

# Analysis of the E9-1-1 Challenge

December 2003

Prepared by **MONITOR GROUP**

# 911



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# 1 Preface

## *Origins of this Document*

In late summer 2002, the National Emergency Number Association (NENA) convened a new forum, the Strategic Wireless Action Team (SWAT), bringing together the public and private sector organizations and professionals responsible for the delivery of 9-1-1. The purpose of SWAT is to help close a significant gap in the nation's safety net, by facilitating the completion of a nation-wide enhanced 9-1-1 (E9-1-1) infrastructure, enabling 9-1-1 call centers to accurately locate wireline or wireless callers. SWAT is designed to deploy appropriate resources, and to provide guidance to identify technologies, tools, and expertise needed to assure consistent delivery of 9-1-1 throughout the country. As a part of its activities, SWAT launched the E9-1-1 Stakeholders Initiative to identify, evaluate and recommend specific ways to accelerate the ubiquitous deployment of wireless E9-1-1.<sup>1</sup> Monitor Group, a global strategy advisory firm, was contracted by NENA to play the role of objective third-party expert, researcher and advisor to the Initiative, and to facilitate the ensuing multi-party dialogue.

As a part of the activities of the SWAT effort, it was critical to undertake a significant amount of analysis to identify, frame and provide rich data around the fundamental issues requiring resolution to achieve a timely deployment of E9-1-1 nationwide. The purpose of this document is to make available the results of that analysis, framed and undertaken by Monitor Group and NENA SWAT, and specifically to enable informed choice for public and private sector decision-making for E9-1-1. *This document does not represent the individual or collective views of the participants of the Stakeholders' Initiative*, nor does it in any way reflect the findings of that Initiative; rather, it solely reflects the data and analyses of E9-1-1 as framed by Monitor Group.

## *Related Undertakings*

A critical point of departure for the SWAT effort was the findings and recommendations contained in the FCC sponsored report by Dale Hatfield ("The Hatfield Report"), October 2002<sup>2</sup>. In his report, Mr. Hatfield highlighted several important findings on key barriers to E9-1-1 deployment. It would be fair to describe the Hatfield report and the findings emerging from the SWAT effort as highly complementary. In addition, the different approaches taken by the two initiatives help validate each other's findings and conclusions.

Another key point of connection is the pending E9-1-1 legislation in Congress, for which much of the analysis in this document is complementary.<sup>3</sup>

The analysis in this document also builds on and/or is complementary to a variety of other E9-1-1 initiatives including:

- The FCC E911 Coordination Initiative
- The DOT's Secretarial Initiative
- NENA's Report Card to the Nation
- APCO's Project LOCATE
- ESIF

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<sup>1</sup> In August 2002 NENA received a grant from Wireless E-911: The PSAP Readiness Fund, a non-profit organization with an independent board of directors created by Nextel Communications, Inc. Through this grant, NENA launched the SWAT effort, and under SWAT's auspices, the E9-1-1 Stakeholders' Initiative. The findings and implications of the E9-1-1 Stakeholders' Initiative can be found separately in a document, entitled "Summary Findings of the NENA SWAT E9-1-1 Stakeholders' Initiative", December 2003; that document represents Monitor Group's interpretation of the findings and implications emanating from the Initiative and resulting from the multi-party discussions. As such, it does not represent Monitor Group's professional recommendations or opinions. Similarly, no explicit or implied endorsement by any of the contributors, participants, or sponsors should be inferred for any particular finding or implication contained in the document.

<sup>2</sup> *A report on the Technical and Operational Issues Impacting the Provision of Wireless Enhanced 911 Services*, Dale N. Hatfield, October 2002, FCC WT Docket No. 02-46.

<sup>3</sup> See Senate bill, S.1250, "The Enhanced 911 Emergency Act of 2003" (pending) and House bill H. R. 2898 the "E-911 Implementation Act of 2003" (passed November 4<sup>th</sup>, 2003).

## *The Road Ahead*

Follow-through on the findings and implications of the Stakeholders Initiative and the analyses contained in this document will require continued attention, by all parties interested in E9-1-1 deployment, to:

- Coordination with current and pending legislation;
- Planning and operational implementation work;
- Monitoring of, and reporting on, deployment progress;
- Creating practical tools and drawing on best practices, to aid implementation at the state and local level;
- Developing education and public awareness building campaigns.

Among the most immediate challenges is the launch of a broad-based awareness building, education and advocacy campaign aimed at not only the general public, but also policymakers, and the grass-roots public safety community. As a part of such a campaign, there will likely be an ongoing need to develop data and analyze progress to help regulators and policy makers and stakeholders refine their choices, for instance in updating funding requirements and in tracking PSAP readiness. Similarly, to help overcome the significant challenge of driving change at the local level — particularly given the sheer enormity of the task — a more detailed understanding of consumers' attitudes about E9-1-1 features and deployment issues would no doubt be helpful not to mention the difficulty of swaying opinions when there is a lack of political will for E9-1-1. Unfortunately, often the most powerful awareness and education mechanism is from a tragedy that could have been avoided given full E9-1-1 deployment.

In addition, of the many topics addressed by the Initiative, further work remains to:

- Address future proofing to ensure continued viability and ongoing evolution of the 9-1-1 system;
- Define rural requirements that drive progress towards E9-1-1 deployment, and appropriately recognize legitimate constraints to deployment in specific situations;
- Resolve concerns by some regarding a mechanism for WSPs to recover costs in a manner deemed fair by all parties.

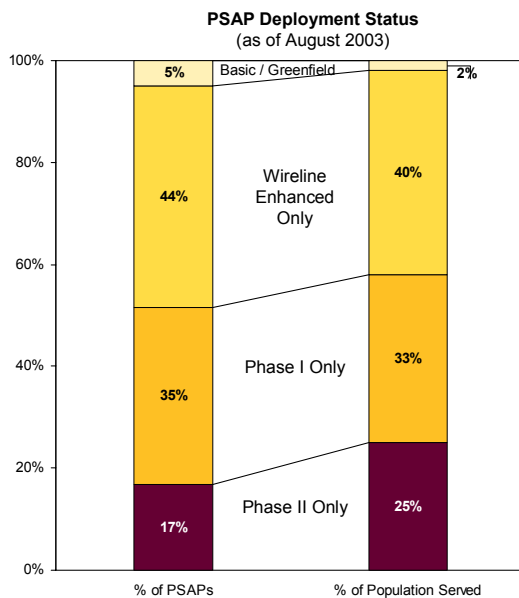
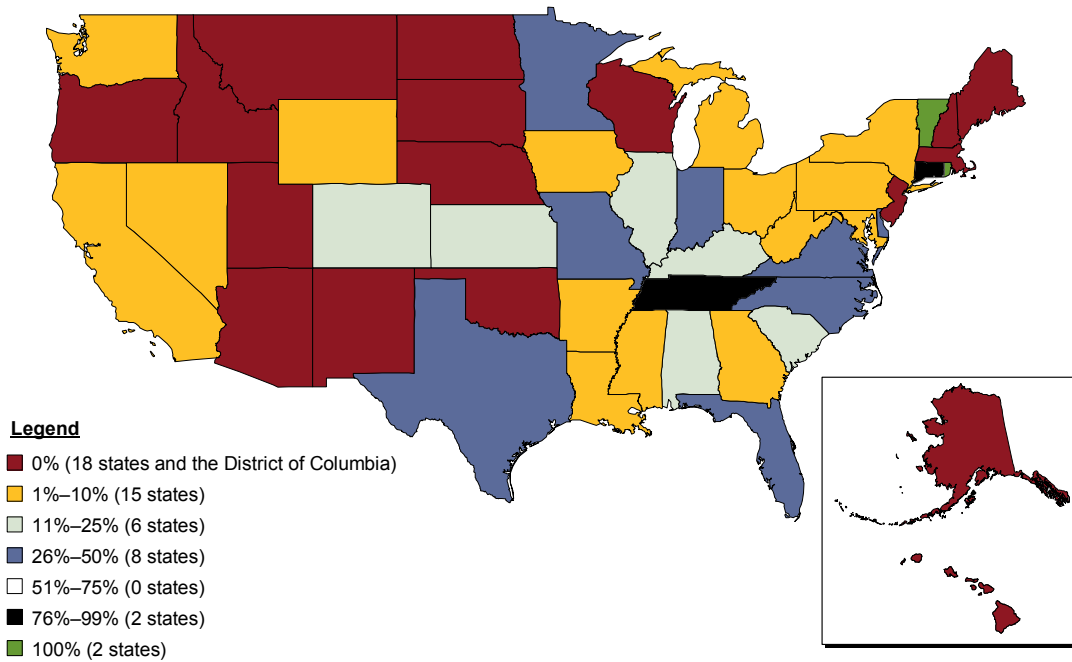
The future evolution of the 9-1-1 system is an important challenge to begin addressing today. Tackling this issue now represents not just an opportunity to jump start the future, but an imperative to avoid problems similar to those faced today, several years hence. The challenge here is that technological progress, while swift, does not always take hold in a coordinated fashion given the fragmented, multi-party nature of the system. And external factors and events — which will continue to raise and change the nature of the features needed by our public safety, national security and national emergency preparedness infrastructure — further complicate that challenge. What is required is a definition of the common purpose and the mutual benefit likely to be conferred on the parties who show leadership.

In our experience, the process used by both SWAT and the Stakeholders Initiative — that of convening regular venues for collective discussion — was a healthy one. This should be continued in some fashion not only on specific focused topics such as rural requirements and future proofing, but also on both broader ongoing management of the 9-1-1 system as issues arise and deployment of E9-1-1.

Despite the challenges ahead, we remain optimistic about continued forward progress. While there will no doubt be potholes in the road ahead, we believe this to be an enormously productive process, and likely the best opportunity to materially advance the cause of E9-1-1 ubiquity. For the progress to date, and for that which is to come, we acknowledge and thank all the constituent members of the E9-1-1 Stakeholders' Initiative for their efforts in the service of our nation's public safety.

December 2003, Monitor Group.

**Percentage of PSAPs Deployed to Phase II, by State (August, 2003)**



**Other 9-1-1 and PSAP Statistics**

- Annual 9-1-1 Calls: ~ 200MM
- % of 9-1-1 Wireless Calls: ~33%
- Total PSAPs: 6,747
- % of U.S. population covered by 9-1-1: 98%
- % of U.S. population covered by Wireless E9-1-1 Phase II: 25%
- Number of counties without any 9-1-1 coverage: 333

## 2 Document Overview

During 2003, public safety and industry have together made great strides in the deployment of Wireless E9-1-1 Phase II technology, with the percentage of PSAPs that are fully Phase II capable rising from 4% at year end 2002 to 17% by August 2003.<sup>4</sup> However, despite this progress, more than 75% of the population remains uncovered and many challenges to nationwide deployment remain. As described in Section 3, the fundamental issues which underlay the E9-1-1 challenge include: involvement of and coordination between multiple parties in deployment - each with limited leverage over the other parties, substantial heterogeneity and complexity in the PSAP environment, and competing political and macroeconomic priorities. As a part of the effort to parse each of these issues into manageable topics around which action can be taken, this document provides objective data and analysis in seven key areas which are summarized below.

### *1. Wireless E9-1-1 Funding and Recovery*

Approximately \$2.3 billion is collected annually from dedicated 9-1-1 funding sources, while the estimated annualized system costs related to 9-1-1 and wireline and wireless E9-1-1, both Phase I and Phase II, amount to \$6.1+ billion. Thus, at a 9-1-1 system level, there is a funding gap of \$3.8+ billion. Over the past 3 years, diversions of at least \$400MM across 13 states have further exacerbated the E9-1-1 funding situation. While local appropriations help to offset the gap to the degree required to maintain basic operations, necessary upgrades to the system are chronically under funded. The portion of this gap that is specifically attributable to Wireless E9-1-1 is at least \$810 million annually. Although several alternatives for improving system cost efficiency were examined, including PSAP reconfiguration, LATA boundary relief and network reconfiguration, such efforts would not materially address the funding gap with respect to wireless E9-1-1 deployment. Section 4 of this document provides detailed analysis of E9-1-1 costs and funding.

Monitor Group also conducted a large scale nationwide survey which found that 98% of the general public believe that wireless E9-1-1 is at least as important as or more important than other public safety priorities. Further survey results including usage of 9-1-1 and perspectives on sources of funding are presented in Section 12.

### *2. State and Federal Coordination and Oversight*

Coordination is an essential element to timely and efficient deployment of wireless E9-1-1. However, no single federal entity currently oversees all aspects of nationwide deployment and, of the 50 states and Washington D.C., only 33 currently have any form of coordination office in place. Provision of public safety remains a highly localized and decentralized effort.

Section 5 details Monitor Group's review through case studies of several state coordination mechanisms and supporting state legislation. Insights may also be extracted from analogies of other federal coordination initiatives. In addition, Section 11 provides a quantitative assessment of the many factors driving Wireless E9-1-1 deployment, including the impact of coordination.

### *3. PSAP Environment, Archetypes, and Deployment Timeline Projections*

At the current pace of progress, and assuming the current deployment and related policy environment remain in place, Monitor Group estimates that less than 50% and less than 70% of PSAPs will be Phase II capable by 2005 and 2007 respectively. Monitor Group's analysis of the PSAP Environment in Section 6 maps the nation's 6,700 PSAPs into archetypes based on motivators and barriers to deployment and outlines the detailed assumptions underlying these PSAP deployment timeline projections.

### *4. Wireless Carrier Deployment Timeline Considerations*

Although new factors such as LNP may come into play, Monitor Group's preliminary analysis of the current trajectory of handset replacement suggests that due to changes in the economic environment and other factors

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<sup>4</sup> As of the August 2003 WSP quarterly filings with the FCC. Please see Section 6 for more information.

affecting the wireless industry, that the industry as a whole is unlikely to reach 95% Phase II handset penetration until mid-2007 (with the caveat that each carrier is impacted differently). Strict enforcement of handset-penetration mandates could result in the unintended consequence of forcing consumers to surrender legacy handsets. Section 7 provides further details around wireless timeline considerations and also reviews precedents related to federally mandated, forced replacement of consumer products.

### *5. Rural Requirements*

Carriers serving rural areas also face considerable challenges in meeting accuracy and deployment timeline requirements. Operators in truly rural areas face the difficult choice of investing in building out their networks to extend wireless coverage and enable delivery of basic 9-1-1 calls or financing E9-1-1 upgrades to attempt to improve accuracy for existing coverage areas. Section 8 provides a brief summary of several options to address rural accuracy issues.

### *6. Future Proofing*

Numerous emerging end-user devices and commercial network technologies show considerable promise in improving the quality of 9-1-1 services. The challenge is to accelerate deployment of current technology such as Wireless Phase II without hampering or precluding the incorporation of other new infrastructure, functionality or devices into the 9-1-1 system. An outline of the NENA SWAT Technical Team's Future Evolution Path (FEP) is presented in Section 9. It provides a starting point for examination of these issues. Additionally, several policy considerations are presented to inform ongoing consideration of these issues.

### *7. Policy Leadership and Grassroots Education*

Strong state-level leadership models for 9-1-1 are important for effective and timely E9-1-1 deployment. Similarly, grassroots education and awareness building are a strong complement to any coordination effort, helping to inform relevant officials and the public at large on the importance of wireless E9-1-1. Section 10 provides additional perspective on policy leadership and grassroots education, drawing on positive models and experiences from a number of states.

