Current funding mechanism, which assesses the tax on switched access landlines and radio access lines
- Recommended funding mechanism, which assesses the tax on switched access landlines, radio access lines, Voice over IP, prepaid wireless and any other telecommunications service that enables a caller to make contact with the E9-1-1 system.

### **3.2.2 Current Costs and Revenue Requirements**

Kimball compiled information and compared current costs and revenues to identify funding shortfalls or surpluses. This information became the baseline for the remaining aspects of the study. Using the excise tax calculator, we determined the excise tax rate needed to cover current costs for (1) the state, (2) the counties and (3) the grand total.

### **3.2.3 Budgetary NG9-1-1 Transition Costs and Revenue Requirements**

Kimball drew upon a variety of resources in conducting this aspect of the analysis, including National Emergency Number Association (NENA), NG9-1-1 standards, the USDOT Proof of Concept, the E9-1-1 Advisory Committee's Six-Year Plan, the responses to the RFP, and the industry knowledge and experience of the project team. Our analysis included an assessment of the extent to which existing PSAP technology would have to be upgraded or replaced to meet the NG9-1-1 requirements.

For the purposes of providing budgetary pricing for the NG9-1-1 transition, Kimball added the NG9-1-1 transition costs to the known current costs. The assumption behind this approach was that the legacy system would continue in operation while the NG9-1-1 system was being implemented. Using the excise tax calculator, we determined the excise tax rate needed to cover transition costs for (1) the state, (2) the counties, and (3) the grand total. Kimball assumed the transition period would be tightly managed to minimize the amount of time the two systems would need to operate in parallel, and therefore anticipated the legacy system would be decommissioned by Fiscal Year (FY) 2014.

The pricing that was received from the Washington NG9-1-1 RFP was not used in the budgetary pricing for this project. The RFP was very broad in scope, and the RFP process was still ongoing. This resulted in the detailed information not being available. Kimball was not able to determine if the proposals included all of the NG9-1-1 services that we used to determine the budgetary pricing.

### **3.2.4 Budgetary NG9-1-1 Operations and Maintenance Costs and Revenue Requirements**

Kimball based our analysis on the state E9-1-1 Advisory Committee's Six-Year Plan with guidance from the state E9-1-1 Program Office's staff to accommodate the fact that the execution of the Six-Year Plan is behind schedule. We drew upon our industry knowledge and experience to estimate post-transition,

ongoing costs and then adjusted those figures after we received the data from the RFP responses. Using the excise tax calculator, we determined the excise tax rate needed to cover NG9-1-1 maintenance and operational costs for (1) the state, (2) the counties, and (3) the grand total.

### **3.2.5 Maximum Tax and Inflation Adjustments**

Using the calculator as the basis, Kimball identified the maximum tax rate needed to fund state and county costs through the transition period, and for ongoing operations and maintenance of NG9-1-1.

### **3.2.6 Recommendations for Legislation**

Kimball conducted a preliminary review of the RCW to identify areas requiring update in the current environment, and then commenced a more detailed review of the existing body of law in the context of this study's findings. In consultation with the E9-1-1 Program Office and DOR staff, and drawing upon the industry experience and expertise of its project team, Kimball developed recommendations for legislation.

## **3.3 ASSUMPTIONS**

The scope of the project did not include an assessment of the accuracy of the information that the state and counties had provided; rather, Kimball proceeded on the assumption that the information from the following sources was correct.

- Most of the state 9-1-1 costs are from the statewide services spreadsheet with NS 7-07 to 7-08. The state office expenditures are state office expenses, CJTC contract and HSDC contract amounts provided by the state 9-1-1 office.
- The state reimbursement (\$6,557,311.02) to the counties is from the PSAP payment worksheets for FY 2008.
- The statewide dialing costs, basic service costs, capital costs and other PSAP costs are from the PSAP data surveys that the counties completed for us.

After implementation of NG9-1-1, operational and maintenance costs will remain at approximately \$13 million/year.

We used the total current costs, even those costs not now covered by the excise tax.

We assumed the transition period would be tightly managed to minimize the amount of time the two systems would need to operate in parallel, and therefore anticipated the legacy system would be decommissioned by FY 2014.

We assumed the counties would pay for the NG9-1-1 equipment and services at the PSAP, and if local funding were inadequate, the state would pay the difference. We did not have a way to calculate this as a percentage based on the data provided to us. The equipment and services at the PSAP consist of the workstations, call routing and border control functions. These functions could be performed by equipment at the PSAP, or by a contracted service.

We assumed that the basic approach of assessing a 9-1-1 excise tax on telecommunications services would remain in place.

According to the Washington Office of Financial Management (OFM), the rate of inflation over the past 16 years has increased the cost of doing business by 34 percent. Based on this assessment, the average inflationary increase per year is approximately 2.12 percent.

## 4. CURRENT SYSTEMS

### 4.1 HISTORICAL PERSPECTIVE

In 1967, President Johnson's Commission on Law Enforcement and Administration of Justice recommended the establishment of a single nationwide number for reporting emergencies. Subsequently, AT&T, at the request of the Federal Communication Commission (FCC), established that 9-1-1 would be the emergency code throughout the United States.

When AT&T first introduced the service, 9-1-1 calls were sent to a single destination based on the caller's telephone exchange. Since there was (and is) little or no correlation between a telephone exchange boundary and the emergency responder's jurisdiction, a 9-1-1 call could end up at a PSAP that did not serve the caller's location. This early 9-1-1 service, known as basic 9-1-1, did not provide any telephone number or location information with the call—it was a voice service only; the caller had to provide his or her location and call back information.

In the early 1970s, a new feature, selective routing, allowed for the delivery of the 9-1-1 call to the PSAP serving the caller's location. Further developments in the 1980s provided automatic number identification (ANI) and ALI with the voice 9-1-1 call. These features enabled responders to locate the caller, even if the caller could not speak or otherwise provide his or her location.

By the 1990s, the use of cellular technology increased dramatically as consumers in our increasingly mobile society enthusiastically adopted it. Initially, it was expected that cellular phone use would occur primarily in cars on America's roads and highways, and by extension, so would cellular emergency calls. No one anticipated that people would carry and use them wherever they went. These changes in consumer calling habits posed serious challenges for public safety, because landline E9-1-1 systems did not have the capability of providing location information for cellular callers.

In 1996, the FCC released its first report and order on docket 94-102 mandating wireless E9-1-1. The cellular industry devised two main solutions to identify the longitude and latitude of the caller's location: a GPS chip within the handset itself or networked triangulation from cellular towers. Implementation was to occur in two phases: Phase I provided the caller's call back number and the address of the receiving antenna tower; Phase II provided a more accurate latitude/longitude coordinate for the calling device. Phase II accuracy requirements varied depending on technology. The network solution required location to be within 100 meters (328 feet) for 67 percent of calls and 300 meters (984 feet) for 95 percent of calls; the handset solution required location to be within 50 meters (164 feet) for 67 percent of calls, and within 150 Meters (492 feet) for 95 percent of calls. There was still the problem of getting this new type of location data into the existing landline E9-1-1 system, and the wireless E9-1-1 solution we have today is essentially a work-around. Although less-than-perfect and inherently less reliable than landline technology, wireless E9-1-1 service has been implemented statewide. Not long after wireless E9-1-1 implementations began, VoIP, text messaging, picture and video messaging, and other new technologies appeared on the market, adding a host of new issues and challenges for 9-1-1. Consumers have adopted these technologies for their everyday communications, and they expect to be able to use these technologies to communicate with 9-1-1.

## 4.2 CURRENT TECHNOLOGY

PSAPs in the state of Washington have adapted and changed during the evolution of E9-1-1. Each change has meant a change to the technology and equipment needed at the PSAP. The voter referendum that established Washington's E9-1-1 Program Office recognized the need of a funding mechanism for the escalating costs of E9-1-1. The E9-1-1 Program Office provides funding to counties that cannot generate enough revenue on their own. Today, all 39 counties provide landline and wireless enhanced 9-1-1 services through 67 primary PSAPs serving Washington's 6.2 million residents. Two of the PSAPs serve more than one county.

Kimball surveyed the county 9-1-1 coordinators to obtain information about technology, revenues and costs. The following data were developed from the survey responses.

There are 570 call-taker equipment positions; the largest PSAP has 45 and the smallest has two.