### *8. Other Analyses*

Sections 11, 12 and 13 contain other important analyses conducted over the course of the SWAT initiative. Section 11 contains a multi-variate regression analysis of the factors associated with Phase II deployment. While the analysis, on its own, does not imply causality of specific factors, the strong correlation of several of the factors is nonetheless highly informative. Section 12 summarizes key findings of a survey of the general public on attitudes and awareness of E9-1-1. The survey represents a snapshot of public views at a single point in time, and highlights the importance of E9-1-1 among other national priorities. Section 13 summarizes a range of broad options for addressing current E9-1-1 challenges. No recommendations are put forth for any particular option; however the discussion of the spectrum of ideas and challenges associated with each option can serve as a thought-starter for future efforts to advance E9-1-1 deployment.

\* \* \* \*

In the course of examining the topics outlined above, many new bodies of knowledge on the E9-1-1 domain were created and the balance of this document should serve as a reference guide for those involved in policymaking for and implementation of E9-1-1. However, there are several areas worthy of further attention and analysis as mentioned in the Preface of this document.



### 3 Context, Fundamental Issues and Framework for Analysis

#### *Context and Fundamental Issues*

Considerable progress has been made in E9-1-1 deployment, and in particular wireless E9-1-1 Phase II, but significant hurdles remain for ubiquitous deployment. As evidence of the ongoing challenge, despite substantial efforts by many parties, less than 80% of the nation's population will have access to wireless Phase II<sup>5</sup> coverage by year end 2007. This represents a critical vulnerability in the nation's public safety capability, particularly salient in a post-9/11 environment, and is manifested on three levels: The personal safety of the citizenry; the assistance citizens provide *to others* in emergencies; and national and homeland security. A recent Monitor Group survey found that fully 98% of the general public believe that E9-1-1 is at least as important as, or more important than, other public safety priorities. The same survey found that 71% of all wireless 9-1-1 calls were to help others in need, and 14% of these calls were to notify authorities of larger public safety incidents such as fires and damage to infrastructure. 58% also believe that the importance of the 9-1-1 system overall has grown significantly with the increased attention given to homeland security<sup>6</sup>. In addition, the President's National security Telecommunications Advisory Committee (NSTAC) has previously cited the importance of a reliable E9-1-1 caller location capability in support of mission critical national security / emergency preparedness operations.<sup>7</sup>

The E9-1-1 deployment challenge is characterized by three fundamental issues which policy makers addressing the E9-1-1 issue should bear in mind:

- First, E9-1-1 deployment depends on upgrading decisions to be made by multiple parties: The wireless service providers (WSPs), the system service providers (SSPs)<sup>8</sup> and the Public Safety Answering Points (PSAPs), along with a host of other enabling parties. Each of these parties has little leverage over the others. This suggests the need to create a coordinated set of inter-connected incentives (i.e., "carrots") and requirements (i.e., "sticks") across all critical parties, rather than focusing national E9-1-1 policy requirements and mandates primarily on a sub-set of the parties.
- Second, there is substantial heterogeneity and complexity in PSAP environments. When combined with the highly decentralized nature of the public safety infrastructure — there are over 6,700 PSAPs — significant technical, operational, coordination, and monitoring challenges arise, affecting wireline and wireless services providers, PSAPs and coordinating functions. Viable solutions to the E9-1-1 challenge must respect PSAPs' diversity while attempting to manage the complexity of their environments.
- Third, any approach to addressing the E9-1-1 deployment question must be mindful of existing political and macroeconomic realities, many of which compete with each other. There are several such realities that are germane: State and federal budget deficits need to be balanced with the increased importance of homeland security (and related public safety), which, in turn, must be reconciled with the political costs of federal intervention, regulation and taxation; strong advocacy for preservation of state and local rights; and the inherently local nature of 9-1-1 services and delivery.

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<sup>5</sup> Current FCC requirements stipulate the ability to locate a wireless 9-1-1 caller within a specified distance. An interim requirement stipulates the ability to locate callers within the nearest cell site location; this requirement is known as "Phase I". "Phase II" requirements call for more precision: for network-based solutions, callers must be located within the nearest 100 meters for 67% of calls and 300 meters, for 95% of calls; for handset-based solutions, callers must be located within the nearest 50 meters for 67% of calls, and 150 meters for 95% of calls.

<sup>6</sup> Monitor Group E9-1-1 Public Views Survey, April 2003 (section 11) conducted to provide public opinion data to inform constituents and policymakers and in conjunction with the NENA Report Card to the Nation survey.

<sup>7</sup> NSTAC Convergence Task Force, June 2001.

<sup>8</sup> The SSPs are the those local exchange carriers (LECs) who are specifically charged with providing the database services (ANI) and final trunking of 9-1-1 calls to PSAPs from the selective router. Other LECs may trunk 9-1-1 calls to SSPs, but are not themselves 9-1-1 system service providers.

## *Framework for Analysis: Ideal Public Policy Objectives and Real-World Constraints*

The findings and recommendations of the E9-1-1 Stakeholders' Initiative have been guided by a set of six *ideal policy objectives*, as defined below:

- *Ubiquity*: E9-1-1 should ideally be available via wireline and wireless communications, anytime, anywhere, using any device.
- *Efficient use of scarce resources*: The financial and human resources maintaining and operating the E9-1-1 system are limited and would ideally be leveraged to provide the highest value at the lowest cost, both within the PSAP and by the WSPs and the SSPs.
- *Fairness*: Market incentives and enforcement mechanisms would ideally be balanced and aligned in a manner considered fair by all parties.
- *Timely deployment*: E9-1-1 deployment should be accelerated to ensure that this life saving technology becomes broadly available as quickly as possible.
- *Future proofing*: Investments made today in deploying E9-1-1 technology should ideally be fully cognizant of, and at a minimum, not preclude potential future technologies.
- *Service quality*: Service quality should not be compromised in the name of meeting other ideal public policy goals.

Each of these ideal public policy objectives needs to be balanced and traded-off against three key *constraints* which circumscribe the degrees of freedom and action implications for achieving these goals in a real-world environment. These constraints reflect the three fundamental issues described earlier and include the following: (a) the need for a coordinated set of incentives (consisting of *both* carrots and sticks) across *all* system participants, (b) the need to manage and respect the diversity and complexity of the PSAP environment, and (c) the need to work within the confines of political and economic reality.

### *Brief Discussion of Ideal Public Policy Objectives*

The discussion below sheds light on a few of the inherent tradeoffs that need to be made in attempting to meet the ideal policy objectives. This is not intended to be comprehensive, but rather to give a flavor for the nature of the E9-1-1 policy challenge.

*Ubiquity* and *timely deployment* address a chief focus of public safety, industry E9-1-1 players and the FCC, given that less than 20% of PSAPs will be Phase II capable by year-end 2003 with less than 70% deployment projected by 2007<sup>9</sup>. The general public shares a concern for ubiquitous, timely deployment as evidenced by recent Monitor public opinion data<sup>10</sup>.

While these two principles are of paramount importance, they must also be balanced with the practical considerations of the other public policy objectives (i.e., *efficient use of resources*, *service quality*, *fairness*, *future proofing*) and the three key constraints.

*Efficient use of resources*, for example, has become increasingly salient over the past 18 months. The complex and expensive task of E9-1-1 implementation requires a significant financial and human investment by all players. The downturn in the nation's economy and tight budgets are increasingly stretching the already thin resources of many PSAPs that in some cases struggle to accommodate basic staffing and technology needs. Efficient use of resources is also critical to WSPs and SSPs as they balance several issues including: Widely diverse and enormous numbers of PSAP deployments that resist repeatability across communities or regions; limited industry manpower; mounting financial pressure on the telecommunications industry. Policy makers must recognize these issues and craft appropriate solutions that are cost and resource effective. Efficient use of resources also means that any policy solution must avoid unintended consequences that result in inefficient use of labor or capital dollars

<sup>9</sup> Section 5, PSAP Deployment Timeline, provides additional information.

<sup>10</sup> Section 11, E9-1-1 Public Views Research Methodology and Summary Highlights, provides additional information.

(e.g., investment in Phase II equipment for PSAPs may require a corresponding investment in operator training to use the Phase II equipment and interpret the associated data). The principle of *service quality* comes into play here as well, as decisions about use of resources must also be guided by the need for maintaining minimum standards such as the ring-to-answer call handling time, minimum number of transfers to get a 9-1-1 call to the appropriate PSAP and other operating standards.

*Fairness* can be described as creating policy recommendations for any particular group that are not considered to be overly burdensome relative to the demands placed on other players. An example would be to balance the need for service ubiquity with appropriate cost distribution and regulatory oversight. A starting premise for “fairness” is that the benefits of the 9-1-1 system should be accessible to all. If, for instance, as analysis suggests<sup>11</sup>, 9-1-1 is largely considered a “public good”, “fairness” would dictate that the benefits of the 9-1-1 system be accessible to all and that the financial obligation among various participants be equitably disbursed. One implication of this statement might be that cross-subsidization of portions of the 9-1-1 system between states might be necessary (i.e., more populous states paying for services in more rural states). Another example of how the fairness might come into play is the current FCC model of driving E9-1-1 deployment largely through a single point of influence on one stakeholder group (i.e., WSPs). Many participants involved in the delivery of 9-1-1 services would suggest that this model is neither fair nor particularly effective, given the fact that multiple parties are responsible for the E9-1-1 system. These gaps are illustrative of the tension that policy makers face in addressing the “fairness” public policy objective.

*Future proofing* extends the notion of efficient use of resources to encouraging policy makers to avoid creating a set of obligations and investments that will be obsolete, isolated, or otherwise wasted within an unreasonably short period of time.

Decisions on the trade-offs of these objectives are guided by considerations of the *minimum conditions* identified earlier. For example, the aspiration for ubiquity and timely deployment may be helped by increased central coordination, or mandates on states or localities. However, these potential solution elements may not be politically viable, due to constraints around state and local decision rights. A viable solution may need to blend the fundamental principles of public safety (e.g., ubiquity and timely deployment) with more pragmatic notions (e.g., preserving state and local rights).

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<sup>11</sup> See section 11, Monitor Group E9-1-1 Public Views Survey, April 2003. Over 60% of 9-1-1 calls originate with someone not directly involved with the emergency.

## 4 Wireless E9-1-1 Funding and Cost Recovery

### 4.1 Overview

Pending legislation in Congress which would authorize substantial sums<sup>12</sup> in federal E9-1-1 matching grants underscores the need to understand the E9-1-1 funding and cost picture in detail. E9-1-1 funding and cost recovery is highly complex, requiring analysis of total available funding vs. total system costs, current cost recovery mechanisms, potential efficiencies to be captured, and consideration of alternate sources and uses of funding. As a starting point, according to a joint Monitor Group and NENA SWAT analysis, the 9-1-1 system in general appears to be under-funded relative to total system costs. Monitor Group estimates that **approximately \$2.3 billion is currently collected annually from dedicated funding sources**<sup>13</sup>. The ~\$2.3 billion figure is made up largely from surcharges collected on wireless and wireline customers' bills, in roughly equal amounts, with \$45 million of the total coming from state level 9-1-1 appropriations and taxes. **The estimated annualized system costs related to 9-1-1 and wireline and wireless E9-1-1, both Phase I and Phase II, is \$6.1+billion**<sup>14</sup>. This includes PSAPs' network operational expenses, capital upgrades and staffing; and WSP E9-1-1 related capital and operational costs<sup>15</sup>, but excluding non-wireless E9-1-1 wireline network maintenance costs. **Thus, at a 9-1-1 system level, there is a funding gap of \$3.8+ billion.** While a substantial portion of non-wireless specific E9-1-1 system costs (e.g., staffing) are borne by county / local government appropriations not included as a part of the \$2.3 billion figure, these funds are unlikely to make up the difference.

Focusing solely on the wireless E9-1-1 part of this picture, of this \$2.3 billion in total annual funds collected, Monitor Group estimates that **\$555 million** annually is currently statutorily targeted to wireless E9-1-1 purposes, with an estimated total **\$865 million actually allocated in 2003**<sup>16</sup>. Matched against these funds are annualized wireless **E9-1-1 specific costs of \$1.7 billion over the next 5 years**<sup>17</sup>. The net result is a **substantial gap of at least \$810 million annually.**

Notwithstanding the gap in annualized funding, the question arises as to where monies collected in previous years have gone, particularly given the fact that wireless E9-1-1 ubiquity is still considerably far off. What is clear is that there have been substantial wireless E9-1-1 related expenditures to date by all parties: SSPs, WSPs and PSAPs. Monitor Group estimates this to be roughly \$1 billion in non-recurring capital expenditures and up to \$440 million per year in ongoing operating expenses, as of the August 2003 FCC quarterly carrier filings. What is unclear is whether the net of funds collected in previous years would have been sufficient to cover these expenditures made to date, or whether more states should in theory still hold significant standing balances in E9-1-1 targeted funds.

There has been no systematic reconciling, on a nationwide basis, for how specifically any funds have been applied or to whom reimbursement has already been granted for costs incurred to date, or what standing balances exist — in which states and in what amounts. *Therefore, a much clearer reconciliation of funding sources and uses would be helpful, as would be a mechanism for ongoing accountability of specific uses for any additional funds injected into the system. Such a process could also clarify ways to seek efficiencies in the way the funds are being used or*

<sup>12</sup> See Senate bill, S.1250, "The Enhanced 911 Emergency Act of 2003" (pending) which specifies \$500MM per year over 5 years, and House bill H.R.2898, "The E-911 Implementation Act of 2003" (passed November 4, 2003), which specifies \$100MM per year over 5 years.

<sup>13</sup> In addition to these sources, there are also funds applied through county and local government appropriations which remain difficult to estimate.

<sup>14</sup> Of the \$6.1+ billion in total 9-1-1 system costs, \$4.4+billion are non wireless E9-1-1 specific costs, such as PSAP staffing, and 9-1-1 related wireline operational expenses.

<sup>15</sup> SSP and other LEC related costs are accounted for in the costs that PSAPs and / or WSPs incur and pay to SSPs / LECs for their services.

<sup>16</sup> This \$555 million figure is derived from an analysis of statutory requirements on the use of the \$1+ billion collected through wireless surcharges. The balance of these funds beyond the \$555 million may be applied according to local discretion and state statutes, to any of the \$6.1+ billion in general 9-1-1 related system costs. Based on interviews with State Coordinators and governments, Monitor Group estimates roughly \$310 million of this balance, in addition to the \$555 million statutory minimum, has been allocated to wireless E9-1-1 specific costs in 2003, resulting in a total 2003 estimated allocation of \$865 million.

<sup>17</sup> The annualized \$1.7 billion is comprised of (i) approximately \$0.3 billion per year for PSAP wireless E9-1-1 capital upgrades and operating expenditures, excluding staffing, (ii) an annualized \$1.0 billion for WSPs for E9-1-1 related costs, of which \$307 million per year goes toward SSPs in trunking and other recurring network costs (iii) adequate provision for upgrading counties with no wireline E9-1-1 capability to Phase I and II wireless E9-1-1. This figure explicitly excludes an estimated total of \$150 million in PSAP related wireless E9-1-1 capital already deployed.

*could help to re-define priorities.* In that same spirit, Monitor Group and the NENA SWAT technical team undertook an analysis of such potential efficiencies, by examining consolidation of PSAPs as a potential way to close the funding gap by cutting costs, by examining concerns around wireline tariffs, and by examining other potential infrastructure-related efficiencies. Those analyses can be found below in Section 3.5.

As further evidence of the need for increased accountability, there have been several reports of states, under budget duress, diverting standing or incoming E9-1-1 balances to other spending priorities, accounting for at least \$400 million in total<sup>18</sup>. However, diversion of funds should not be taken as an indicator of funding sufficiency: States with funding shortfalls often accrue balances as they attempt to build enough funds across years to make necessary expenditures; these balances have become targets by some states struggling with budget shortfalls. With budgetary pressures on states increasing in the current political and economic environment, the likelihood of fund diversion increases. Similarly increasing pressures will exist for reducing discretionary allocation of funds to wireless E9-1-1 back to the statutory minimums. All of this serves only to increase the overall total funding pressure on the 9-1-1 system, exacerbating the overall funding gap and making ubiquitous wireless E9-1-1 deployment all the more challenging.

The balance of this section provides a brief set of considerations for funding and cost recovery policy alternatives, an analysis of Phase II upgrade costs, an analysis of funding sources and uses, and an analysis of system cost efficiency alternatives explored.

## 4.2 Policy Considerations for Funding and Cost Recovery

Various options exist to close the E9-1-1 funding gap, including federal funding, state funding, hybrid state and federal funding, locally raised funds, national surcharge, and privatized funding options. Below we provide several observations which may be helpful considerations for policy makers as they evaluate alternatives:

- The overall total system level 9-1-1 funding pressure has a negative effect on *wireless E9-1-1* deployment, and vice versa; by increasing available funds for all parties deploying *wireless E9-1-1*, the total 9-1-1 system funding pressure is relieved
  - A net funding infusion targeted to wireless E9-1-1 could, in many cases, lessen the tendency of sequential payment, whereby expenditures of a single party, typically WSPs, might be de-prioritized, despite state statutes or a state's best intentions
  - A key aspect of the funding challenge is that no single institution currently exists that can effectively provide the amount of incremental funding required by the 9-1-1 system, and have the authority and responsibility to mandate an appropriate accounting of the sources and uses of funds.
- Despite potentially valid reasons to resist a federal role in funding E9-1-1, there also exist compelling reasons for considering a federal role in funding:
  - E9-1-1 may be defined as a public good, in that its usage meets the non-rivalry and non-excludability tests, frequently used to define public goods, and it is used in many circumstances to report incidents that relate to the safety of the public as opposed to the caller<sup>19</sup>
  - E9-1-1 is also a key component in the overall Homeland Security fabric, with the federal government understandably taking a nation-wide approach to the increasingly important Homeland Security challenges
  - As noted earlier, the funding gap may be too large for states to close without federal help, or without imposition of unfunded state mandates, which would be resisted by states (see the next point)
- State and local representatives may have concerns regarding federal level policy decisions which impact funding and associated mandates

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<sup>18</sup> States experiencing diversion of funds in the last 3 years include AZ, CA, DC, ME, MD, NY, NC, OR, RI, SC, TX, VA, WA; source: online publications, interviews with public safety and state officials.

<sup>19</sup> One in ten callers to 9-1-1 report a public safety, as opposed to personal safety, incident; For wireless 9-1-1 calls this percentage increases to 14%; See section 12 for more details.

- Any option perceived by the state and local governments as an unfunded federal mandate would likely engender considerable resistance; e.g., state and local representatives would likely strongly resist an option which attempts to reinstate WSP cost recovery as a pre-condition to Phase II deployment
- Policy options which would posit a loss of control by the states on existing state wireless surcharges, would likely encounter significant resistance and be perceived as usurping states’ rights
- Funding and cost recovery options should also contemplate the impact on consumers and should minimize or avoid placing overly onerous burdens differentially on any single group of citizens e.g.,:
  - The introduction of another layer of surcharges on consumers’ bills, albeit for public safety, may be confusing and annoying to consumers
  - Consumers using smaller and rural carriers could be disproportionately burdened with some cost recovery mechanisms given the smaller total customer base over which costs can be recovered
  - Consumers in states which have already funded wireless E9-1-1 for PSAPs and service providers for their state would be burdened by paying additional surcharges or taxes to fund E9-1-1 in other states

### 4.3 Phase II Upgrade Costs

Below, we provide a discussion of the overall cost methodology, analysis of the costs required to upgrade to Phase II (i.e., “Delta” costs), and elements of the costs that are specific or unique to 9-1-1 only.

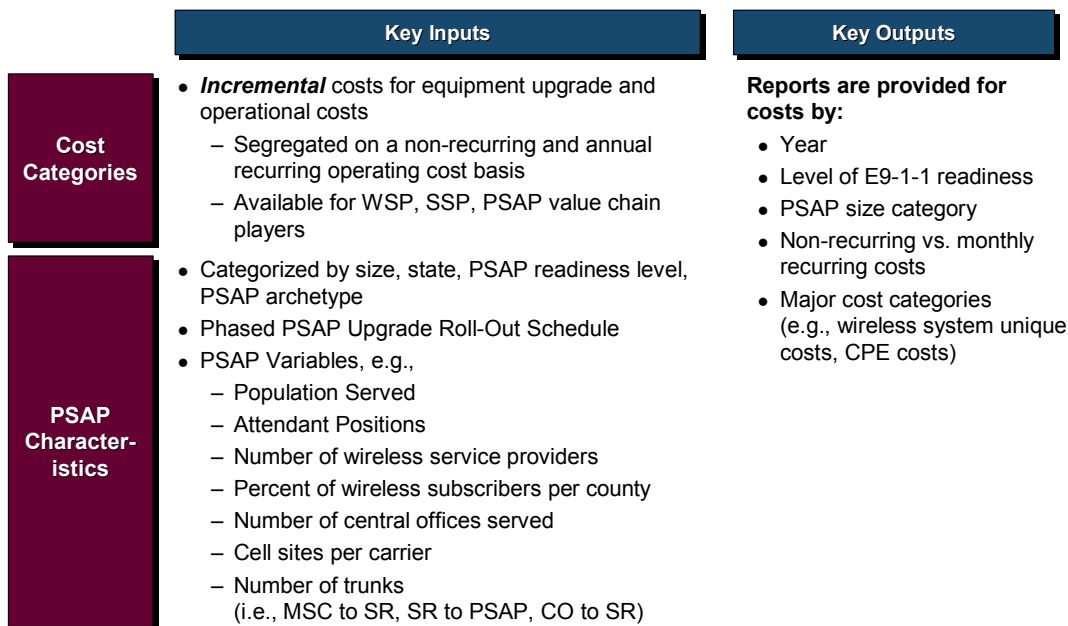
#### 4.3.1 E9-1-1 System Cost Methodology

NENA SWAT’s Technical Team developed the initial cost model and all of its inputs. The model determines the incremental costs for implementing Wireless E9-1-1 with Phase II nationally. Costs are broken out by non-recurring and monthly recurring, by PSAP size category, and by E9-1-1 Readiness level.

#### Cost Model

##### Overview

*The cost model calculates yearly upgrade costs for all PSAPs to become Phase II compliant. Costs outlined in this presentation do not include personnel costs in the annual recurring operating cost calculation*



## Model Cost Categories

Each cost line item is associated with one or multiple upgrade phases:

- Greenfield to Phase I
- E9-1-1 to Phase I
- Phase I to Phase II

For each line item a non-recurring and a monthly recurring cost per unit is listed. The cost items also have an associated number of units per PSAP, one for each size category. The size category groupings are based on the PSAP population with the following breakouts:

- Category 1: Less than 19K
- Category 2: 19K–100K
- Category 3: 100K–140K
- Category 4: 140K–250K
- Category 5: 250K–600K
- Category 6: 600K+

## Summary Projected Costs Individual PSAP Overview

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Number of PSAPs within Each Upgrade Path

	Greenfield / Basic to Phase II *	E9-1-1 to Phase II	Phase I to Phase II	Phase II
Category 1	275	1,488	1,053	418
Category 2	50	1,224	1,081	527
Category 3	8	117	76	50
Category 4	0	79	67	74
Category 5	0	37	40	42
Category 6	0	20	11	10
<b>Total</b>	333	2,965	2,328	1,121

The per PSAP cost for each line item is calculated by multiplying the cost per unit times the number of units for each size category. Using data from the updated Intrado PSAP Registry<sup>20</sup>, the number of PSAPs per size category per E9-1-1 readiness level was determined.

The product of number of PSAPs per size category per E9-1-1 readiness level and the per PSAP cost data allows for the determination of the total costs per size category for implementing Wireless E9-1-1 with Phase II nationally.

<sup>20</sup> See Section 5 for methodology in updating the Intrado PSAP Registry.

The cost by state is determined by using an allocation methodology. Using data from the PSAP registry, the number of PSAPs per state per E9-1-1 readiness level per size category was determined. From this data, a % per state per size category was calculated. The product of this percent and the cost per size category results in the cost per state per size category.

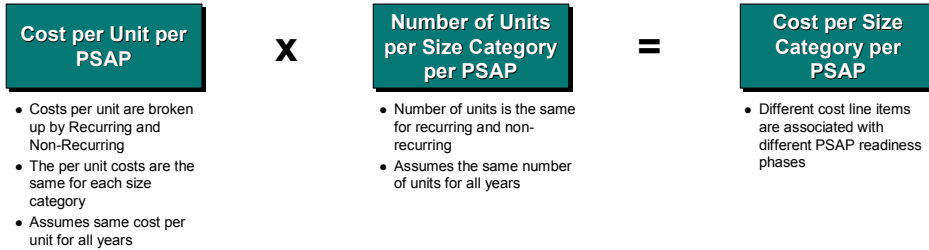
The costs can then be analyzed by a series of views including:

- E9-1-1 readiness level
- Cost category
- Size category
- Value chain player

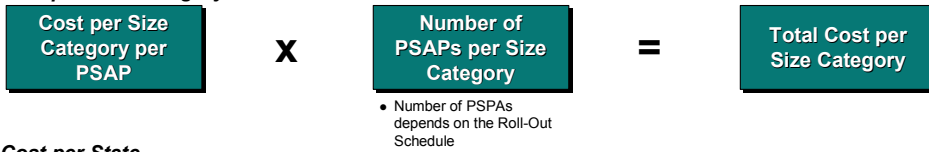
## Methodology

### Methodology to calculate the 5 Year Costs

#### Cost per Size Category per PSAP



#### Cost per Size Category



#### Cost per State



Sources: State 9-1-1 coordinators, state budget offices, public record. County funding based on estimated average surcharge per state

## Breakdown of Sources of Costs

The NENA SWAT Technical team provided the data input to the cost model. Other inputs to the overall cost analysis came from various other sources including NENA, State Statutes, APCO, various State Agencies, FCC, etc. Monitor Group attempted to provide high-level secondary validation of key cost drivers through the constituent interview process.



## Data Sources and Assumptions

Input data and assumptions come from various sources including NENA and Monitor

Data Type	Data	Source
<b>Cost</b>	<ul style="list-style-type: none"> <li>5-year Recurring Operating Cost by Cost Item by PSAP Size Category</li> <li>5-Year One-Time Upgrade Cost by Cost Item by PSAP Size Category</li> </ul>	<ul style="list-style-type: none"> <li>NENA SWAT Technical Team Cost Model</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>5-year State Funding</li> <li>5-year County Funding</li> </ul>	<ul style="list-style-type: none"> <li>State Statutes and other public records</li> <li>NENA</li> <li>APCO</li> <li>State agencies (9-1-1 offices, budget offices)</li> </ul>
<b>Number of Subscribers</b>	<ul style="list-style-type: none"> <li>Number of Wireline Subscribers 2003–2007</li> <li>Number of Wireless Subscribers 2003–2007</li> </ul>	<ul style="list-style-type: none"> <li>FCC</li> </ul>
<b>PSAP Characteristics</b>	<ul style="list-style-type: none"> <li>E9-1-1 Readiness Level</li> <li>PSAP Size Category</li> <li>State</li> </ul>	<ul style="list-style-type: none"> <li>NENA DOT Project</li> <li>Monitor Analysis</li> </ul>
<b>PSAP Upgrade Schedule</b>	<ul style="list-style-type: none"> <li>Percent of PSAPs within each E 9-1-1 Readiness Level that upgrade each year</li> </ul>	<ul style="list-style-type: none"> <li>NENA SWAT Technical Team Analysis</li> </ul>
<b>Number of PSAPs</b>	<ul style="list-style-type: none"> <li>Total Number of PSAPs per size category</li> </ul>	<ul style="list-style-type: none"> <li>FCC quarterly findings; Intrado Registry</li> </ul>

## Costs Items Included within the National Cost Estimate

The list below shows the cost items contained in the NENA SWAT Technical Team model. These cost items are put forth as a plausible starting point for determining what constitutes “appropriate” for federal grants.

## Cost Model

### Costs by Cost Categories

Cost Category	Cost Line Item	Cost Category	Cost Line Item	
<b>Wireline Transport and Connectivity Costs</b>	End Office to Sel Rtr trunk	<b>LEC Data Systems and Data Costs</b>	Upgrade existing regional ALI pair to E2	
	EO to Sel Rtr trunk mileage		DBMS ALI record processing and maintenance	
	Sel Rtr to PSAP trunk		Wireless Carrier Admin Greenfield to Phase I	
	Sel Rtr to PSAP trunk mileage - in-band signaling — wireless		Wireless Carrier Admin E911 to Phase I	
	ALI to PSAP data circuits		Ph 2 Network Based Costs	
<b>Wireless Voice Transport and Connectivity Costs</b>	MSC to SR — trunk	<b>Wireless System Unique Costs</b>	ESME Port & license for Dynamic ALI link (ESME to MPC/SCP)	
	MSC to SR connectivity trunk mileage		ALI Transport on Dynamic ALI link (ESME to MPC/SCP)	
	Sel Rtr to PSAP trunk — in-band signaling (MF) — wireless		PDE transport — E12 link (PDE to MSC)	
	Sel Rtr to PSAP trunk mileage — in-band signaling — wireless		PDE transport — E5 link (PDE to MPC/SCP)	
			Phase II handset based costs	
<b>Wireline Serving Switch Costs</b>	EO outbound trunk port		Phase II handset PDE equipment	
	MSC 9-1-1 Generic Software load		<b>PSAP Implementation Costs</b>	Addressing
	MSC setup for 9-1-1 in-band (MF) connectivity			PSAP mapping
	MSC setup for 9-1-1 out-of-band (SS7) connectivity			GIS software
	MSC Preparations / Translations			PSAP training
Third Party Provider Fees	Additional costs not covered above			
<b>CPE Costs</b>	New PSAP CPE, small	<b>9-1-1 Service System Provider Costs</b>	Consulting and Project Management	
	New PSAP CPE, medium		Public education (first year)	
	New PSAP CPE, large		EO outbound trunk port	
	Upgrade CPE to Phase II capable		MSC 9-1-1 Generic Software load	
Mapping System and consoles	MSC setup for 9-1-1 in-band (MF) connectivity			
<b>Selective Router Costs</b>	Wireless Phase I upgrade for existing Selective Rtr.	MSC setup for 9-1-1 out-of-band (SS7) connectivity		
	Selective Router inbound 9-1-1 trunk port	MSC Preparations/Translations		
	Selective Router outbound 9-1-1 trunk port	Vendor Support (exclude training)		
	Selective Routing Service (price/1,000 TN)	Training (include vendor's training)		
	ANI Service (LEC price/1,000 TN)	<b>Phase II Accuracy Certification</b>	Certification	

## Cost Outputs

The cost model links non-recurring costs and annual recurring operating costs calculated by each type of PSAP (as denoted by E9-1-1 readiness status and the PSAP size) across all costs for WSPs, SSPs and PSAPs.