- Seven PSAPs have 21 or more equipment positions
- Twelve PSAPs have 10 to 20 equipment positions
- Fifty PSAPs have 10 or fewer equipment positions

Each call-taker position contains the following equipment at a minimum:

- Telephone equipment
- Mapping equipment
- Call management equipment, including voice recorders
- Computer aided dispatch (CAD)

Each PSAP has emergency backup power capability, and other miscellaneous equipment (clock synchronizer, instant call checks and headsets).

According to the PSAP survey:

- Total current value of the all the PSAP equipment in Washington is \$82,825,449.
- Maintenance costs for this equipment is approximately \$21,886,343 a year.
- New purchase or upgrades to the systems would cost approximately \$34,099,578.

The age of the equipment varies from PSAP to PSAP. Most of the equipment was purchased before 2007. Based on industry knowledge, all equipment installed before 2007 will have to be replaced or upgraded before the NG9-1-1 network is fully deployed.

The following is a breakdown of the PSAP equipment by category and number of PSAPs where equipment was installed before or after 2007:

<b>Equipment</b>	<b># of PSAPs before 2007</b>	<b># of PSAPs after 2007</b>
Telephone Equipment	53 (453 positions)	5
Mapping	54 (499 positions)	5
Call Management Equip	54 (465 positions)	5
Computer Aided Dispatch	52 (396 positions)	7

According to the FCC Local Telephone Competition Report of December 31, 2007, the state of Washington had:

Landline—3,070,965 devices  
Wireless—5, 291,131 devices

National figures showed a five percent drop in the number of landline customers in the year ending December 2007, and a nine percent increase in the number of wireless customers. During that same period in the state of Washington, there was more than an eight percent drop in the number of landline customers and a nine percent increase in the number of wireless customers.

During the meeting between Kimball and the NG9-1-1 subcommittee, the PSAP members confirmed the steady increase in wireless customers and the continued decline in landline customers. Washington is following the national trend where the wireless increases exceed the landline decline. Currently, wireless calls in the state of Washington account for 60 percent of the 9-1-1 calls and landline accounts for approximately 40 percent. They also reported the number of VoIP customers is also increasing.

The state of Washington has 18 incumbent local exchange carriers (ILECs) and 41 competitive local exchange carriers (CLECs) for a total of 59 landline carriers. Qwest, Embarq and Verizon provide E9-1-1 service. Collectively, they supply the selective routing, LEC interface, frame relay, and switching office enabling to all PSAPs. The costs of these statewide services are paid by the state E9-1-1 Program Office. The state's total cost for FY 2008 was \$8,079,112.03.

## **4.3 FUNDING MECHANISMS**

### **4.3.1 State and County Excise Tax**

Enhanced 9-1-1 in the state of Washington is funded by a state and county 9-1-1 excise tax on all switched access landlines and all wireless access lines. The taxation rate is required by statute to be the same for both technologies.

A county legislative body may impose the tax in an amount not to exceed 50 cents per month for each landline or wireless line. The county is required to notify all carriers providing service in the county at least 60 days in advance of the date on which the first payment is due. The carriers remit the tax to the county treasurer.

The state may impose the tax in an amount not to exceed 20 cents per month for each landline or wireless line. The carriers remit the tax to the Washington DOR on an excise tax return form. The State Treasurer deposits the revenue into the enhanced 9-1-1 account created by RCW 38.52.540.

#### **4.3.2 Eligible Use of County 9-1-1 Funds**

RCW 82.14B.050 provides for counties to use their 9-1-1 revenues to cover the costs of their 9-1-1 emergency communications systems. It does not otherwise define how the funds may or may not be used. Authorized costs include salaries of personnel, as well as technology.

#### **4.3.3 Eligible Use of State 9-1-1 Funds**

The state may use its funds only:

- To support the statewide coordination and management of the enhanced 9-1-1 system.
- For the statewide implementation of wireless enhanced 9-1-1.
- To help supplement, within available funds, the operational costs of the system, including:
  - o Adequate funding of counties to enable implementation of wireless enhanced 9-1-1 service;
  - o Reimbursement of wireless companies for costs incurred in providing wireless enhanced 9-1-1 service pursuant to negotiated contracts between counties or their agents and the commercial mobile radio communications service companies.

The state E9-1-1 coordinator, with the advice and assistance of the Advisory Committee, has the authority to enter into statewide agreements to improve the efficiency of enhanced 9-1-1 services for the counties. The state has contracts with 36 of the 39 counties to date: seven receive funding only for coordinator professional development (CPD), six receive funding only for CPD and wireless costs, and the remaining 23 receive funding for CPD and eligible landline and wireless costs. In order to qualify for state funding, a county must first have assessed the maximum tax amount and then expended the receipts on eligible items. Subject to the availability of funds, the E9-1-1 Program Office helps make up the difference between revenues and costs for counties that cannot generate enough revenue to fully fund 9-1-1 on their own.

The E9-1-1 Program Office's administrative rules define the items considered eligible for use of state 9-1-1 funds. These include personnel, such as call-takers, IT or GIS specialists, telephony costs related to equipment on site at the PSAP, and costs related to routing the calls to the PSAPs, etc. (See WAC 118-66-050, Eligible Expenses.)

The state's priorities<sup>5</sup> in providing this support are:

- To assure that 9-1-1 dialing is operational statewide.
- To assist counties as necessary to assure that they can achieve a basic service level for 9-1-1 operations.
- To assist counties as practicable to acquire items of a capital nature appropriate to increasing 9-1-1 effectiveness.

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<sup>5</sup> WAC 118-66-020, Purpose and priorities

#### 4.3.4 Annual Excise Tax Rate

The annual excise tax rate for landline is set each calendar year. By August 31 of each year, the state enhanced 9-1-1 coordinator makes a recommendation to the Washington Utilities and Transportation Commission (WUTC) for the following year's landline tax level. The WUTC sets the rate for the following year by October 31 of each year. The rate has been at the maximum for a number of years. The wireless tax rate is fixed at 20 cents.

#### 4.3.5 The Issue

As noted previously, the E9-1-1 excise tax rate has not changed in the 16 years since its inception in 1992. Meanwhile, new telecommunications technologies have appeared, such as wireless and VoIP, and consumers are steadily abandoning their landline telephone service in favor of these more mobile and less costly technologies.

More than 10.6 million U.S. households now have at least one active VoIP user, according to itfacts.biz, a web-based industry research organization.<sup>6</sup> Based on official state population information for 2008, Washington has 6,587,600 permanent residents<sup>7</sup> and 2,642,598 households.<sup>8</sup> Assuming the state of Washington tracks with the rest of the nation, a conservative estimate of residential VoIP usage would be 92,491 households. In the state of Washington, non-telephone company VoIP is not subject to the 9-1-1 excise tax, which has resulted in a steady reduction in revenues available to support 9-1-1.<sup>9</sup> If all VoIP users were to pay the 9-1-1 excise tax at the existing rate, an additional \$554,946 a year would be raised to support 9-1-1 at the county level, and an additional \$221,978 a year would be raised at the state level.

According to the FCC's report on landline competition for 2007, there are 5,291,131 wireless subscribers in the state of Washington.<sup>10</sup> National estimates put prepaid wireless at 12 percent of total wireless customers.<sup>11</sup> That means that there are at least 634,936 prepaid customers in the state of Washington. If these prepaid customers were to pay the 9-1-1 excise tax at the existing rate, an additional \$3,809,616 would be raised annually to support 9-1-1 at the county level, and an additional \$1,523,846 would be raised at the state level.

It is clear that the number of consumers who are not paying the 9-1-1 tax is increasing as people switch from landline telephone service to technologies that are not taxed under the statute. The practical effect is

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<sup>6</sup> <http://www.itfacts.biz/106-mln-voip-users-in-the-us/8294> (October 12, 2008)

<sup>7</sup> State of Washington, Office of Financial Management, "Population of Cities, Towns, and Counties Used for Allocation of Selected State Revenues State of Washington," April 2008, <<http://www.ofm.wa.gov/pop/april1/finalpop2008.pdf>> (October 12, 2008)

<sup>8</sup> State of Washington, Office of Financial Management, "Illustrative Household and Persons per Household Projections Using the Growth Management Act Population Projections: 2005 and 2010," last modified November 9, 2006, <<http://www.ofm.wa.gov/pop/illustrative/cohhproj.pdf>> (October 12, 2008)

<sup>9</sup> The FCC requires VoIP service providers to provide enhanced 9-1-1 to their customers, and to pay 9-1-1 fees when required by state law. The RCW 82.14B.020 (3) provides that "switched access line" means the telephone service line which connects a subscriber's main telephone(s) or equivalent main telephone(s) to the local exchange company's switching office." And RCW 80.04.010—"local exchange company" means a telecommunications company providing local exchange telecommunications service. Thus, only VoIP service providers that are also telephone companies are currently subject to the 9-1-1 excise tax. Other types of VoIP service providers are not.