### Total PSAP, WSP, SSP Costs per PSAP Category: Non-Recurring Costs / Annual Recurring Operating Costs (in 000s)

Primary PSAPs					Secondary PSAPs				
	Basic to Phase II	E9-1-1 to Phase II	Phase I to Phase II	Phase II		Basic to Phase II	E9-1-1 to Phase II	Phase I to Phase II	Phase II
Category 1	\$529	\$202	\$193	\$148	Category 1	\$423	\$121	\$111	\$68
	\$143	\$71	\$71	\$71		\$70	\$22	\$22	\$22
Category 2	\$1,244	\$632	\$631	\$542	Category 2	\$974	\$449	\$438	\$362
	\$314	\$168	\$168	\$168		\$154	\$78	\$78	\$78
Category 3	\$2,235	\$1,130	\$1,118	\$1,969	Category 3	\$1,586	\$694	\$682	\$535
	\$583	\$338	\$338	\$338		\$264	\$154	\$154	\$154
Category 4		\$1,746	\$1,731	\$1,533	Category 4		\$986	\$970	\$774
		\$576	\$576	\$576			\$257	\$257	\$257
Category 5		\$3,053	\$3,031	\$2,627	Category 5		\$1,474		
		\$1,127	\$1,127	\$1,127			\$502		
Category 6		\$6,848	\$6,808	\$5,805	Category 6		\$2,437	\$2,398	\$1,396
		\$2,882	\$2,882	\$2,882			\$1,258	\$1,258	\$1,258

Total non-recurring costs for deploying Phase II is \$3.62 billion, and total annual recurring operating cost is \$1.14 billion (once all PSAPs have been upgraded to Phase II).

## Summary Projected Costs

### E9-1-1 System Overview

*Non-recurring cost for deploying Phase II is \$3.62 billion and annual recurring operating cost is \$1.14 billion*

Non-Recurring and Annual Recurring Operating Costs for All PSAPs (\$ Million)

PSAP Category	Cost Type	Greenfield / Basic to Phase II	E9-1-1 to Phase II	Phase I to Phase II	Phase II	Total
Category 1	Non-Recurring	\$145	\$281	\$196	\$55	\$709
	Annual Recurring Operating	\$39	\$93	\$70	\$26	\$228
Category 2	Non-Recurring	\$62	\$756	\$664	\$279	\$1,820
	Annual Recurring Operating	\$15	\$197	\$178	\$85	\$475
Category 3	Non-Recurring	\$17	\$126	\$82	\$48	\$282
	Annual Recurring Operating	\$4	\$37	\$24	\$17	\$82
Category 4	Non-Recurring	\$0	\$127	\$112	\$110	\$366
	Annual Recurring Operating	\$0	\$41	\$37	\$41	\$119
Category 5	Non-Recurring	\$0	\$102	\$121	\$110	\$352
	Annual Recurring Operating	\$0	\$37	\$45	\$47	\$130
Category 6	Non-Recurring	\$0	\$119	\$53	\$54	\$237
	Annual Recurring Operating	\$0	\$51	\$24	\$27	\$102
Total	Non-Recurring	\$224	\$1,511	\$1,228	\$656	\$3,618
	Annual Recurring Operating	\$59	\$456	\$378	\$243	\$1,136

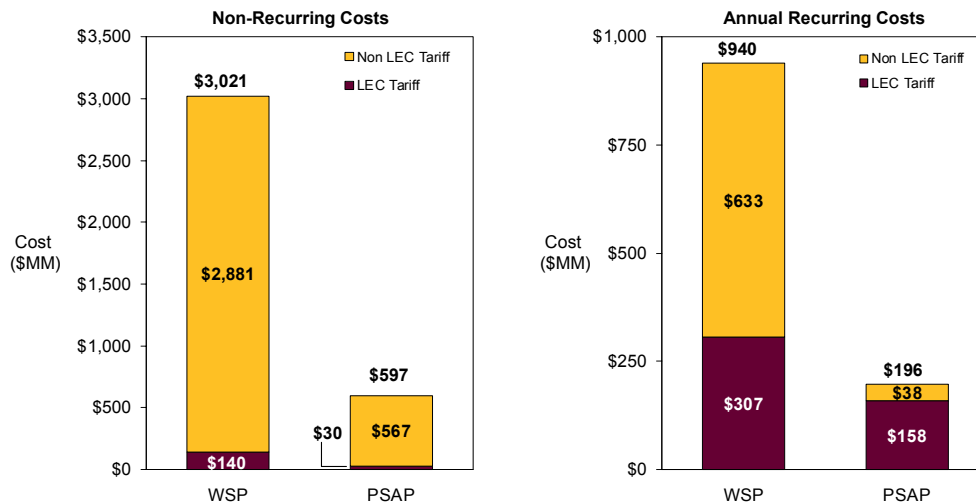
While non-recurring costs are higher for network-based WSPs than handset-based, recurring costs are roughly equivalent.

### 4.3.2 Phase II Delta Cost Analysis

A significant portion of the total estimated costs to reach wireless Phase II ubiquity stem from upgrading the PSAPs themselves for Phase II related incremental capital (non-recurring) costs, including the costs of creating enhanced wireline functionality in Greenfield counties. CPE and mapping are the most important drivers of PSAP non-recurring costs. Another \$825 million in incremental operating expenses will be incurred by PSAPs over 5 years.

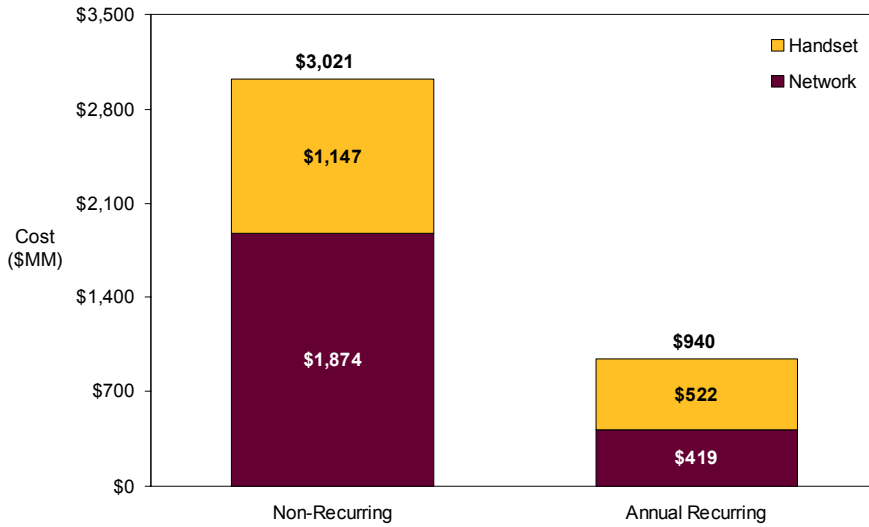
The bulk of the one-time capital costs stem from upgrading WSPs to provide Phase II location data. Approximately \$3.02 billion of the total costs are attributable to one-time WSP upgrades such as Position Determination Equipment (PDE) for network-based players and the incremental cost of GPS chipsets for handset-based players. However, ongoing operating expenses of \$940 million per year overshadow these capital costs in the long run. Of the \$940 million in incremental WSP operating costs, approximately 33% are attributable to SSP tariffs for trunking from Mobile Switching Centers to Selective Routers, and other transport and database related charges. The balance of WSP operating expenses stem from equipment maintenance for network-based players and ongoing handset replacement for handset-based players.

#### Summary Projected Costs Cost by WSP and PSAP



Of total WSP costs, network-based players bear a larger proportion of non-recurring costs, while recurring costs are distributed approximately evenly.

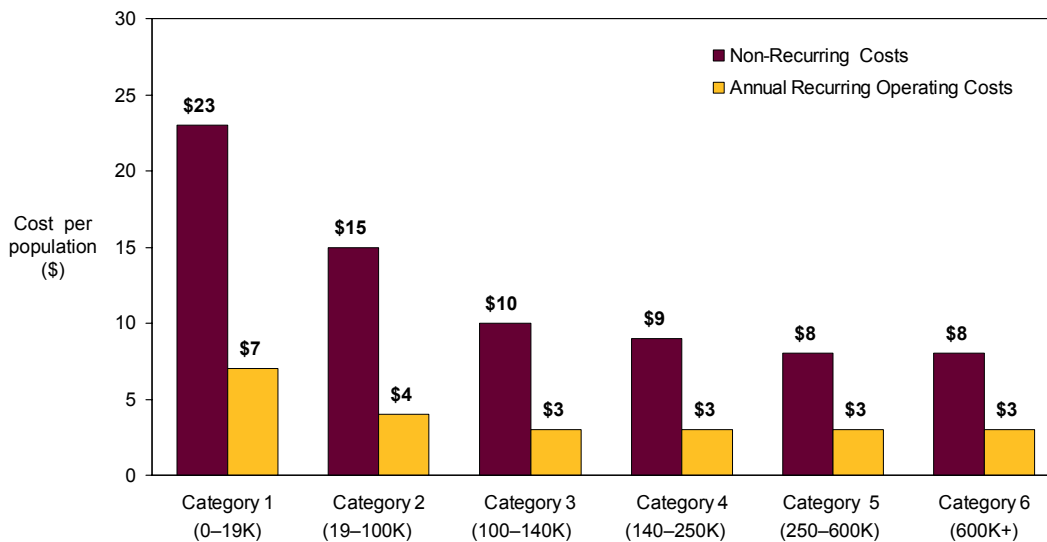
## Summary Projected Costs WSP Costs by Technology



Economies of scale are apparent with PSAPs that serve larger populations, as they have lower upgrade and annual operating costs on a per population basis.

## Summary Projected Costs Cost per Population by PSAP Size Category

*Economies of scale is apparent with PSAPs that serve larger populations having lower upgrade and annual operating costs per population*

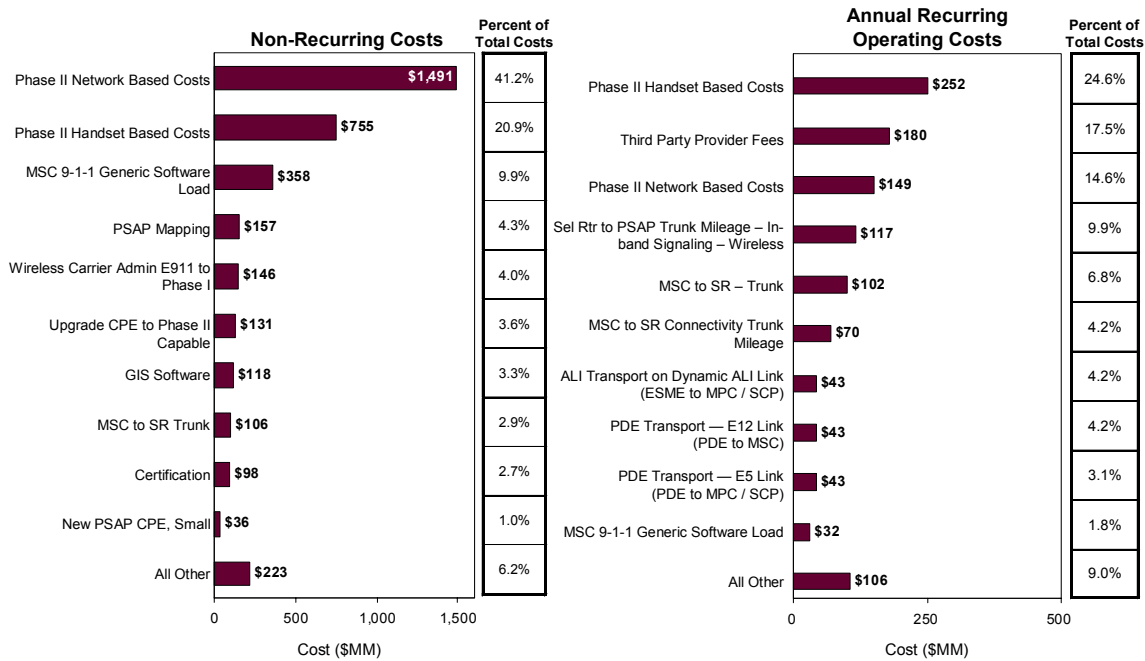


The top ten non-recurring and recurring costs are listed below:

### Key Areas of Sensitivity

#### Top 10 Non-Recurring and Annual Operating Costs

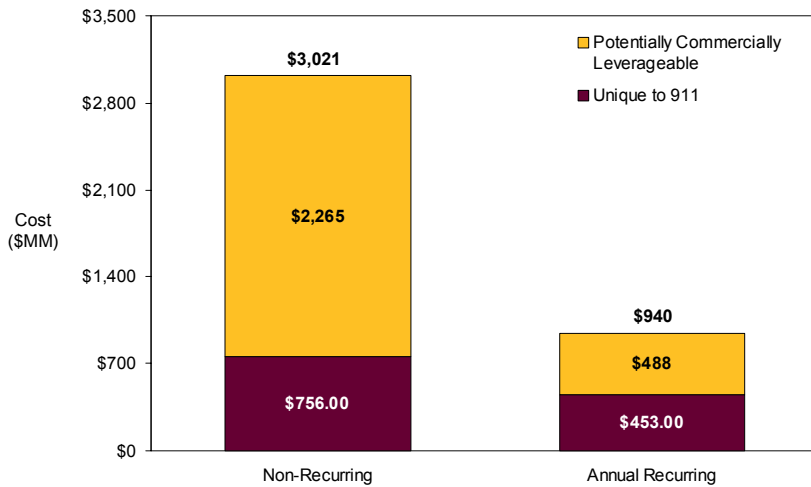
The top 10 costs in the model are listed below.



#### 9-1-1 Unique Costs

Within the total delta cost discussion, some in public safety and state/local government have raised the question of whether the majority of one-time capital costs incurred by wireless carriers for E9-1-1 might be leverageable for commercial Location Based Services, and should therefore be incurred largely or entirely by WSPs (thus potentially reducing the delta to be considered as part of the wireless E9-1-1 funding issue). This analysis considers the portion of Phase II costs that may be associated with LBS functionality, how well these investments match LBS needs and the potential revenue stream of LBS that may be used to support these investments. The chart below illustrates the basis for the belief that some portion of Phase II upgrades might support commercially-leverageable functions:

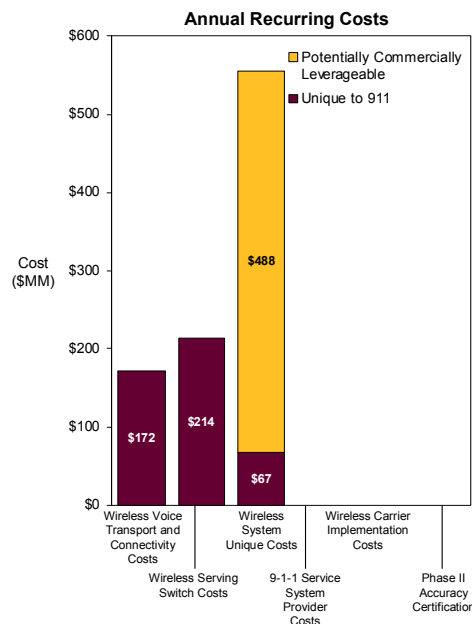
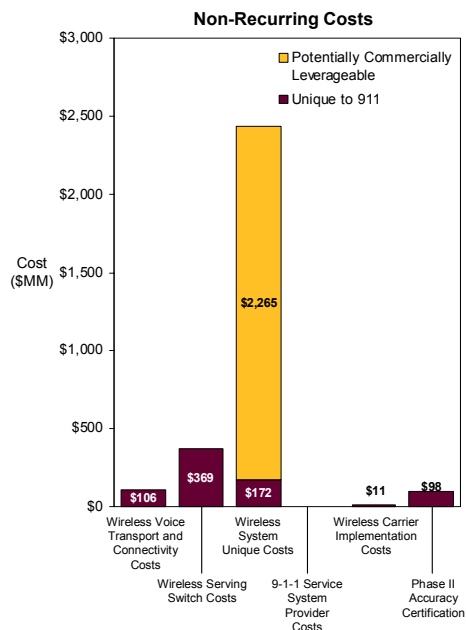
## WSP Cost Recovery



Over 90% of the Wireless System Unique Costs (i.e., the position determining infrastructure) may be seen as supporting LBS under a broad definition. However, it is important to note that WSPs would likely refute this claim, arguing that much of the investment associated with Phase II E9-1-1 is actually unnecessary to LBS' operation. While it may be important for 9-1-1 to pinpoint a cell phone to Phase II specifications, most LBS applications require a level of precision much closer to Phase I specifications. WSPs believe that most of the costs they are required to incur on the basis of 9-1-1 upgrades are not, in fact, commercially leverageable. Moreover market analysts' forecasts suggest that the commercial revenue potential of LBS has declined significantly. In-Stat's October 2002 forecast projects a 2006 worldwide market of only \$167MM. This level of revenue would clearly not support the capital investment required to deploy location based technology for WE9-1-1.