<sup>10</sup> Federal Communications Commission, Landline Competition Bureau, "Local Telephone Competition: Status as of December 31, 2007," September 2008. Table 14.

<sup>11</sup> According to a 2007 TracFone presentation to NASNA

that those who do pay are subsidizing those who do not pay. This trend will most certainly continue, and the revenue loss will most certainly worsen unless action is taken.

#### 4.4 CURRENT COSTS

The current cost of E9-1-1 in the state of Washington is funded by local and state 9-1-1 excise taxes. The local government subsidizes the remaining costs. Operational expenses are identified as equipment, salary, training and other costs. In 2008, the PSAPs identified the following operational expenses totaling \$155,627,214:

- Equipment—\$45,155,150
- Salary—\$106,853,277
- Training—\$1,608,995
- Other—\$2,009,792

The state E9-1-1 Program Office provided Kimball a copy of its Statewide Services County Summary Spreadsheet for FY 2008. The spreadsheet itemized the yearly cost for the E9-1-1 services provided. The total cost of these services was \$8,234,986.49. The cost per service was:

- Database total—\$4,269,271.68
- Switching office enabling total—\$1,152,520.62
- Selective router total—\$1,306,191.49
- Frame relay total—\$736,646.12
- LEC interface total—\$458,607.66
- Intertandem—\$155,875.46
- Night service—\$116,601.15

The state E9-1-1 Program Office pays for language line access, a statewide 9-1-1/TTY training program, and telecommunicator training and certification. These costs total \$1,091,645:

- Language line—\$88,541.15 per year
- Statewide 9-1-1/TTY training program—\$288,000 (\$144,000 per year) from August 23, 2007 to June 30, 2009
- Telecommunicator training and certification—\$715,104 (\$357,552) from July 1, 2007 to June 30, 2009

According to the Washington State Economic and Revenue Forecast Council's estimates for the period from 1995 through 2006, the rate of inflation over the past 16 years has increased the cost of doing business by 34 percent. Based on this assessment, the average increase per year is approximately 2.12 percent per year.

According to the survey data for 2008, responding counties identified the following:

- System maintenance cost—\$21,886,343

Current value of equipment—\$82,825,449

Purchase or upgrade of equipment—\$34,099,578

Equipment life cycles and emerging new technologies have an important impact on PSAPs. Generally, a PSAP would upgrade each workstation at the same time; likewise, a new installation project would involve each equipment position at a PSAP. Equipment replacement has a huge impact on an agency's budget, and the lifecycle of PSAP equipment, because it is used 24/7, is typically a maximum of three years.

## 5. NG9-1-1 DESIGN

The Six-Year Plan and the NENA Functional and Interface Standards for Next Generation 9-1-1 Version 1.0 served as a baseline for Kimball's cost estimates. Interviews with Washington State staff, county coordinators, and other 9-1-1 stakeholders combined with PSAP surveys provided a good picture of current statewide network infrastructures and services they provide.

The NG9-1-1 system architecture will have to be robust and redundant to meet the needs of the state now and into the future. A scalable architecture will be needed to allow for new technologies as they evolve. The USDOT proof of concept for NG9-1-1 has included text messaging and video as NG9-1-1 components that will be supported. Standards documentation specifies a robust network interfacing with other networks, thus becoming "a network of networks." Applications will also require scalability and redundancy. Servers and application design to support the NG9-1-1 applications should meet the same best practices as the IP transport design.

NENA's NG9-1-1 model anticipates "a system with shared networks, databases and applications in which the communications costs of public safety agencies are shared amongst all participants in the NG9-1-1 system..."<sup>12</sup> The applications necessary for NG9-1-1 will require robust network design with strict policies to guarantee delivery of voice traffic.

The Six-Year Plan specified several recommendations regarding the network. These include following the NG9-1-1 architecture shown in Figure 5 in this document. The report recommends using the "network cloud" shown in Figure 6. They also recommended the RFP, which generated costing data that was included in this document. The committee felt strongly that the E9-1-1 Program Office for the state should own or manage both the network and the access gateways to ensure security of the system. Additional information on NG9-1-1 systems can be found in the publications from the USDOT's NG9-1-1 System Initiative at <http://www.its.dot.gov/ng911/index.htm>.

The sharing of infrastructure must be considered in the design and implementation of a NG9-1-1 statewide network. Engineering and design principles must be applied to ensure that security, reliability, and all the recommendations outlined by NENA and the USDOT are observed. The sharing of information across the state of Washington is paramount in providing NG9-1-1 applications to all PSAPs and a statewide ESInet will provide the architecture to connect all the 9-1-1 entities in Washington.

Functional elements of the Washington State NG9-1-1 network will include border control functions, location validation functions, and policy-based routing. Please keep in mind that this is not a design document and these functional elements are only a small part of the next generation technology and the statewide network.

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<sup>12</sup> National Emergency Number Association Next Generation Partners Program, "Funding 9-1-1 into the Next Generation: An Overview of NG9-1-1 Funding Model Options for Consideration," March 2007.



safety technologies and features that are available today and will be available in the future. The current network is not capable of accepting some current and emerging communication devices.

Currently, Washington's PSAPs are served by three different E9-1-1 service providers, causing problems when data need to be transferred from a PSAP on one network to a PSAP on a different network. A NG9-1-1 system will give each PSAP the ability to transmit, receive, process, transfer, dispatch, use, and store both voice and data associated with a 9-1-1 call.

The Six-Year Plan 9-1-1 addresses funding as it relates to the building of a new statewide network. The Plan reflects the best national thinking and envisions a truly NG9-1-1 service model in which "networks, databases, and applications are shared among emergency responders and response agencies." It follows that the costs for these components would also be shared, thereby reducing the financial burden on the state and county 9-1-1 authorities. While the Six-Year Plan and Kimball's study focused on existing tax structures, the state will eventually want to study alternative funding options more reflective of a NG9-1-1 environment in an effort to leverage cost-sharing opportunities.

Finally, we note that the state's final ESInet design may be impacted differently depending on the vendor chosen as a result of the RFP. There may be an impact on the PSAPs' E9-1-1 equipment if the solution requires the use of specific equipment.

### **5.2.1 Potential User Devices**

The current E9-1-1 system in the state of Washington cannot handle the functions and data that emerging technologies are able to transmit. New services that are available today allow these new devices to transfer large amounts of data in the form of messaging, pictures and video, as well as voice data. The NG9-1-1 network must be able to accommodate the current demands of wireless and VoIP along with future technologies that will have an impact on public safety. The following is a list of devices and services that will need to be considered in a NG9-1-1 network:

- Landline
- Wireless
- PDAs
- VoIP
- Telematics
- Pre-paid wireless
- Text messaging (IM,SMS,Etc.)
- Pictures
- Video
- Other future technologies

Supporting these new technologies and devices require a reconfiguration of how the current network in Washington State operates. New equipment, databases, servers, etc., are required to bring 9-1-1 service to these potential user devices and their associated technologies. The Six-Year Plan recognizes that major improvements are necessary in the current 9-1-1 infrastructure, including the capability for multimedia services that will enhance public safety. When any new technology is introduced or advanced functionality is required, there are cost implications.

## 5.2.2 Database Management

In the state of Washington, each county manages its own ALI database with a vendor. Databases are an important part of a NG9-1-1 network because the network integrates with a number of legacy databases as well as the new databases that store NG9-1-1 information. These legacy databases can help facilitate transition for the PSAPs from analog to digital mode, and they may be phased out eventually. Some of the new databases require new hardware and software that impacts the cost of a NG9-1-1 system.

The databases described below are part of NG9-1-1 but do not exist in the current network. The following is a description of the databases and information that have a role in a NG9-1-1 network.

Location-to-Service Translation (LoST) Protocol database is a database that stores location information in a GIS format and is used to translate a location both geographic and civic to the proper response agency and PSAP.

The identity and access management (IdAM) provides a level of security by maintaining and managing the identities of all entities utilizing the network and network resources.

The business rules database contains the policies of the NG9-1-1 network. These policies determine how the system routes calls to the appropriate PSAPs, as well as where it can get supplementary or supportive data.