## Summary Projected Costs

### Unique 9-1-1 Costs



## 4.4 Funding Sources and Uses Methodology and Analysis

In order to fully understand the scope of any funding gaps that exist, Monitor Group conducted an analysis of the current E9-1-1 funding situation. Using states as the primary unit of analysis, this effort aimed to identify existing funds currently available to pay for the costs outlined in the previous section.

### *Funding Sources and Uses Methodology*

Monitor Group's funding analysis focused on identifying the total funds in each state and determining what portion of those funds are available for wireless E9-1-1 upgrades and resulting recurring costs. State fund data (surcharges, appropriations) was gathered from interviews with state 9-1-1 coordination offices (in states where they exist), state budget / finance departments, or estimated based on existing NENA data / assumptions and secondary research. County fund data was gathered using state coordinator interviews, state records of the average county wireline and / or wireless surcharges levied in the state, multiplied by the corresponding number of access lines. For states where data regarding specific county surcharges was available, each county's surcharge(s) was multiplied by the corresponding number of access lines serving that county.

Having identified funds collected at state and county levels, the analysis turned to the allocation of each category of funds to wireless E9-1-1 non-recurring / recurring costs (e.g., PSAP CPE upgrades, MSC to SR trunking charges, Phase I and II WSP costs) versus all other costs (e.g., wireline network maintenance, administration, PSAP staffing, other costs). The information has been compiled through 26 state coordination office interviews. For the remaining states with specific legislation on fund usage, the funding allocation has been determined from a mix of state statute surveys, Monitor Group assumptions on wireline / wireless access lines, and specific state allocation methodologies to wireless E9-1-1 upgrades (Examples include specific allocation to some portion of Phase I and II costs, WSP cost recovery, or to a designated PSAP fund specifically used for wireless E9-1-1 related upgrade costs). For remaining states with no specific legislation on fund usage, a set of general assumptions on fund usage was applied,<sup>21</sup> keeping in mind that some of these states have utilized their wireline funds to ease the burden of upgrading to Phase I / II technologies for the more motivated PSAPs. The resulting funds that are allocated for wireless E9-1-1 specific costs were then further broken down by the following: a) the minimum amount that is mandated by states for wireless E9-1-1 costs, and b) additional funds used for wireless E9-1-1, but not mandated.

A case example illustrates the methodology described. In Arkansas, the state collects approximately \$6.8 million annually from a state-wide wireless surcharge. These funds are allocated 58% to Phase I and II non-recurring / recurring costs<sup>22</sup>, 38% to PSAPs for use in defraying other costs (e.g., staffing, administration), and 4% for fund and wireless carrier administration purposes. The only condition placed on PSAPs to receive the 38% allocation of funds from the wireless surcharge is the capability to handle wireless calls over the 9-1-1 network. Review of wireless statutes indicates that the 58% allocation is the minimum required by statutes for use in defraying Wireless E9-1-1 costs. Wireline surcharges are controlled by counties and are used primarily for maintaining the wireline system and general PSAP operations.

### *Funding Sources and Uses Analysis*

The 9-1-1 systems across the country are funded by myriad sources, ranging from telecom surcharges to cigarette taxes.<sup>23</sup> While most of this system funding is used to maintain current 9-1-1 operations, paying for call-takers' salaries, call center facilities, etc., a portion is currently being used to support Phase I and Phase II upgrades. As one would expect given the diversity of mechanisms funding 9-1-1, current sources of funding for Phase I and Phase II upgrades vary across states and localities within states. While generalizations about funding are,

<sup>21</sup> A general assumption on 9-1-1 fund usage was made for any states with no WSP Phase I and II cost recovery specification in their statutes: Of all state and county 9-1-1 surcharges / appropriations, 17% were allocated to wireless E9-1-1 upgrades, 83% to staffing, other administration and wireline maintenance costs. Model was provided by NENA based upon their experience in a medium-sized state, further extrapolated for smaller states.

<sup>22</sup> For Phase II costs, Arkansas provides WSP cost recovery for PDE, but does not provide direct compensation to WSPs for handset chip costs.

<sup>23</sup> The cigarette tax is one of the funding sources being used in Steuben County, New York, to fund the building of its first 9-1-1 center.

therefore, somewhat difficult, some understanding of the current funding situation is needed to inform choices regarding the solution.

Four sources of funds were considered for inclusion in the analysis:

- State surcharges: Any surcharge appearing on a wireline or wireless phone bill that is levied and collected by the state
- State appropriations: Any amount requested and granted from the state treasury that is managed by a state 9-1-1 authority
- County surcharges: Any surcharge designated for E9-1-1 and / or wireless E9-1-1 appearing on a wireline or wireless phone bill that is levied and collected by a county or local jurisdiction
- County appropriations: Any amount requested and granted from a county or local budget that supports a PSAP

While all four sources of funds are recognized as significant components of the complete funding situation, county appropriations were generally excluded from Monitor Group’s analysis for two reasons. First, interviews with state coordinators and PSAP managers indicated that the vast majority of county appropriations are used to support on-going public safety and 9-1-1 operations, including PSAP personnel, first responder infrastructure and general maintenance. As such, county appropriations are not considered a significant source of those funds that are currently available for Phase II upgrades. (It is important to recognize, however, that these county appropriations are thought to make up the majority of funds used to maintain existing 9-1-1 services.) Second, with few exceptions, accurate county appropriations data was unavailable within the scope of Monitor Group’s analysis.

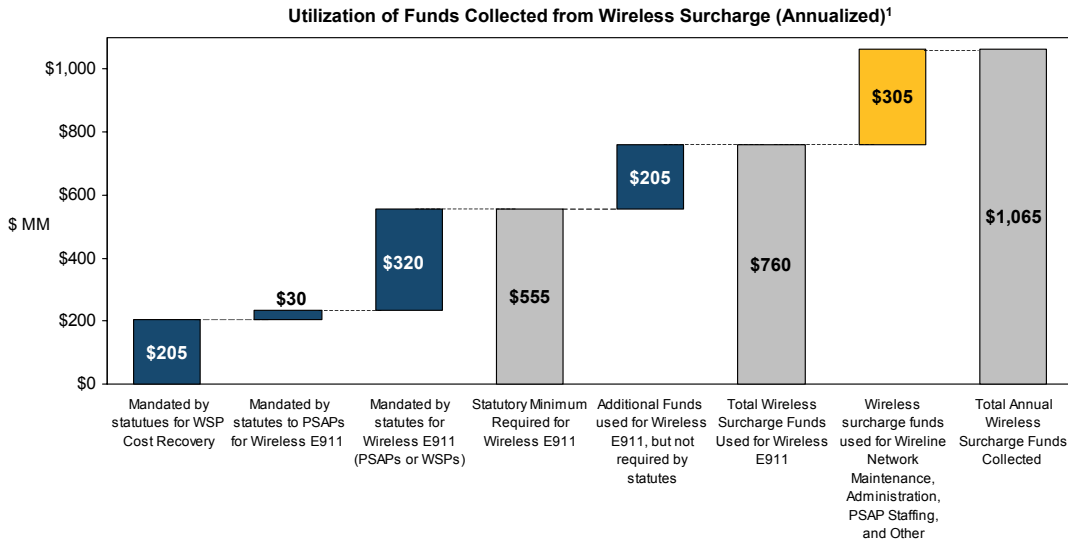
While the three sources of funds listed above provide the majority of funds available for Phase I and Phase II upgrades, not all of the funds collected are designated for these purposes. In many states and localities, a portion of the E9-1-1 and wireless E9-1-1 surcharge may be devoted to ongoing operations and / or to non-equipment costs (e.g., additional staff) associated with providing enhanced 9-1-1. An evaluation of governing legislation in each state, together with input from many state coordinators, suggests that approximately \$865 million of the ~\$2.3 billion collected annually from wireless and wireline surcharges is available for Phase I and Phase II. Out of this \$865 million, a minimum of \$555 million is mandated by statutes to be used for wireless E9-1-1 specific costs.

In total, ~\$1.065 billion are collected from wireless surcharges. Of this amount, a minimum of \$555 million are mandated by state statutes for Wireless E9-1-1 costs. Of the remaining \$510 million not statutorily mandated for wireless E9-1-1 specific costs, interviews suggest that up to 60% of this amount this year is being appropriated to non wireless E9-1-1 specific “general 9-1-1” costs (e.g., staffing, 9-1-1 wireline operating expenditures).



## Utilization of Funds Collected from Wireless Surcharges

Approximately \$1Bn in wireless surcharge funds are collected annually. Of this amount about half (~\$555M) is statutorily mandated to fund wireless E9-1-1 deployment

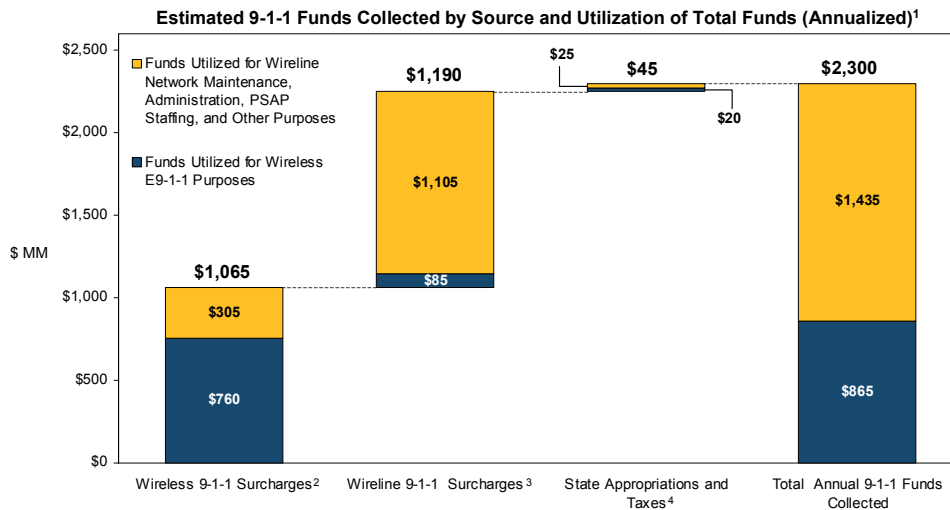


<sup>1</sup> Includes state and county / local funds  
Source: State Coordinator interviews, State statutes, Monitor Analysis

The approximate \$1 billion in wireless surcharge contributes to the \$2.3 billion collected annually from states and counties across wireless and wireline surcharges and appropriations. Across all these sources of funds, \$865 million are allocated to wireless E9-1-1 upgrade projects and \$1.4 billion are used for staffing, maintenance of the wireline network, and administrative purposes.

## Total 9-1-1 Funds Collected

Approximately \$2.3Bn in wireline surcharges, wireless surcharges, state appropriations and taxes is collected each year. In total, an estimated \$865MM is allocated to wireless E9-1-1 activities

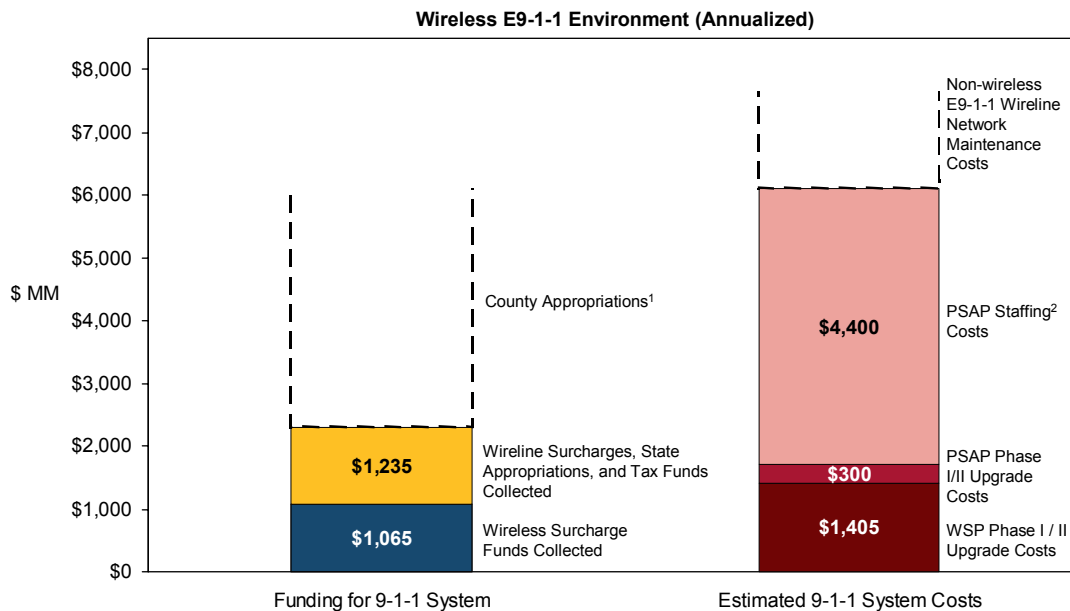


<sup>1</sup> Breakdown of funds according to information from state coordinators, where available. If not available, estimates of fund breakdowns used. <sup>2</sup> Includes State and County Surcharges, <sup>3</sup> Includes state and some portion of local surcharges, <sup>4</sup> County appropriations, which represent a significant portion of PSAP operational funds, are not represented here  
Note: Taxes refers to states that fund 9-1-1 through local taxes. States with state appropriations or taxes include Maine, Missouri, New Jersey, and Vermont  
Source: State Coordinator interviews, State statutes, Monitor Analysis

The 9-1-1 system appears to be severely under-funded relative to overall system costs. Although ~\$2.3 billion is collected annually for the entire 9-1-1 network, this revenue stream is dwarfed by an estimated \$6.1+ billion in annualized system costs (including all PSAP operating expenditures, staffing, all capital upgrades and WSP E9-1-1 costs). While a substantial portion of general 9-1-1 system costs (e.g., staffing) are borne by county / local governments through local budget appropriations, these funds are unlikely to make up the difference.

## Wireless E9-1-1 Environment and PSAP Environment — I High Level Summary

*Dedicated funding sources do not cover all expenses of 9-1-1 system, causing localities to make budgetary trade-offs, such as PSAP staffing vs. Phase I / II upgrades*



<sup>1</sup> County appropriations are difficult to estimate within the scope of this project, but generally makes up a significant portion of funding for PSAP operational expenses. For example, Washington state is known to have approximately \$120MM in county appropriations. <sup>2</sup>PSAP staffing costs reflect a high level estimate based on \$4,875 fully loaded operator costs per month and 4.7 personnel per 24/7 man positions. Assumption of positions is based on total positions within NENA technical team cost model.  
Source: State Coordinator interviews, State statutes, Monitor Analysis

**Funding Methodology Limitations:** As discussed at the beginning of this section, the funding methodology applied uses the state as the unit of analysis. While this choice was necessary to complete the analysis within time and resource constraints, it may result in a slightly “optimistic” view of the funds available for upgrade. When grouping all county surcharges and state disbursements to counties together, one makes the implicit assumption that all counties have equal access to those funds. In practice, however, counties have access only to a pre-determined share of the funds — most frequently based on population — resulting in some counties’ receiving funds in excess of their needs while other counties’ shares are insufficient to fully support their Phase I and Phase II costs.

## 4.5 System Cost Efficiencies Explored

As a means of effectively increasing the amount of funding available, Monitor Group, with support from NENA SWAT, looked into several ways to reduce the current system’s costs, including PSAP reconfiguration, LATA boundary relief, SSP tariff alternatives and several other network infrastructure options. A brief overview of each alternative follows.

**PSAP Reconfiguration:** Early on in this initiative, Monitor Group and NENA SWAT examined *consolidation of PSAPs as a potential way to close the funding gap by cutting costs.*<sup>24</sup> The exercise sought to bring data to bear around the following hypotheses:

- PSAPs may currently be organized in inefficient patterns
- The poor organization of PSAPs is the cause of substantial incremental Phase II deployment costs for some stakeholders

The results of the analysis showed that while there was some potential for cost savings with respect to Phase II deployment, the amount was small relative to the total funding gap. More substantial savings might be achieved in PSAP staffing and operating costs, however the social and political costs might be high. The analysis showed that under the most extreme scenario of reducing the number of PSAPs down to two PSAPs per state, there was a cost savings of \$650 million per year, with the overwhelming majority of the savings coming from staff reductions. However, given pervasive anecdotal evidence that many PSAPs are currently under-staffed, a substantial portion of any savings achieved might need to be reinvested to ensure high quality service. Moreover staff savings would accrue to the local public safety agencies, who themselves face tremendous budget pressure, making it difficult to redirect savings toward wireless E-9-1-1 deployment. This analysis does not imply that localities should not look for consolidation opportunities where appropriate to reduce costs and improve service. But it does indicate that PSAP consolidation is likely to not be the prime source of closing the funding gap.

The analysis considered migrating the current PSAP configuration to one of six endpoints, each of which would ensure that all counties would have access to Phase II E9-1-1 service. The migration paths considered establishing Phase II capable facilities in Greenfield counties, upgrading existing facilities to Phase II capability, and merging facilities with ones previously upgraded to Phase II capability. The paths are described as follows, in order of increasing consolidation:

- *Control Scenario* — A Phase II PSAP is established in every Greenfield county and all existing PSAPs are upgraded to Phase II compliance. No mergers occur.
- *Upgrade Greenfields* — A Phase II PSAP is established in every Greenfield county meeting a population threshold of 20,000. Greenfield counties not meeting this population threshold will be served by neighboring counties. All existing PSAPs are upgraded to Phase II compliance. No mergers occur.
- *Establish a Minimum PSAP Serving Size of 10,000* — A Phase II PSAP is established in every Greenfield county meeting a population threshold of 10,000, while Greenfield counties below the threshold are served by neighboring counties. All existing PSAPs serving the threshold population are upgraded to Phase II, while all remaining PSAPs are merged with neighboring facilities.
- *Establish a Minimum PSAP Serving Size of 20,000* — A Phase II PSAP is established in every Greenfield county meeting a population threshold of 20,000, while Greenfield counties below the threshold are served by neighboring counties. All existing PSAPs serving the threshold population are upgraded to Phase II, while all remaining PSAPs are merged with neighboring facilities.
- *One PSAP per County* — A Phase II PSAP is established in every Greenfield county. In non-Greenfield counties, only the most advanced PSAP is upgraded, and remaining PSAPs merge with the upgraded PSAP. In exceptionally large counties, an additional PSAP is upgraded for every additional 600,000 residents.
- *Two PSAPs per State* — The two PSAPs within each state serving the largest populations are upgraded to Phase II capability. All remaining PSAPs merge with the upgraded ones.

The process of translating these scenarios into meaningful financial estimates involved multiple steps: constructing a model that could analyze them, developing assumptions about the costs to upgrade or merge PSAPs and finally performing the analysis.

The model, developed originally for the cost analysis, categorized the major expenses involved in achieving ubiquitous Phase II compliance. In the reconfiguration analysis, assumptions were made around these expenses to

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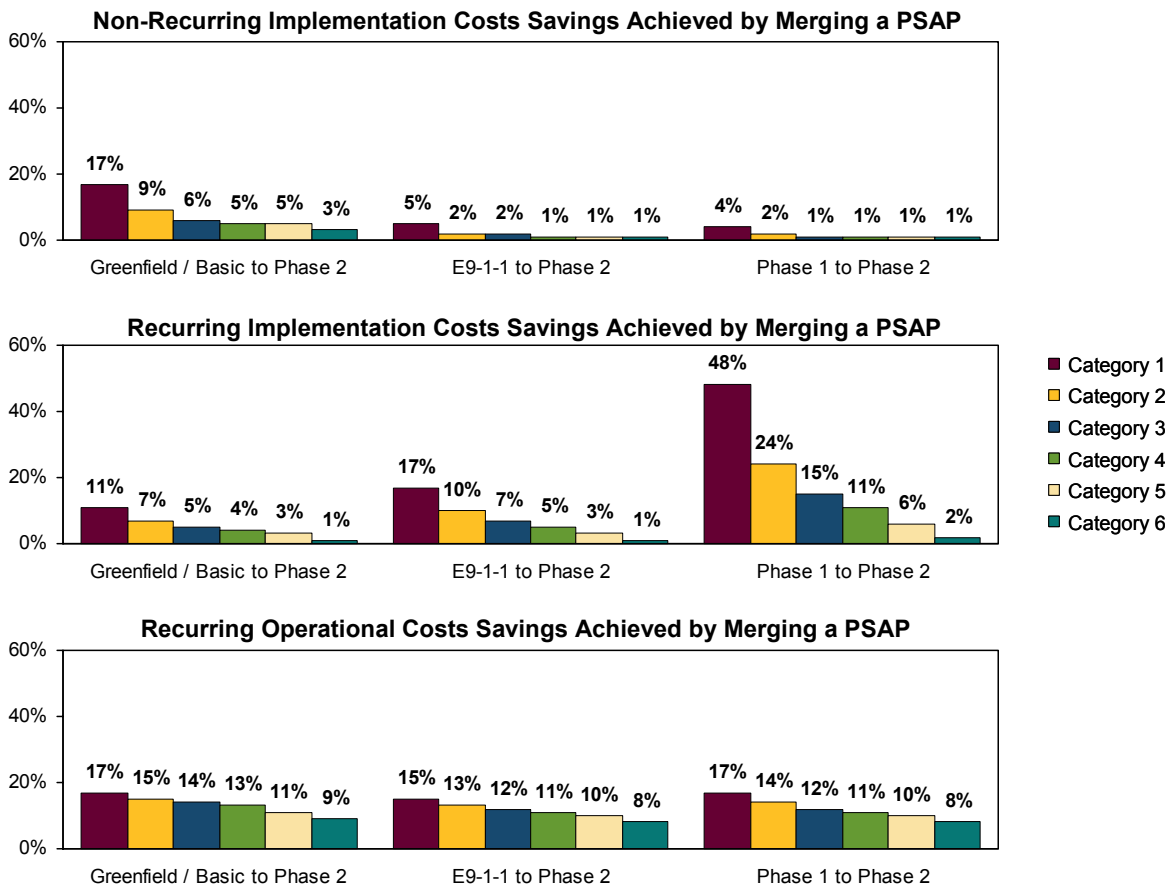
<sup>24</sup> It is important to note that this analysis was conducted in Spring 2003 and has not been updated for the August 2003 quarterly carrier deployment filings. Nevertheless, the conclusions of the analysis would likely not be materially changed even with the updated quarterly filing data.

determine whether each expense was fixed, variable or semi-variable with respect to mergers (i.e., Is the expense unnecessary, required or reduced if the PSAP merges to a Phase II PSAP instead of upgrading independently?) Together with the cost model, these assumptions allowed us to quantify the cost avoidance of Phase II implementation under reconfiguration to be relative to the control scenario. In addition, these assumptions allowed ongoing operating costs to be considered under each of the reconfiguration scenarios and compared to the control.

The key assumptions used in this analysis were:

1. A series of individual assumptions about how costs varied under merger versus upgrade conditions for PSAP of different serving populations,
2. That recurring and non-recurring Phase II merger costs were scaled back from Phase II upgrade costs by the same ratio,
3. That merging PSAPs will not surpass any equipment volume thresholds,
4. That all mergers occurred within the same LATA, and
5. That once a PSAP merged with a Phase II PSAP a new round of certification is required.

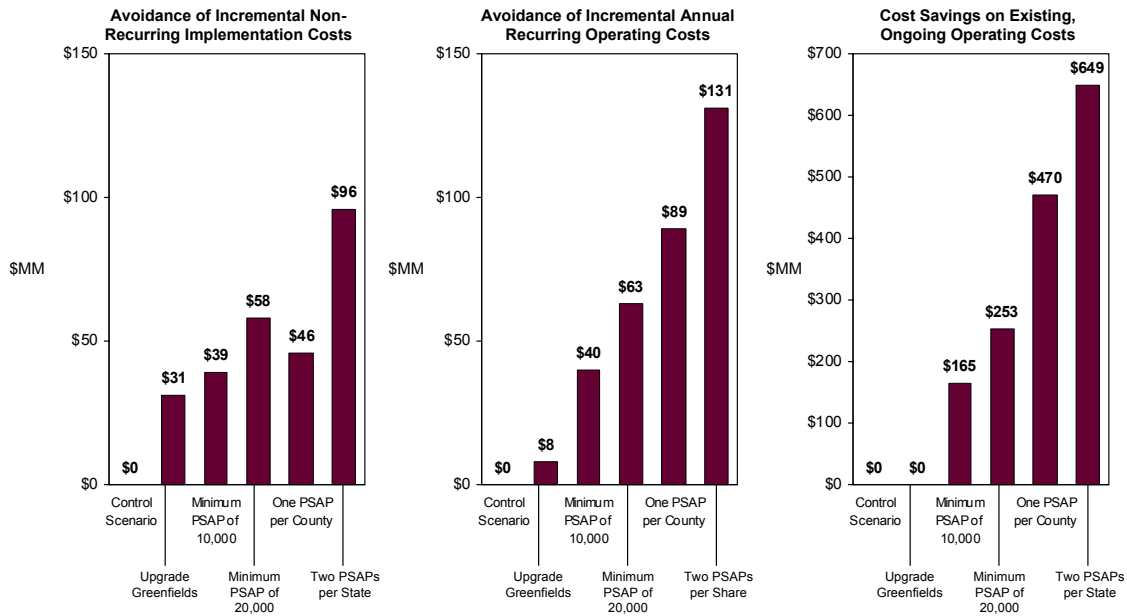
Assumptions 3 and 4 are thought to lead the analysis to overstate the potential cost avoidance of reconfiguration, though their effect is somewhat mitigated by assumption 5. Nonetheless, all cost avoidance values indicated below are suspected to be at the upper end of their potential ranges. In all, merging a PSAP to Phase II compliance rather than upgrading it is believed to save 1%–17% of non-recurring implementation costs, 1%–48% of recurring implementation costs and 8%–17% of ongoing operating costs:



Ultimately, the analysis concluded that if PSAPs were more efficiently configured, only minimal Phase II costs could be avoided, and that the major beneficiary of this cost avoidance would be the public safety community. Even under the most extreme consolidation example — reducing PSAPs to two per state — the analysis suggests that, in aggregate across all states, only \$96 million of one-time costs Phase II could be avoided, and \$131 million of recurring Phase II costs. These values decrease considerably when more politically tenable scenarios are considered. While reconfiguring PSAPs would provide limited direct cost benefit to wireless and wireline service providers relative to the effort required, efficient PSAP configuration might greatly reduce the operational complexity of Phase II implementation. Nevertheless, consolidation also probably would extend the overall PSAP readiness timeline, given the time it would take, and the complexity of making it happen in an already overburdened system.

The real opportunity for savings exists in the ongoing day-to-day operations of PSAPs, where, feasibly, several hundreds of millions of dollars might be saved annually, perhaps reaching as high as \$650 million. In all these cases, the primary beneficiary of savings will be the public safety community as the greatest cost avoidance occurs in areas for which they are responsible (e.g., staff and overhead costs). If there is sufficient political will among the state and local authorities, substantial benefit from reconfiguration may be achieved; however, these benefits will have to be weighed against the consequences of reduced local control and redundancy.

The results, shown below, illustrate the potential impact of reconfiguration on a national basis:



It is important to note that the above figures are meant to illustrate the upper boundary of cost savings potential. No allowances for merger integration costs or impact on related operations such as dispatch have been taken into account.

**LATA Boundary Relief:** LATA boundaries for 9-1-1 appear to be a significant barrier to cost-effective deployment. Removal of LATA boundaries would aid Greenfield deployment efforts and facilitate eventual upgrades to the network architecture including selective router consolidation. While some parties suggest that existing rules already adequately allow for inter-LATA 9-1-1 communications, some SSPs adhere to more strict interpretation and are thus constrained. At a minimum further clarification of these rules would be beneficial. The following is a summary of the rationale for LATA boundary relief:

- Increases system reliability through pairing Selective Routers to provide redundancy in a cost effective manner
- Reduces costs of implementing 9-1-1 in 333 Greenfield counties
  - Allows connection to most appropriate selective router in the state, regardless of LATA boundaries

- Annual cost avoidance of \$1.4 million (4,100 mile reduction in EO to SR and SR to PSAP connections per trunk)
- Obviates need for selective router upgrades in up to 12 counties
  - One time cost avoidance of up to \$18 million (\$1.5 million per SR)
- Facilitates national emergency communications
- Enables eventual selective router consolidation
  - Allows WSPs to connect to 2 geographically diverse selective routers instead of every selective router in the state
    - Avoids incremental trunking charges for WSPs
    - Requires central selective routing database

Reduces IXC charges by allowing SSPs to carry inter-LATA 9-1-1 traffic on corporate facilities

**SSP tariff efficiencies:** Current tariff mechanism for SSPs could provide a source of improved efficiency or total system cost-reduction. The wireline industry’s traditional methods of cost recovery and ability to earn a rate of return on investment have been undergoing fundamental changes as the industry opens to competition. Some ILECs and technology providers may consider the tariff mechanism to be increasingly inconsistent with this emerging deregulated environment. While it is clear that SSPs have made great strides in E9-1-1 deployment, occasional deployment barriers arise due to the tariff process, aspects of which are considered unsatisfactory by both SSPs and PSAPs. On the one hand, the slow pace of E9-1-1 adoption compared to the assumptions built into many existing tariff structures disrupts SSPs’ ability to obtain timely returns for their substantial capital outlays. In addition, 9-1-1 related tariff mechanisms alone often provide insufficient incentives for SSPs to obtain full prioritization of E9-1-1 within their own organizations *or to promote providing lowest cost services with the most up to date equipment*. On the other hand, some PSAPs and state 9-1-1 organizations feel that SSP charges are in some cases too high, and that the tariff process does not adequately address these concerns.

Several alternative models exist to the current SSP tariff mechanism:

- Move to pure competitive bidding for SSP services on a statewide basis (based on the belief shared by some SSPs that only a fundamental change, e.g., moving away from the current tariff mechanism, would be helpful. While no comprehensive examples for this exist, Wisconsin has considered, though not implemented, statewide competitive bidding on parts of the 9-1-1 system<sup>25</sup>).
- Create national consistency in tariff items and / or pricing to reduce uncertainty and drive to the lowest cost. This alternative may require significant lead time to potentially renegotiate rates in 50 separate states in line with a national tariff schedule.