The call record database is used to store information and properties associated with an incoming emergency call entering the NG9-1-1 network. Each call record that is created is then stored in the call record database for auditing purposes.

Many of these databases and associated servers, services, and other necessary hardware will need to be purchased, adding to the cost implications of building a NG9-1-1 network. Equipment will need to be purchased, configured, and maintained in order to run a network. A cost breakdown of associated equipment is located in Appendix C.

## 5.2.3 Disaster Recovery

Disaster recovery is an issue for the NG9-1-1 network. Should a disaster occur, there should be minimal impact on emergency services, meaning little or no degradation of service.

NG9-1-1 systems have redundancy and, by design, have disaster recovery considerations. NG9-1-1 differs from the current E9-1-1 configurations most dramatically in where the information is hosted to control call processing.

This changes the dynamic on how to provide redundancy in a NG9-1-1 network. Carriers can now provide redundant physical connections to the ESInet in different geographical locations. Data centers to host call processing can be located in different physical locations and configured to mirror each other. PSAP connections can be any form of IP connectivity as long as the quality of service standards is met. Redundant IP connections to PSAPs do not have to be the same physical type of connection and different service providers can provide them. All the processes required to deliver emergency calls can be based in the network instead of at each PSAP.

The network design for NG9-1-1 is based on the International Organization for Standardization's Open Systems Interconnection Basic Reference Model (OSI Reference Model or OSI Model). This model has seven layers used to provide connectivity in the network.

Redundancy between the carriers and network core can be provided by placing alternate paths into the network. These connections should be geographically dispersed to provide additional fault tolerance. Carriers can split incoming services across multiple links for additional redundancy.

Redundancy between the network core and PSAP locations can be accomplished by placing links, not only directly to each PSAP but also between the PSAPs. Any PSAP can then route call information through its neighboring PSAP in the case of a primary link failure. Alternate links between PSAPs can be from different service providers to provide additional redundancy.

Network monitoring now can be added to allow proactive monitoring of the network. Current networks operate in a 'break/fix' mode of operation.

Servers and applications can be located in physically diverse locations and mirrored across the network. This provides redundancy, and it can be initiated in multiple locations.

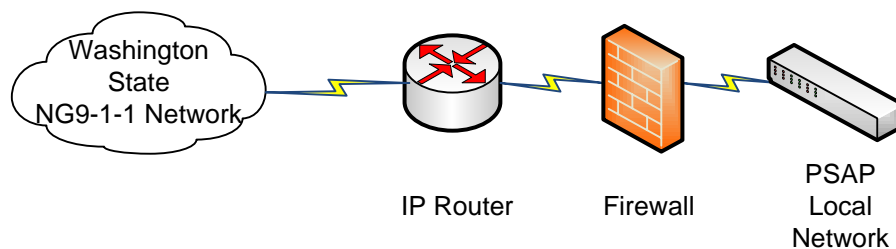
The network design ensures any single failure of a network core server or communications link does not affect continued operation of the network and services, since PSAPs are now nodes to the core network. Communications to each PSAP can immediately be re-routed to another PSAP location in the event of a PSAP failure for any reason. Alternate PSAP locations can be configured over any IP connection to the core network.

## 5.2.4 Network Security

PSAP and regional ESInets are considered to be trusted networks; therefore, vendors today do not use firewalls to secure the network. NENA 08-002 recommends security standards between agencies to have both sign-in security and a public key infrastructure policy. Federal security policies recommend the use of a private key infrastructure policy.

The NENA security committee is currently working on standards that may require additional security between each PSAP and the ESInet, and that design is recommended for this network. At this time, NENA recommends a public key infrastructure policy, which should also be incorporated into the network design.

The figure below illustrates necessary security infrastructure.



The NG9-1-1 applications will require local data to be merged into a single server network. Access to this network will need to be controlled because the applications and data on the network will be available to

other agencies on the network. Policy layers will need to be established to determine NG9-1-1 access controls, as well as call routing functions. Parameters from the NENA documents set many of these policies.

### **5.2.5 Emergency Notification System**

NG9-1-1 system design allows for centralization of data required for implementation of an emergency notification system (ENS) on a statewide level. The NG9-1-1 system design allows emergency notification systems to be either centrally located or dispersed around the state. These systems would be accessible from anywhere on the secure network.

Configuration, hardware, software, management and network resources would be required to implement an ENS. The equipment would need to be purchased and configured. Databases would require maintenance and updates. Outbound trunking services will be required to place calls.

Optionally the state could maintain the database and software required for an ENS and contract a service to place the calls. These services are available from several carriers.

Review of the available standards on emergency notification systems should be completed prior to deploying an ENS.

## **5.3 NG9-1-1 COSTS**

The attached NG9-1-1 budget plan makes several assumptions regarding the deployment of the NG9-1-1 network. During the first year, the infrastructure for the network is installed and configured. Deployments begin in the second year and are completed statewide by the fourth year. Based on a three-year deployment schedule, the Six-Year Plan assumes a third of the PSAPs will be deployed each year. The escalating costs in the Plan reflect fees based on the entire 12 months. The NG9-1-1 system will require the following elements:

- Border gateway functions
- Emergency services routing protocol (ESRP) functions
- NG9-1-1 equipment at PSAP

Each of these NG9-1-1 elements has non-recurring and recurring costs. In the first year of the project, the network has to be built. (Costs associated with the current E9-1-1 system are not represented in the following chart.)

<b>Year</b>	<b>Estimated Costs</b>
2009	\$ 1,300,000
2010	\$ 7,598,000
2011	\$15,818,267
2012	\$13,452,267
2013	\$16,919,067
2014	\$12,962,400
2015	\$12,962,400
2016	\$12,962,400

After deployment and transition of all the PSAPs to the new network, the centralized automatic message accounting (CAMA) trunks will be phased out. We did not eliminate the cost of CAMA trunks in 2014 because the cost of connectivity to legacy LECs system post deployment is not known, but will most likely be similar to the current costs. The legacy system would continue in operation while the NG9-1-1 system is being implemented, and after implementation, the two systems would run in parallel for a while.

The state of Washington received four responses to its RFP. One did not include any NG9-1-1 functions, and the remaining three proposed pricing between \$25.2 million and \$41.1 million.

Kimball estimates the non-recurring cost for the statewide network without PSAP equipment will cost approximately \$12 million, and the proposals indicate between \$845,000 and \$3,900,000. The state's review of the proposals is still ongoing, so it is not clear to Kimball whether these prices included all the components of an ESInet and whether they were for managed services or a purchased system.

Kimball estimates the annual recurring costs for the statewide ESInet will be approximately \$12.9 million; the proposals indicate annual recurring costs between \$2.1 million and \$10 million.

## 6. GAP ANALYSIS

### 6.1 TECHNOLOGY

The Six-Year Plan addresses the technology needs of Washington State as they relate to NG9-1-1. There are many instances where equipment, including both hardware and software, set limitations on the network's capabilities. Old or out-of-date equipment must be replaced or upgraded from what exists presently in order to achieve a NG9-1-1 level of service. New communications technologies will need to have plug and play access and interfaces. The adoption of IP-based equipment at this and all levels will speed the deployment process. IP-based systems should be carefully reviewed prior to adopting them to ensure they are truly IP-enabled and not partially enabled or using IP in only a part of the process. For those PSAPs that have been migrating to IP-enabled PSAP equipment, an upgrade may be required to enable the system to accept and process NG9-1-1 applications.

When creating an IP network out to the PSAP, the interface to individual PSAPs will be, in many instances, to equipment that is not currently NG9-1-1 capable. This can be overcome during the rollout by installing gateways at the PSAP to interface between the legacy PSAP equipment and the IP network. This interface, along with the legacy PSAP equipment, will limit the level of NG9-1-1 applications available to the PSAP, but this issue should not delay or hinder the deployment of a statewide NG9-1-1 network.

Equipment to be replaced or upgraded may include:

- Telephony equipment
- CAD
- NG9-1-1 requiring new and different databases
- Mapping equipment
- Call management equipment, such as logging recorders
- Power supply equipment, such as uninterruptible power supply (UPS) systems
- Miscellaneous equipment, such as clock synchronizer, headsets, record retention devices

### 6.2 OPERATIONS

Operations include both technical and operational issues. The technical operations refer to the ownership, management, maintenance, and cooperative agreements required of a NG9-1-1 system. The Six-Year Plan recommends that the state own or manage the new system.