### Other Network Infrastructure Options

- SR consolidation / network reconfiguration: Implementing the first advance envisioned in NENA’s Future Path Plan (see section 8.3), might allow for substantially reduced trunking charges from MSCs to SRs.
- ALI consolidation: Further analysis would be required to prove the benefits. Initial reactions from the subject matter experts on the NENA Technical Team suggest national level consolidation would not be efficient or economic. Still, small-scale consolidation may make sense on a case by case basis.
- Shared WSP PDE: During the FCC coordination initiative, an equipment vendor questioned why shared PDE was not being pursued. At first glance, there would appear to be some cost savings potential in this area. However, detailed assessments of carrier network footprint would be required to identify areas of overlap to account only for areas with common site location and like technology solutions.

<sup>25</sup> Wisconsin State Legislature passed wireless E9-1-1 legislation, Act 43, in 2003, which included provisions for state-wide purchasing of equipment and services currently purchased by local authorities. This provision of Act 48 was vetoed, due to concerns of taking away flexibility and decision rights of local authorities.

## 5 State and Federal Coordination and Oversight

### 5.1 Overview

The centrality of the coordination challenge in the E9-1-1 problem has been noted already by this and other E9-1-1 related initiatives (e.g., FCC’s Hatfield Report). With over 6,700 PSAPs, each with different jurisdictions, facilities and resources, geographical considerations, technologies and knowledge bases, the physical challenges of deployment and coordination are considerable. Those challenges are even more daunting, however, due to the lack of appropriate coordination:

- **National Coordination:** Driving interstate coordination is a significant challenge, particularly because WSPs and SSPs cross state boundaries, while PSAPs and state / local government authorities do not. The federal government has an obvious interest in E9-1-1 as a national, public good and a homeland security imperative. The federal interest has historically been manifest by FCC leadership, but through the recent Department of Transportation (DOT) initiative it has also displayed leadership. Recently E9-1-1 has been put on the discussion agenda in Congress, as evidenced by the creation of the E9-1-1 Caucus, the E9-1-1 Institute, and the recently passed House and pending Senate legislation. Other cabinet agencies such as Department of Homeland Security (DHS) and Department of Defense (DOD) have also been involved in discussions on E9-1-1. While there has been dedicated federal interest in accelerating E9-1-1 efforts, no single federal entity has claimed sole responsibility for overseeing E9-1-1.
- **State Level Coordination:** Currently of the 50 states and Washington D.C., only 33 have any form of coordination office in place. While few question the importance of coordination, the apparatus and provision of public safety remains a highly local<sup>26</sup> — and decentralized — endeavor. A clear trade-off exists between coordination by a central body and giving state and local authorities the ability to exercise their rights to drive public safety decisions. A Monitor Group analysis of E9-1-1 deployment barriers supports the state level view; it indicates that the presence of a strong state coordination function is (among other important factors) a significant factor in E9-1-1 deployment. In a multivariate regression analysis, the extent of state coordination showed a 95% significance of being positively correlated with increased Phase I and II deployment. (See Section 11 for more details.) Further, in interviews with both public safety officials, and industry members, most interviewed believe the benefits of state coordination accrue not only to states’ PSAPs, but also to WSPs and SSPs, by improving the economics of their Phase II deployment. These findings provide additional support to previous initiatives and legislation, notably the DOT Secretarial Initiative and the Wireless Communications and Safety Act of 1999, which cite the benefits of state-wide coordination.

An evaluation of coordination options requires the assessment of trade-offs among timeliness, managing inherent system complexity, and balancing federal vs. state / local decision rights. A critical role for both state and national coordination bodies is augmenting political will at the local level via grassroots and “grasstops<sup>27</sup>” education and awareness-building. Coordinated, consistent programs to impress on local leaders and constituencies the importance and benefits of E9-1-1 will encourage active engagement by all relevant stakeholders and help to drive implementation. 9-1-1 coordinators, public safety organizations, industry, and other 9-1-1 officials must work at the federal, state, and local levels to educate and raise awareness among consumers, legislators, and public safety officials. While a consistent nationwide message will help to ensure that all relevant parties dedicate themselves to the successful implementation of E9-1-1, education-and-awareness efforts must also be tailored to individual regions and constituent groups.

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<sup>26</sup> “Local control” is an important factor in the delivery of 9-1-1 services. In most cases, the police and fire departments in the cities, towns and counties provide 9-1-1 services. In some cases, the service is provided by state agencies (e.g., State Police, University Police), and federal agencies (e.g., US Park Police, National Park Service). For many counties, 9-1-1 falls into this public safety sphere due to its linkage with the dispatch agencies. In home rule states, where the right to govern “local” matters has been extended by the state to the counties or localities, this phenomenon is even more pronounced. Home rule refers to the granting of the rights to cities and counties to regulate purely local matters without direction from the state legislature. Home rule can be attained automatically through the state’s constitution or via an act of a state legislature. Two type of home rule states exist: 1) states where home rule is extended to all counties or localities, and 2) states where home rule is extended to only municipalities exceeding a certain population threshold.

<sup>27</sup> “Grasstops” refer to local leaders, politicians, and heads of public safety.

## 5.2 Policy Considerations for State and Federal Coordination and Oversight

### *State-level Coordination and Oversight Considerations*

Analysis of state coordination models and review of the findings from other initiatives (e.g., Hatfield Report, Wireless of 1999, DOT Secretarial Initiative) suggests that single points of contacts for E9-1-1 coordination within a state can significantly help deployment both in terms of acceleration and efficiency. Considerations for the scope and authority of this role include the following:

- *Managing and coordinating intra-state deployment:* A state coordination function may be in the best position to understand the various regional situations within local government jurisdictions, to structure a deployment plan according to these needs, and to identify ways to increase deployment efficiencies (e.g., staggering WSP testing schedules), if needed. Additionally, a state level coordinator may be more likely, in most circumstances, to gain the trust of local public safety officials than would a federal level coordinating body.
- *Coordinating inter-state deployment:* Addressing deployment inefficiencies in conjunction with neighboring states may help a state coordination function to complete their PSAP deployment in a timely and more cost-effective manner.
- *Coordinating / monitoring of valid requests and mediating disputes:* Given that a state coordination function likely has substantial local knowledge, they may be in the best position to mediate readiness disputes, if necessary and requested, between SSPs, WSPs and PSAPs. State coordination functions may have more impact and control over the overall statewide timelines, as they will be more closely attuned to potential obstacles.
- *Disbursing and auditing of federal grants and reconciling budgets:* State coordination functions are in the best position to serve as single points of contact and serve as the entity accountable for distribution and appropriate use of federal funds.
- *Educating and building awareness:* Interviews with local government PSAP managers and officials indicate that lack of education and awareness has been a barrier to wireless E9-1-1 deployment. State coordination functions may have the best vantage point to understand the knowledge gaps, the availability of educational materials, and the appropriate educational campaigns required for the impacted stakeholders (e.g., state and local officials, general public, public safety personnel).

### *Federal / National-level Coordination and Oversight Considerations*

Although a federal body can play a number of critical roles, instituting federal level coordination and oversight, in addition to any existing state-level coordination, can create additional layers of bureaucratic burdens. Thus, in crafting an appropriate role for a federal / national oversight body, considerations on specifics of the role should include the following:

- *Mediating disputes:* A secondary point of mediation on readiness disputes after state coordinators may be necessary, especially if requested by PSAPs, WSPs, SSPs, or state coordination functions. A federal body can play an important role in ensuring that WSPs and PSAPs are being treated consistently and fairly across all states in readiness disputes. By resolving some of the most challenging disputes, the federal body can also help ensure that state coordination functions are not diverted from other important day-to-day duties.
- *Coordinating nationwide deployment:* A central point for scheduling / staggering nationwide deployment and for PSAPs serving adjacent states may be necessary in some circumstances, and could augment state coordination efficiency-related gains on a broader level. While PSAPs are managed on a local, regional or statewide basis, wireless carrier WSPs tend to be managed on a regional and often nationwide basis.
- *Coordinating constituent initiatives:* The SWAT, E9-1-1 Stakeholder Initiative, and other initiatives have demonstrated that there is value for key parties responsible for delivering E9-1-1 to convene a joint dialog and develop joint perspectives. An opportunity exists for a federal body to foster the formation of similar



groups, as well as coordinate amongst these groups to promptly address difficult or unresolved issues (e.g., rural requirements for WSP, funding for future technology, future proofing and incorporation of new devices, and coordination of standards development where appropriate).

- *Interfacing with technical standards bodies:* Several initiatives and bodies (e.g., EISF, DOT Secretarial Initiative) currently develop standards relating to 9-1-1. A need exists for an entity to help promote common standards across the nation, working with existing standards settings bodies, interpreting recommendations, and suggesting standards and protocols.
- *Evaluating and disseminating best practices:* A key aspect of educating the public safety, local, and state officials on 9-1-1 implementation is an aggregation and evaluation of best practices on state coordination models, cost recovery mechanisms for WSPs, and various technology / operational solutions. Coordination with other public safety organizations (e.g., NENA, APCO, NASNA) and other initiatives will be important to streamline opportunities for sharing best practices.
- *Building awareness and education for E9-1-1:* A champion is needed, working with national public safety organizations such as NENA, APCO, and NASNA, to motivate states and local governments to prioritize their E9-1-1 commitments, to help them overcome any implementation hurdles, and raise awareness with the general public.

### 5.3 Relevant Coordination and Oversight Models

#### State-level Models

As States evaluate how to best foster E9-1-1 deployment, a review of several existing coordination models employed by various states may be useful. The following examples illustrate three different types of state coordinating models and the responsibilities typical of each:

- Communications Mobile Radio Service (CMRS) Board
- State Wireless 9-1-1 Board
- State Wireless 9-1-1 Board and Regional Councils / District Governments

#### 1. CMRS Board Coordination Model

CMRS boards represent the most limited, narrowly defined coordination role of the three examples. A CRMS board is typically legislated into existence with the primary purpose of managing and disbursing 9-1-1 funds, though the members of the board may engage in a broader range of activities. In order for such a model to co-exist with the necessarily increased level of state coordination, legislation would need to expand the role of the CMRS Board to include the roles outlined above for a state coordinator.

A CMRS Board is generally an effective manager of funds, but its ability to further affect deployment of E9-1-1 is often limited. In Arkansas, for example, a 5 member board<sup>28</sup> is primarily responsible for collecting and disbursing funds. Though limited resources and lack of legislative mandate restrict the ability of the board to aggressively pursue E9-1-1 deployment, a part-time employee of the board fulfills an educational and mediation role.

Coordination Body (State Model)	State Coordinator	Typical Duties / Responsibilities
CMRS Board (Arkansas)	<ul style="list-style-type: none"> <li>• Not typically</li> </ul>	<ul style="list-style-type: none"> <li>• Primary purpose is to manage and disburse funds, manage surcharges</li> <li>• May provide ad hoc financial / technical / legal education for localities</li> <li>• Does not provide central procurement, though may informally advise PSAPs on equipment decisions</li> <li>• No centralized state / regional deployment schedules, though may mediate validity of requests for PSAPs / WSPs</li> </ul>

<sup>28</sup> Two public safety representatives, two WSP representatives, and a representative from the state Auditor office.

**2. State Wireless 9-1-1 Board Coordination Model**

A State Wireless 9-1-1 Board, created through legislation or by a state agency or official, will generally have broader responsibilities than a CMRS Board and may have a greater chance of having a more materially positive impact on E9-1-1 deployment. Responsibilities may include some level of funding collection and disbursement, educational activities, and perhaps procurement or deployment planning responsibilities.

For example, Indiana’s Wireless Advisory Board has been a major factor in the success of E9-1-1 deployment in that state. This is likely due, in large part, to the board’s broad mandate: distribution of wireless 9-1-1 surcharges, management of a robust educational campaign, mediation between PSAPs and carriers, strong state level advocacy, and an advisory role for PSAPs during implementation. By law, the State Treasurer serves as the chair of the Wireless Advisory Board. This helps to ensure the board has access to state leadership and legislators on an ongoing basis and establishes 9-1-1 as a visible priority for the state.

California provides a different model of using a State Wireless 9-1-1 Office for coordination. The California 9-1-1 Emergency Communications Offices, under the auspices of the Telecommunication Division of the Department of General Services, has several functions. These include consulting with local PSAPs; recruitment of PSAPs for participation in regional deployment efforts (which are voluntary for the local government agencies that provide wireline 9-1-1 call taking); reviewing and approving procurement of CPE equipment within guidelines established by the program manager; paying for infrastructure, database and other services provided by the SSPs; paying for portions of the costs to connect WSPs to the 9-1-1 network; and funding limited public education programs operated by the PSAPs. The wireless deployment is managed by an employee of the State 9-1-1 Emergency Communications Office. Regional PSAP coordinators were recruited to assist the WSPs and the state program officials in deploying wireless 9-1-1 services via one point of contact; they enable centralized rollout of common critical deployment processes. However, due to constraints on resources, California (unlike Indiana) has been unable to engage in extensive educational efforts. California has also been subject to diversion of 9-1-1 funds, a situation that Indiana (with coordination functions vested in the Treasurer’s office) has thus far been able to avoid.

Coordination Body (State Model)	State Coordinator	Typical Duties / Responsibilities
<p><b>State Wireless 9-1-1 Board (Indiana, California)</b></p> <ul style="list-style-type: none"> <li>• Either reports directly to a state official or through the chain of command of other state departments</li> </ul>	<ul style="list-style-type: none"> <li>• Member of Board may act as “coordinator,” or Board may work in concert with official coordinator</li> </ul>	<ul style="list-style-type: none"> <li>• Central collection and disbursement of funds</li> <li>• May provide some formal financial, technical, operational education for wireless E9-1-1 to localities</li> <li>• State may negotiate master contracts with select equipment / service providers, though participation in master contract may be optional</li> <li>• State-driven deployment timelines, though potentially with regional variation or voluntary PSAP participation</li> </ul>

**3. State Wireless 9-1-1 Board and Regional Council / District Government Coordination Model**

In the third and perhaps most expansive type of coordination model, a State 9-1-1 Board and Regional Planning Councils cooperatively administer 9-1-1 programs. The State 9-1-1 board organizes statewide funding collection and disbursement, educational activities, procurement and deployment planning activities, while the regional planning councils manage regional funding collection and regional disbursement and deployment planning. This arrangement provides adequate state- level coordination while retaining local autonomy.

In Texas, the Commission on State Emergency Communications (CSEC) administers the state’s 9-1-1 program through a partnership with the state’s 24 Regional Planning Commissions (RPC), or Councils of Government

(COGs).<sup>29</sup> Legislation governs the responsibilities of CSEC<sup>30</sup> and the requirements placed on COGs.<sup>31</sup> Funding for the implementation of these plans is provided through emergency service fees, which are collected and used on a regional basis. Surcharges levied on long-distance charges are collected and distributed as needed on a statewide basis.<sup>32</sup>

Coordination Body (State Model)	State Coordinator	Typical Duties / Responsibilities
<b>State Wireless 9-1-1 Board and Regional Councils / District Governments (Texas)</b>	<ul style="list-style-type: none"> <li>Not necessarily, though Board may have member identified as “coordinator”; regional councils may have own “coordinator”</li> </ul>	<ul style="list-style-type: none"> <li>Central and local / regional collection and disbursement of funds; regional deployment plans may be required for state fund disbursement</li> <li>May provide some formal wireless E9-1-1 educational effort at the local / county level to address awareness, funding, technical, and operational issues</li> <li>Regional Councils are required to select solutions from state list in regional plans</li> <li>Regional planning commissions are required to develop regional plans</li> </ul>

The state models above demonstrate the variety of approaches that is available to a state as it contemplates a 9-1-1 coordinating function.