Connecting the legacy selective routers to the new IP-enabled network may be an issue with some carriers. Traditional tariffs and telephone company rules have included language that allows a LEC to limit equipment that is connected to its network. These rules may create problems in implementing the IP-enabled network. These and similar issues should be discussed with the LECs early in the process.

Operationally, changes to technology have a human impact, and training is always required in order to mitigate those impacts. The Advisory Committee's Training Subcommittee should be consulted as this

work begins. It is possible that a server on the ESInet could hold training modules accessible to all PSAPs.

A new network will require new policies. Training of state and PSAP employees regarding the policies will be required, i.e., use of the system. Kimball recommends the E9-1-1 Program Office continue to use the Advisory Committee to work through this process.

Staffing at both the state and PSAP levels will need to be reviewed. At a minimum, IT staff will become much more important. It is understood that the state will include funds to the counties for 20 more IT staff across the state. It is recommended that the Advisory Committee work with the state to review additional staff needs at the local and state level. GIS/Mapping is a huge part of the new system. Accessing 9-1-1 is no longer done based solely on a fixed address. Mobility is the common factor in all of the new devices. Location identification is a large part of the new network and having staff to work on this will be important.

Easy access to 9-1-1 has increased the number of calls the system receives. Wireless data show the number of calls on a single accident in a busy part of town generates multiple calls. Maintaining call-answering standards require that staffing levels constantly is monitored within PSAPs. Kimball recommends that call-taker workload be monitored as the new network is rolled out to determine appropriate staffing levels.

The new network provides for far more information to be available to the call-taker and ultimately to the responding public safety personnel. That data must be controlled so that it does not become overwhelming. Software tools will need to be deployed on the network to assist the call-takers.

Many other network tools will become available. It is important that the E9-1-1 Program Office and the Advisory Committee work together to put policy in place to determine how software or hardware is allowed to be added to the network.

### **6.3 COSTS**

The current costs of providing 9-1-1 service statewide are funded by the 9-1-1 excise taxes and other local sources. This report was to examine the costs and current revenues in relation to the transition and operation of a NG9-1-1 system. As the costs were examined, it appeared that the current funding levels did not fully cover the costs of delivering 9-1-1 today.

The NG9-1-1 transition period of 2009 to 2013 will involve increased capital costs and continued operation of the existing systems. After that time, from 2014 on, the information provided shows that maintenance costs could be expected to level out.

These costs are based on budgetary estimates that assume the purchase of a full ESInet architecture. Depending on the actual system selected and the procurement method, these costs may be different.

## 6.4 LEGISLATIVE

The USDOT NG9-1-1 System Initiative project published a preliminary transition plan to guide and assist government officials as they prepare for the transition to NG9-1-1. The section describing the purpose and scope of the document made the following statement:

*“...the NG9-1-1 Transition Plan can inform public policy officials at all levels of government on considerations for legislative or regulatory attention to ensure successful transition to NG9-1-1.”<sup>13</sup>*

Washington is not unique in understanding that there are problems with 9-1-1 funding and that solving those problems has to be a priority. The USDOT’s NG9-1-1 Transition Plan observes, *“While changes in funding priorities have been slow in coming, other developments suggest that the issue of 9-1-1 fees and sustainable revenue are being recognized at the state and local levels. State legislative and executive bodies are more frequently considering the alteration of legislation that would address declining funding and changing call patterns.”<sup>14</sup>*

The following paragraphs outline the legislative and regulatory changes that Washington should make for NG9-1-1 to be successful. Our recommendations include a long-term funding mechanism that accounts for inflation and helps provide financial stability for Washington’s 9-1-1 system. We have provided specific recommendations in Appendix D. We understand that the State E9-1-1 Program Office, the Advisory Committee and others will review Kimball’s recommendations and then draft language for a bill that will be introduced in the upcoming legislative session.

### 6.4.1 General

Kimball’s task was to provide specific recommendations for 9-1-1 funding legislation. Thus, we focused our attention on RCW 82.14B.020 and RCW 82.14B.030. We did not attempt to edit or update the rest of Chapter 82.14B RCW. We note that all of Chapter 82.14B RCW will need to be updated to make it consistent with the recommended changes to RCW 82.14B.020 and RCW 82.14B.030. The Legislature will determine which of Kimball’s recommendations is most appropriate based on the course of action it prefers.

### 6.4.2 Definitions

We recommend six new definitions in Chapter 82.14B RCW:

- Interconnected VoIP service
- Interconnected VoIP service provider
- NG9-1-1
- ESInet
- Communication service
- Communication service provider

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<sup>13</sup> US Department of Transportation, Next Generation 9-1-1 System Initiative “NG9-1-1 Preliminary Transition Plan,” Washington, D.C. April 2008, Version 1.0. Page 1.

<sup>14</sup> Ibid, page 18.

We recommend changing the definition "Enhanced 9-1-1 telephone system" to "Enhanced 9-1-1 system" to reflect the fact that E9-1-1 has evolved beyond traditional telephones.

We further recommend amending RCW 82.32.515, applicability of telephone and telecommunications definitions, to make the definitions apply to RCW 82.14B. We recommend that the definition of "telecommunications service" in RCW 80.04.010 have the meaning ascribed to it in RCW 82.04.065. These recommendations are intended to modernize and broaden the language to which the E9-1-1 excise tax applies.

We understand that adding such definitions may have implications for other statutes unrelated to 9-1-1; therefore, we recommend a thorough legal review of this recommendation. If the state decides to adopt this recommended definition, the DOR will identify the entities that will be subject to the tax.

### **6.4.3 9-1-1 Excise Tax Assessment**

Kimball recommends consideration of language that would apply the E9-1-1 excise tax in a technologically neutral manner on all current and future devices and services users reasonably expect should provide them with access to 9-1-1. Appendix A contains an example developed from several other states' attempts to do this.

We note the current dispute between Washington State and the prepaid wireless service providers regarding the applicability of the 9-1-1 tax to prepaid wireless users. We strongly recommend that the state re-enforce the collection of the 9-1-1 excise tax from prepaid wireless users. Based on our estimates of the number of potential prepaid wireless users in Washington State, we estimate these subscribers would contribute \$1,523,846 per year to the State and \$3,809,616 per year to the counties at the current 9-1-1 tax rate.

It is, at its heart, a matter of fairness. Right now, some consumers—based solely on their technology or service—subsidize other consumers who use technologies or services that do not contribute to the cost of the 9-1-1 system. Yet, all benefit equally from that system. It is Kimball's belief that the additional revenue will help keep the excise tax as low as possible by reducing the need for future tax increases upon the dwindling number of consumers who are subsidizing the growing number of other consumers that do not contribute.

### **6.4.4 Tax Rate, Maximum Tax and Inflation Adjustment**

Kimball developed a calculator for the tax rate based on the current known number of potentially taxable devices. This tool enabled us to project revenues at different tax rates, thereby estimating what rate would be necessary to cover current costs, NG9-1-1 transition costs, and NG9-1-1 operations and maintenance costs. We did not attempt to estimate a rate of growth or decline in the use of specific technologies.

Kimball's cost projections included a 2.12 percent annual rate of inflation consistent with the trend information from the OFM. It is desirable to establish a maximum authorization in the interest of not returning to the legislature every year, so we identified an appropriate maximum excise tax for the cost estimates. Kimball averaged the cost estimates for fiscal years 2009 through 2016 for both the state and the counties. Using the calculator, we determined the tax rate needed to cover those cost estimates, and then averaged the tax rate to determine an appropriate maximum tax. We rounded all results to five-cent increments. Each of the recommended courses of action assumes that the Legislature will agree with our

previous recommendation to assess the 9-1-1 excise tax not only on switched access landlines and radio access lines, but also on all types of VoIP and any future device capable of communicating with 9-1-1. We generated the numbers below based on the 9-1-1 excise taxes on switched access landlines, radio access lines, and all types of VoIP.

One course of action would be for the Legislature to fund the one-time implementation costs of \$58.7<sup>15</sup> million from a source other than the Enhanced 9-1-1 account, and to maintain the current 9-1-1 excise tax structure (except to modify legislation to assure that all potential technologies capable of calling 9-1-1 are taxed at the established rates). There is a risk associated with this option, since it is not possible to determine the precise number of devices that are not currently paying the tax. There is also an assumption associated with this option: the implementation of NG9-1-1 will be closely coordinated to minimize the length of the transition period when both the current E9-1-1 system and the new NG9-1-1 system will be operating in parallel. We cannot underestimate the importance of this: there is a direct relationship between the length of the transition and the cost of the transition. Therefore, Kimball assumes that all parties will be willing to cooperate and coordinate to reduce the amount of time the transition will take. Again, this tax level would not cover costs currently paid for using county general funds or user fees.

A second course of action would be to fund the incremental costs of NG9-1-1 using tax revenue generated from an increase in the current state and local excise tax rate charged on devices. To fully fund Kimball's projected one-time capital costs, transitional costs, and future operational costs for fiscal years 2009-2016, the current state excise tax would need to be raised from 20 cents per device per month to 25 cents per device per month and from 50 cents per device per month to 65 cents per device per month at the county level. Again, this tax level would not cover costs currently paid for using county general funds or user fees.

A third course of action would be to fully fund all state and local 9-1-1 costs historically associated with 9-1-1 operations from the 9-1-1 excise taxes. As we previously reported, local 9-1-1 officials and stakeholders have expressed support for such a concept, because nearly 64 percent of the cost to provide 9-1-1 service comes from other funding sources, such as the general fund and user fees. If this option were chosen, fully funding current E9-1-1 costs, transitional costs and ongoing NG9-1-1 operational costs would require the state tax to be raised from 20 cents to 25 cents per device per month and the county tax to be raised from 50 cents to \$1.75 per device per month.

If there should ever be a significant deviation from the actual inflation trend, the state may choose to revisit the matter at that time.

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<sup>15</sup> The \$58.7 million in transition costs is the sum of \$23.8 million in NG9-1-1 capital costs plus \$34.9 million in NG9-1-1 recurring costs required through the transition period.

## **7. CONCLUSION**

In conclusion, Kimball has outlined the actions the State could take to ensure the success of its NG9-1-1 initiative. Our recommendations involve approaches to funding NG9-1-1, and changes to legislation that would apply the E9-1-1 excise tax in a technologically neutral manner on all current and future devices that users reasonably expect should provide them with access to 9-1-1. It has been our pleasure to help you with this study, and wish you the very best as you move Washington State's E9-1-1 system into the next generation.

## Appendix A–Glossary and Acronyms

Term	Definition
Association of Public-Safety Communications Officials (APCO)	APCO is the world's oldest and largest not-for-profit professional organization dedicated to the enhancement of public safety communications.
Automatic Location Information (ALI)	The automatic display at the PSAP of the caller's telephone number, the information of the location from which a call originates.
Automatic Number Identification (ANI)	Telephone number associated with the access line from which a call originates.
Centralized Automatic Message Accounting (CAMA)	A type of in-band analog transmission protocol that transmits telephone number via multi-frequency encoding. Originally designed for billing purposes.
Computer Aided Dispatch (CAD)	A computer based system, which aids PSAP telecommunicators by automating selected dispatching and record keeping activities.
Emergency Notification System (ENS)	General category for any systems used to notify persons of an emergency. May include changeable message signs, sirens, telephone and other media.
Emergency Services IP Network (ESINet)	An IP-based inter-network (network of networks) shared by all agencies which may be involved in any emergency.
Emergency Services Routing Proxy(ESRP)	An i3 functional element which is a SIP proxy server that selects the next hop routing within the ESINet based on location and policy. There is an ESRP on the edge of the ESINet. There is usually an ESRP at the entrance to an MG9-1-1 PSAP. There may be one or more intermediate ESRPs between them.
Geographic Information System (GIS)	A computer software system that enables one to visualize geographic aspects of a body of data. It contains the ability to translate implicit geographic data (such as a street address) into an explicit map location. It has the ability to query and analyze data in order to receive the results in the form of a map. It also can be used to graphically display coordinates on a map i.e. Latitude/Longitude from a wireless 9-1-1 call.
Global Positioning System (GPS)	A satellite based Location Determination Technology (LDT).
Incumbent Local Exchange Carrier (ILEC)	A telephone company that had the initial telephone company franchise in the area.
Internet Protocol (IP)	The method by which data is sent from one computer to another on the Internet or other networks.
Landline	Colloquial term for the Public Switched Telephone Network access via an actual copper or fiber optic transmission line that travels underground or on telephone poles. Used to differentiate the "wireless" connectivity of a cellular or PCS system.
Local Exchange Carrier (LEC)	A Telecommunications Carrier (TC) under the state/local Public Utilities Act that provide local exchange telecommunications services. Also known as Incumbent Local Exchange Carriers (ILECs), Alternate Local Exchange Carriers (ALECs), Competitive Local Exchange Carriers (CLECs), Competitive Access Providers (CAPs), Certified Local Exchange Carriers (CLECs), and Local Service Providers (LSPs).
Location to Service Translation Protocol (LoST)	A protocol that takes location information and a Service URN and returns a URI. Used generally for location based call routing. In NG9-1-1, used as the protocol for the ECRF and LIVE
Master Street Address Guide (MSAG)	A data base of street names and house number ranges within their associated communities defining Emergency Service Zones (ESZs) and their associated Emergency Service Numbers (ESNs) to enable proper routing of 9-1-1 calls.
Multi-Protocol Label Switching (MPLS)	A mechanism that allows network administrators to perform a measure of traffic engineering within their networks.

## Appendix A.1 - Glossary

National Emergency Number Association (NENA)	The National Emergency Number Association is a not for-profit corporation established in 1982 to further the goal of “One Nation-One Number.” NENA is a networking source and promotes research, planning and training. NENA strives to educate, set standards and provide certification programs, legislative representation and technical assistance for implementing and managing 9-1-1 systems.
Next Generation 9-1-1 (NG9-1-1)	NG9-1-1 is the next evolutionary step in the development of the 9-1-1 emergency communications system known as E9-1-1 since the 1970s. NG9-1-1 is a system comprised of managed IP-based networks and elements that augment present-day E9-1-1 features and functions and add new capabilities. NG9-1-1 will eventually replace the present E9-1-1 system. NG9-1-1 is designed to provide access to emergency services from all sources, and to provide multimedia data capabilities for PSAPs and other emergency service
Open Systems Interconnection (OSI)	A 7-layer hierarchical reference model structure developed by the International Standards Organization for defining, specifying, and relating communications protocols; not a standard or a protocol; Layer Description – (7) Application Provides interface with network users, (6) Presentation Performs format and code conversion, (5) Session Manages connections for application programs, (4) Transport Ensures end-to-end delivery, (3) Network Handles network addressing and routing, (2) Data Link Performs local addressing and error detection and (1) Physical Includes physical signaling and interfaces
Personal Digital Assistant (PDA)	Small, handheld device used to store address book information, telephone numbers, personal contacts and other personal information.
Public Safety Answering Point (PSAP)	A set of call takers authorized by a governing body and operating under common management which receives 9-1-1 calls and asynchronous event notifications for a defined geographic area and processes those calls and events according to a specified operational policy.
Short Message Service (SMS)	A service typically provided by mobile carriers that sends short (160 characters or fewer) messages to an endpoint. SMS is often fast, but is not real time.
Telecommunications Service Provider (TSP)	A business that provides voice or data transmission services. These services are provided over a telecommunications network that transmits any combination of voice, video and/or data between users. A TSP could be, but is not limited to, a Local Exchange Carrier (LEC), a wireless telecommunications provider, a Commercial Mobile Radio Service provider, or a PBX service provider.
Telematics	The system of components that supports two-way communications with a motor vehicle for the collection or transmission of information and commands.
Teletypewriter (TTY, Telecommunication Device for the Deaf)	Also know as TDD. A device capable of information interchange between compatible units using a dial up or private-line telephone network connections as the transmission medium. ASCII or Baudot codes are used by these units. (per EIA PN-1663)
Uninterruptible Power Supply (UPS)	A backup system designed to provide continuous power in the event of a commercial power failure or fluctuation.
Voice over Internet Protocol (VoIP)	Provides distinct packetized voice information in digital format using the Internet Protocol. The IP address assigned to the user’s telephone number may be static or dynamic.
Wireless	Means any Commercial Mobile Radio Service (CMRS) that falls under the FCC’s Docket 94-102 requirement for wireless enhanced 9-1-1 service.

Acronym	Definition
ALI	Automatic Location Information
ANI	Automatic Number Identification
APCO	Association of Public-Safety Communications Officials
CAD	Computer Aided Dispatch
CAMA	Centralized Automatic Message Accounting
CJTC	Criminal Justice Training Commission
CLEC	Competitive Local Exchange Carrier
CPD	Coordinator Professional Development
DOR	Department of Revenue
ENS	Emergency Notification System
ESINet	Emergency Services IP Network
ESRP	Emergency Services Routing Proxy
FCC	Federal Communication Commission
GIS	Geographic Information System
GPS	Global Positioning System
HSDC	Hearing, Speech and Deafness Center
IdAM	Identity and Access Management
ILEC	Incumbent Local Exchange Carrier
IP	Internet Protocol
ISO	International Standards Organization
IT	Information Technology
LEC	Local Exchange Carrier
LoST	Location to Service Translation Protocol
LVF	Location Validation Function
MPLS	Multi-Protocol Label Switching
MSAG	Master Street Address Guide
NENA	National Emergency Number Association
NG9-1-1	Next Generation 9-1-1
OFM	Office of Financial Management
OSI	Open Systems Interconnection
PDA	Personal Digital Assistant
PSAP	Public Safety Answering Point
RCW	Revised Code of Washington
RFP	Request for Proposals
SMS	Short Message Service
TTY	Teletypewriter (a.k.a. TDD, Telecommunication Device for the Deaf)
UPS	Uninterruptible Power Supply
USDOT	United States Department of Transportation
UTC	Utilities and Transportation Commission
VoIP	Voice over Internet Protocol
WAC	Washington Administrative Code

## Appendix B—Legislative Language

## APPENDIX B–KIMBALL’S RECOMMENDATIONS FOR LEGISLATION

### 82.14B.010 Definitions

Add the following definitions:

1. "Interconnected Voice-over-Internet Protocol service" or "Interconnected VoIP service" has the meaning ascribed to it in the Code of Federal Regulations, Title 47, Part 9, section 9.3, as amended.
2. "Interconnected Voice-over-Internet Protocol service provider" means an entity that provides interconnected voice over internet protocol service.
3. "NG911" means Next Generation 9-1-1, NG9-1-1 is a system comprised of network, hardware, software, data and operational policies and procedures to:
  - (a) provide standardized interfaces from call and message services;
  - (b) process all types of emergency calls including non-voice (multi-media) messages;
  - (c) acquire and integrate additional data useful to call routing and handling;
  - (d) deliver the calls/messages and data to the appropriate PSAPs and other appropriate emergency entities;
  - (e) support data and communications needs for coordinated incident response and management;
  - (f) provide a secure environment for emergency communications.
4. "ESInet" means Emergency Services Internet Protocol Network, an IP-based, multi-purpose inter-network (network of networks) supporting local, regional, state and national public safety communications services in addition to 911.
5. "Communication service" means any service or device that:
  - (a) Uses telephone numbers or Internet Protocol addresses or their functional equivalents or successors, and
  - (b) Is capable of accessing, connecting with, or interfacing with the 9-1-1 system by dialing, initializing, or otherwise activating the 9-1-1 system regardless of the transmission medium or technology employed; and
  - (c) Which provides or enables real-time or interactive communications.
6. "Communications service provider" means any entity that provides communication service.

Amend the following definition:

"Enhanced 911 (~~(telephone)~~) system" means (~~(a public telephone)~~) an emergency communication system consisting of a network, database, and on-premises equipment that is accessed by dialing, initializing, or otherwise activating 911 and that enables reporting police, fire, medical, or other emergency situations to a public safety answering point. The system includes the capability to selectively route incoming 911 calls to the appropriate public safety answering point that operates in a defined 911 service area and the capability to automatically display the name, address, and telephone number of incoming 911 calls at the appropriate public safety answering point.

Note: We understand that adding such definitions may have implications for other statutes unrelated to 9-1-1; therefore, we recommend a thorough legal review of this recommendation.

**82.14B.030 County enhanced 911 excise tax on use of switched access lines and radio access lines authorized—Amount—State enhanced 911 excise tax—Amount**

Amend the following provisions to read (the new excise tax amounts below are provided by way of example and reflect the third “course of action”):

(1) The legislative authority of a county may impose a county enhanced 911 excise tax on the use of switched access lines in an amount not exceeding (~~(fifty cents)~~) \$1.75 per month for each switched access line. The amount of tax shall be uniform for each switched access line. Each county shall provide notice of such tax to all local exchange companies serving in the county at least sixty days in advance of the date on which the first payment is due.

(2) The legislative authority of a county may also impose a county enhanced 911 excise tax on the use of radio access lines whose place of primary use is located within the county in an amount not exceeding (~~(fifty cents)~~) \$1.75 per month for each radio access line. The amount of tax shall be uniform for each radio access line. The county shall provide notice of such tax to all radio communications service companies serving in the county at least sixty days in advance of the date on which the first payment is due. Any county imposing this tax shall include in its ordinance a refund mechanism whereby the amount of any tax ordered to be refunded by the judgment of a court of record, or as a result of the resolution of any appeal therefrom, shall be refunded to the radio communications service company or local exchange company or interconnected VoIP service company that collected the tax, and those companies shall reimburse the subscribers who paid the tax. The ordinance shall further provide that to the extent the subscribers who paid the tax cannot be identified or located, the tax paid by those subscribers shall be returned to the county.

Add a new paragraph (3) to read as follows: The legislative authority of a county may also impose a county enhanced 911 excise tax on the use of interconnected VoIP service lines whose place of primary use is located within the county in an amount not exceeding (~~(fifty cents)~~) \$1.75 per month for each interconnected VoIP line or line equivalent. The county shall provide notice of such tax to all interconnected VoIP service companies with customers in the county at least sixty days in advance of the date on which the first payment is due.

(3) A state enhanced 911 excise tax is imposed on all switched access lines in the state. The amount of tax shall not exceed twenty-five cents per month for each switched access line. The tax shall be uniform for each switched access line. The tax imposed under this subsection shall be remitted to the department

of revenue by local exchange companies on a tax return provided by the department. Tax proceeds shall be deposited by the treasurer in the enhanced 911 account created in RCW 38.52.540.

(4) A state enhanced 911 excise tax is imposed on all radio access lines whose place of primary use is located within the state in an amount of twenty-five cents per month for each radio access line. The tax shall be uniform for each radio access line. The tax imposed under this section shall be remitted to the department of revenue by radio communications service companies, including those companies that resell radio access lines, on a tax return provided by the department. Tax proceeds shall be deposited by the treasurer in the enhanced 911 account created in RCW 38.52.540. The tax imposed under this section is not subject to the state sales and use tax or any local tax.

[Add the following after paragraph (4)] A state enhanced 911 excise tax is imposed on all interconnected VoIP service lines whose place of primary use is located within the state in an amount of twenty-five cents per month for each interconnected VoIP service line. The tax shall be uniform for each interconnected VoIP service line. The tax imposed under this section shall be remitted to the department of revenue by interconnected VoIP service companies, including those companies that resell VoIP service, on a tax return provided by the department. Tax proceeds shall be deposited by the treasurer in the enhanced 911 account created in RCW 38.52.540. The tax imposed under this section is not subject to the state sales and use tax or any local tax.

(5) By August 31st of each year the state enhanced 911 coordinator shall recommend the level for the next year of the state enhanced 911 excise tax imposed by subsection (3) of this section, based on a systematic cost and revenue analysis, adjusted for inflation, to the utilities and transportation commission. The commission shall by the following October 31st determine the level of the state enhanced 911 excise tax for the following year.

Note: We understand that these changes will require commensurate changes elsewhere in Chapter 82.14B RCW not directly relating to the purpose of this project.

## Appendix C–Data



### Appendix C 1 - State Costs

		2008	2009	2010	2011	2012	2013	2014	2015	2016
State 9-1-1 Costs	Selective Routing*	\$1,306,191	\$1,333,883	\$1,362,161	\$1,391,039	\$1,420,529	\$1,450,644			
	Interdandem*	\$155,874	\$159,179	\$162,554	\$166,000	\$169,519	\$173,113			
	Frame Relay*	\$736,646	\$752,263	\$768,211	\$784,497	\$801,128	\$818,112			
	Switching Office Enabling*	\$1,152,521	\$1,176,954	\$1,201,905	\$1,227,386	\$1,253,406	\$1,279,979			
	ALI/DMS Database*	\$4,269,272	\$4,359,780	\$4,452,208	\$4,546,594	\$4,642,982	\$4,741,413			
	LEC Interface & Wireless Database*	\$458,608	\$468,330	\$478,259	\$488,398	\$498,752	\$509,325			
	Night Service*	\$116,601	\$119,073	\$121,597	\$124,175	\$126,808	\$129,496			
	Lanaguage Line*	\$88,541	\$90,418	\$92,335	\$94,292	\$96,291	\$98,333	\$100,417	\$102,546	\$104,720
	State Office Expenditures (Training, etc)*	\$2,001,552	\$2,033,352	\$2,076,459	\$2,120,480	\$2,165,434	\$2,211,341	\$2,258,222	\$2,306,096	\$2,354,985
	State Reimbursement**	\$6,557,311	\$6,696,326	\$6,838,288	\$6,983,260	\$7,131,305	\$7,282,489	\$7,436,877	\$7,594,539	\$7,755,543
NG9-1-1 Costs	Addition IT Staff per County***			\$1,200,000	\$1,225,440	\$1,251,419	\$1,277,949	\$1,305,042	\$1,332,709	\$1,360,962
	NG9-1-1 Pilot Project		\$1,300,000							
	Border Gateway Functions Non-Recurring Costs			\$1,050,000	\$0	\$0	\$0	\$0	\$0	\$0
	Border Gateway Functions Recurring Costs			\$795,600	\$795,600	\$795,600	\$795,600	\$795,600	\$795,600	\$795,600
	ESRP Functions Non-Recurring Costs			\$5,450,000	\$5,450,000	\$0	\$0	\$0	\$0	\$0
	ESRP Functions Recurring Costs			\$302,400	\$2,532,000	\$2,532,000	\$2,532,000	\$2,532,000	\$2,532,000	\$2,532,000
<b>Total State Costs</b>		<b>\$16,843,117</b>	<b>\$18,489,558</b>	<b>\$26,351,977</b>	<b>\$27,929,161</b>	<b>\$22,885,174</b>	<b>\$23,299,795</b>	<b>\$14,428,159</b>	<b>\$14,663,490</b>	<b>\$14,903,811</b>
Total State Excise Tax Need Based on estimated current subscribers	N/a		\$0.20	\$0.30	\$0.30	\$0.25	\$0.25	\$0.20	\$0.20	\$0.20
Total State Excise Tax Need With VoIP and Uncollected Prepaid Wireless	N/a		\$0.20	\$0.30	\$0.30	\$0.25	\$0.25	\$0.15	\$0.15	\$0.15

\*Includes 2.12% inflation adjustment

\*\* Reimbursement to Counties for approved expenses

\*\*\*IT Staff cost for 20 Counties = \$60,000 per County and inflation adjustment



### Appendix C 2 - County Costs

		2008	2009	2010	2011	2012	2013	2014	2015	2016
Statewide Dialing Costs*		\$17,440,939	\$19,721,548	\$20,139,645	\$20,566,606	\$21,002,618	\$21,447,873	\$21,902,568	\$22,366,903	\$22,841,081
Basic Services*		\$133,627,898	\$136,621,036	\$139,517,402	\$142,475,171	\$145,495,645	\$148,580,152	\$151,730,052	\$154,946,729	\$158,231,599
Capital Costs*		\$4,867,006	\$4,993,642	\$5,099,507	\$5,207,617	\$5,318,018	\$5,430,760	\$5,545,892	\$5,663,465	\$5,783,531
Other PSAP Costs*		\$239,035	\$210,427	\$214,888	\$219,444	\$224,096	\$228,847	\$233,698	\$238,653	\$243,712
State Reimbursement**		(\$6,557,311)	(\$6,696,326)	(\$6,838,288)	(\$6,983,260)	(\$7,131,305)	(\$7,282,489)	(\$7,436,877)	(\$7,594,539)	(\$7,755,543)
NG9-1-1 Costs	PSAP Call Termination Function Non-Recurring Costs			\$0	\$3,956,667	\$3,956,667	\$3,956,667	\$0	\$0	\$0
	PSAP Call Termination Function Recurring Costs			\$0	\$3,084,000	\$6,168,000	\$9,634,800	\$9,634,800	\$9,634,800	\$9,634,800
<b>Total Costs</b>		<b>\$149,617,567</b>	<b>\$154,850,327</b>	<b>\$158,133,154</b>	<b>\$168,526,244</b>	<b>\$175,033,738</b>	<b>\$181,996,611</b>	<b>\$181,610,133</b>	<b>\$185,256,010</b>	<b>\$188,979,180</b>

Total State Excise Tax Need Based on estimated current subscribers	N/a	\$1.70	\$1.70	\$1.85	\$1.90	\$1.95	\$1.95	\$2.00	\$2.05
Total State Excise Tax Need With VoIP and Uncollected Prepaid Wireless	N/a	\$1.55	\$1.55	\$1.65	\$1.75	\$1.80	\$1.80	\$1.85	\$1.85

Components of the line items is contained in the Washington Military Department - Emergency Management Department 911 County Contract

\*Includes 2.12% inflation adjustment

\*\* Reimbursement to Counties for approved expenses

### Appendix C.3 - Cost and Deployment

	2010	2011	2012	2013	2014	2015	2016
<a href="#">Border Gateway Functions Non-Recurring Costs</a>	\$1,050,000	\$0	\$0	\$0	\$0	\$0	\$0
<a href="#">Border Gateway Functions Recurring Costs</a>	\$795,600	\$795,600	\$795,600	\$795,600	\$795,600	\$795,600	\$795,600
<a href="#">ESRP Functions Non-Recurring Costs</a>	\$5,450,000	\$5,450,000	\$0	\$0	\$0	\$0	\$0
<a href="#">ESRP Functions Recurring Costs</a>	\$302,400	\$2,532,000	\$2,532,000	\$2,532,000	\$2,532,000	\$2,532,000	\$2,532,000
<a href="#">PSAP Call Termination Function Non-Recurring Costs</a>	\$0	\$3,956,667	\$3,956,667	\$3,956,667	\$0	\$0	\$0
<a href="#">PSAP Call Termination Function Recurring Costs</a>	\$0	\$3,084,000	\$6,168,000	\$9,634,800	\$9,634,800	\$9,634,800	\$9,634,800
<b>Total Non-Recurring Costs</b>	\$6,500,000	\$9,406,667	\$3,956,667	\$3,956,667	\$0	\$0	\$0
<b>Total Recurring Costs</b>	\$1,098,000	\$6,411,600	\$9,495,600	\$12,962,400	\$12,962,400	\$12,962,400	\$12,962,400
<b>TOTAL</b>	<b>\$7,598,000</b>	<b>\$15,818,267</b>	<b>\$13,452,267</b>	<b>\$16,919,067</b>	<b>\$12,962,400</b>	<b>\$12,962,400</b>	<b>\$12,962,400</b>





Appendix C.6 - PSAP Call Termination Functions

PSAP Call Termination Functions Non-Recurring Costs			\$0	\$3,956,667	\$3,956,667	\$3,956,667	\$0	\$0	\$0
Item	Description	Assumptions	2010	2011	2012	2013	2014	2015	2016
PSAP Workstations	Workstation Hardware	6,270,000		2,090,000	2,090,000	2,090,000			
PSAP Workstations	Workstation Software	4,100,000		1,366,667	1,366,667	1,366,667			
PSAP Workstations	Installation/Professional Services	1,500,000		500,000	500,000	500,000			

PSAP Call Termination Functions Recurring Costs			\$0	\$3,084,000	\$6,168,000	\$9,634,800	\$9,634,800	\$9,634,800	\$9,634,800
Item	Description	Assumptions	2010	2011	2012	2013	2014	2015	2016
DS-1 PSAP	Connection to an estimated 67 individual PSAPs. 61 will have two DS-1's, 6 will have 4 DS-1's.	146 @ 900		529,200	1,058,400	1,576,800	1,576,800	1,576,800	1,576,800
DS-1 PSAP Redundancy	These provide connectivity between neighboring PSAPs for redundancy. 6 sites will require 3 additional.	85 @ 1000		336,000	672,000	1,020,000	1,020,000	1,020,000	1,020,000
End Site Router	24 Ports with POE, 6 sites require 2.	80 @ 200		67,200	134,400	192,000	192,000	192,000	192,000
End Site Firewall	Managed Firewall for each end site with 48 port switch	70 @ 650		171,600	343,200	546,000	546,000	546,000	546,000
Site Maintenance	Maintenance on 67 sites	70 @7500		1,980,000	3,960,000	6,300,000	6,300,000	6,300,000	6,300,000