### *Federal / National-level Models*

In delineating the policy considerations for federal / national-level coordination and oversight, Monitor Group examined a number of possible models and structures for a limited national / central authority ranging from federal agencies to privatized solutions. These models (outlined in the chart below) illustrate both successful and unsuccessful characteristics from which policy makers can draw upon. Lessons learned from relevant analogies are also outlined in the section below.

<sup>29</sup> “Regional councils are voluntary associations of local government formed under Texas law. These associations deal with problems and planning needs that cross the boundaries of individual local governments or that require regional attention. Regional councils coordinate planning and provide a regional approach to problem solving through cooperative action.” <http://www.txregionalcouncil.org/what.html>

<sup>30</sup> By law the CSEC is responsible for 1) administering the implementation of statewide 9-1-1 service 2) developing minimum performance standards for equipment and operation of 9-1-1 service to be followed in developing regional plans 3) examining and approving or disapproving regional plans 4) recommending minimum training standards and providing assistance in the establishment and operation of 9-1-1 service 5) developing and providing public education materials and training 6) assisting in database development 7) providing grants or contracts for services and 8) coordinating emergency communications services and providers.

<sup>31</sup> By law the regional planning commissions are required to develop regional plans

<sup>32</sup> Not all counties are administered by the RPCs and the State Program. Some counties’ 9-1-1 services are administered by independent Emergency Communications Districts, and some municipalities’ 9-1-1 services are administered internally (Home Rule Cities).

	Description	Pros	Cons
<b>Strong Federal Oversight</b>	Creates a new authority within a cabinet agency (e.g., DHS) to centrally coordinate and enforce State / local implementation	<ul style="list-style-type: none"> <li>Existing precedent to lead and coordinate national initiatives</li> <li>May increase viability of federal funding</li> <li>Ability to draw on / influence a wide array of players</li> </ul>	<ul style="list-style-type: none"> <li>Abrades States' rights</li> <li>Additional bureaucracy</li> <li>Harder to involve non-governmental stakeholders</li> </ul>
<b>Increase FCC's Leadership</b>	FCC undertakes new authority to provides central coordination and oversight over state/local implementation of 9-1-1	<ul style="list-style-type: none"> <li>Expert knowledge of 9-1-1 issues</li> <li>Clear jurisdiction over carriers</li> <li>History of stakeholder interaction</li> </ul>	<ul style="list-style-type: none"> <li>Abrades States' rights</li> <li>Negative history with some stakeholder groups</li> </ul>
<b>Federal Support to State Leadership</b>	A new entity provides audited federal E911 money to states qualified by their proven dedication to E911	<ul style="list-style-type: none"> <li>Federal charter and funding provides clear coordination</li> <li>Allows leadership at the action level; i.e., the states</li> <li>Broad stakeholder engagement and representation</li> </ul>	<ul style="list-style-type: none"> <li>Difficulty in delineating Federal and State coordination roles</li> <li>Potential to become bureaucratic</li> </ul>
<b>Public — Private 9-1-1 Council</b>	A broad group of stakeholders creates a council to coordinate and oversee national 9-1-1 with no federal authority of leadership	<ul style="list-style-type: none"> <li>Non-threatening jurisdictionally</li> <li>Can maximize grass-roots power to influence change</li> </ul>	<ul style="list-style-type: none"> <li>Little ability to sanction recalcitrant stakeholders</li> <li>Lack of authority to create binding solution</li> <li>Unlikely to sustain coalition long term</li> </ul>
<b>Status Quo</b>	Federal government has little to do with E9-1-1; the FCC exerts pressure on LECs and WSPs for progress. States each have different approach	<ul style="list-style-type: none"> <li>Continuity with present environment</li> </ul>	<ul style="list-style-type: none"> <li>Coordination issues surfaced in Initiative unlikely to be resolved positively</li> </ul>

### *Lessons Learned from Relevant Analogous Coordination and Oversight Bodies*

A number of relevant analogies for central coordination and oversight have informed the findings of this Initiative, including the Universal Service Administrative Company (USAC) and E-rate (Schools and Libraries Universal Service Support Mechanism), the North American Numbers Council (NANC), The Communications and Law Enforcement Act (CALEA), The National Minimum Drinking Age Act, The Health Insurance Portability and accountability Act of 1996 (HIPPA), the Coalition for Affordable Local and Long Distance Service (CALLS), the Advisory Committee on Advanced Television Services and the Grand Alliance for High Definition Television (HDTV), and the Galludet Program for TTY.

The primary national coordination bodies that have been evaluated in depth are *Universal Service Administration Company (USAC)*, a private, not-for-profit corporation responsible for providing every state and territory in the United States with access to affordable telecommunications services through the Universal Service Fund, and *North American Numbers Council (NANC)*, a federal advisory committee created to make recommendations to the FCC on numbering issues. Evaluating the successes and failures of these agencies can help to provide insights into potential features for any possible central coordination body contemplated by policy makers.

Three features emerge from these evaluations as being particularly critical:

- Ability to Make and Enforce Timely Decisions:** In order to meet the policy goal of timely deployment, any type of oversight body must, in an efficient and productive manner, be capable of making decisions that have a strong amount of national influence. A key drawback of NANC, is its lack of speed, largely due to a consensus-driven decision-making model that has often left its members deadlocked. Any national level 9-1-1 coordination body needs to adopt procedures that promote an efficient and timely decision-making process (e.g., voting mechanisms that prevent deadlock, incentives for members to make

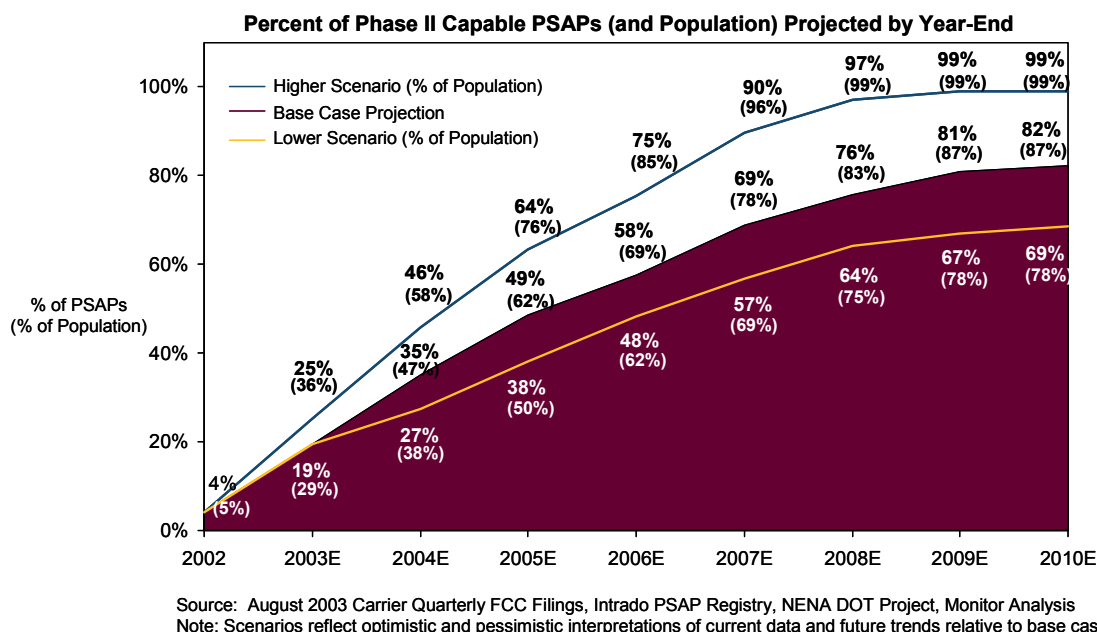
timely decisions, etc.). USAC offers a positive example of a national authority that is able to coordinate and enforce guidelines across all 50 states and 4 territories.

- *Diverse and Balanced Membership:* The make-up of any coordination body should aim to ensure that all relevant parties bring their expertise and voice to the decision-making process. USAC provides a model for how this diversity can be ensured and specifies in its bylaws the qualifications, representation and number of directors.
- *Proper Oversight Mechanisms:* The waste, fraud and abuse charges leveled against USAC and E-Rate represent cautionary tales to creating another similar quasi-governmental body. To address these concerns, the design of any coordinating body must include oversight features such as transparent and regularly scheduled auditing procedures and clear provisions for the discipline or removal of board members as a recourse to unsanctioned action.

## 6 PSAP Environment, Archetypes, and Deployment Timeline Projections

### 6.2 Overview

As indicated in the chart below, **likely less than 20% of PSAPs will be Phase II capable by year-end 2003. More concerning still, likely less than 50% and less than 70% will be Phase II capable by 2005 and 2007 respectively** — this despite the fact that, driven by the FCC’s near-term mandated timelines, WSP Phase II deployment for both network and handset players is expected to be well in excess of these figures.<sup>33</sup>



The balance of this section provides considerations for applying PSAP deployment timelines, Monitor Group’s PSAP classification and archetype analysis, and PSAP deployment timeline projection methodology and analysis.

### 6.2 Policy Considerations for PSAP Deployment Timelines

Currently, there are no nationwide requirements on PSAPs to complete deployment by a certain deadline. Rather, most timeline requirements have fallen on WSPs, a situation that causes two potential problems: First, focusing requirements in a multi-party system primarily on only one of those parties inhibits coordinated action toward driving E9-1-1 deployment. Secondly, the performance requirements for WSPs, if strictly followed without appropriate flexibility, may lead to unintended outcomes that could compromise public-safety goals – for example, reducing basic wireless coverage and competition in less-profitable areas, or forcing consumers to surrender legacy handsets. Many parties involved in 9-1-1 implementation favor application of the principle that it is undesirable for any one party to hold significant amounts of stranded investment while others are catching up, whether for PSAPs, WSPs or SSPs.

The question of whether and how PSAP deployment timelines should be implemented (e.g., consistent nationwide timeline, state customized deployment timeline, or no timeline), should factor in the following considerations:

- Ubiquity and timeliness are core policy goals for any E9-1-1 deployment solution, which may imply a need for state-level timelines,

<sup>33</sup> Refer to Section 6.3 for an explanation of why WSP deployment in 2005 and 2007 may be in excess of projected deployment figures.

- However, a respect for state and local decision rights in 9-1-1 implementation, premised on states’ superior knowledge of local constraints and the inherently local nature of 9-1-1 service delivery, might suggest that externally mandated timelines would be inappropriate
- Increased synchronization of timelines between all parties is desirable
- However, avoidance of the “mad – dash” phenomenon (to the extent possible) in which all parties wait until any mandated deadline before making any deployment changes, effectively overloading the system, is also desirable;
- Ideally, stranded investments by both WSPs and SSPs should be avoided or minimized

## 6.3 PSAP Classification Methodology and Analysis

Monitor Group’s analysis of the PSAP deployment rates under status quo conditions and hypothetical “barrier-breaker” assumptions is based on an understanding of PSAP Archetypes. This section will describe the methodologies used to define each archetype and classify PSAPs into archetypes. It will also describe the deployment assumptions ascribed to each archetype.

### *Determining the Number, Size and Current Status of PSAPs*

Three primary data sources were used to triangulate on the quantification of the PSAP landscape: Intrado PSAP Registry, NENA / DOT Project data, and official state PSAP lists. Two secondary sources were then used to corroborate this triangulation: Select conversations with state coordinators and quarterly FCC carrier filings.

The Intrado PSAP Registry,<sup>34</sup> listing 7,666 PSAPs, was used as the starting basis of the quantification of the PSAP landscape. In addition to primary / secondary PSAPs, this list also included responding centers that fall outside the NENA definition of a primary / secondary PSAP.<sup>35</sup> As the Intrado registry cannot easily distinguish between these various PSAP types, NENA / DOT project data and official state lists were used to clarify the PSAP registry entries. Where official state lists existed, Monitor Group coded the Intrado registry data into three categories of PSAP types (i.e., primary, secondary, “other”). In states where state lists were not obtainable, the NENA / DOT project data were used to estimate the total number of primary and secondary PSAPs in a state, and to assign each PSAP a category label. Further refinement of this data was made based on select state coordinator interviews and ongoing quarterly FCC carrier filings. It should be noted that the Monitor Group refinements to the Intrado PSAP registry represent only a best-effort basis. An exact count of PSAPs will only be possible through direct confirmation of each and every PSAP based upon a mutually acceptable PSAP definition.

NENA / DOT Project data, used by the NENA SWAT Technical Team, identified ~333 counties with only Basic PSAPs or no 9-1-1 provision.<sup>36</sup> Any PSAPs cited in the PSAP Registry located in those counties were classified as Basic PSAPs, and a “placeholder” PSAP was created for those counties with no PSAP listed. In instances where the Registry cited multiple PSAPs in those counties, only one PSAP was retained. Duplicate PSAPs were also removed from the total count. Carriers’ February 2003 filings with the FCC were used to determine the initial Phase I and Phase II status for all remaining PSAPs.<sup>37</sup> PSAPs that were not designated as Phase I, II, or Basic were defaulted to Wireline Enhanced status. Monitor Group has continued to update and refine the Intrado PSAP registry through analysis of the May and August, 2003 FCC carrier filings and continued conversations with state

<sup>34</sup> Version provided to Monitor Group 28 February 2003.

<sup>35</sup> Primary PSAP are answering points that are fully E9-1-1 equipped and directly receives dialed 9-1-1 calls either through a dedicated 9-1-1 trunking line or a 7-digit number. Secondary PSAPs may be either: a) fully E91-1 CPE equipped centers that receives call via transfer from one or more primaries, or b) not E9-1-1 fully CPE equipped centers that may receive transferred call by voice only, with either no mechanized ALI, via ALI remote printer from primary, or via CAD link.

<sup>36</sup> Note that this analysis assumes that any county with at least one PSAP providing wireline E9-1-1 service is fully covered. In some instances, existing PSAPs may serve only a portion of the county in which they are located, resulting in additional area without 9-1-1 coverage. The solution posits that, in all such instances, the existing PSAP would expand to serve the entire county.

<sup>37</sup> PSAPs were classified as providing Phase I and / or Phase II status when at least 1 wireless carrier has deployed Phase II data to the PSAP, and the PSAP is capable of processing and interpreting the Phase II data. On the last point, not all carrier filings indicate whether a PSAP is fully capable in processing the Phase II data. Where Monitor Group has discovered that PSAPs are not able to utilize the data, the PSAP status has been correspondingly downgraded.



administrators. In instances where the carriers' filings included a PSAP not listed in the Registry, the PSAP was subsequently reconciled to either the official state list total or the NENA / DOT estimated total PSAPs — or, in some cases, through independent verification with state coordinators.

The resulting list of PSAPs includes 6,747 Primary and Secondary PSAPs (including one PSAP per county currently without 9-1-1).

To estimate the percentage of population covered by each PSAP, Monitor Group developed a methodology based primarily upon U.S. Census data and further assumptions described below. U.S. Census data were used to determine the resident population of each municipality and / or county. Since Primary PSAPs are the first point of contact for 9-1-1 calls, the entire U.S. Population was attributed to 100% of the primary PSAPs, regardless of current deployment status. Population was assigned to secondary PSAPs primarily in order to determine PSAP size, a critical feature of the cost-estimation effort. Secondary PSAPs may serve either as a backup center to a primary PSAP or as a first point of contact with the emergency victim after the call is triaged and routed by the primary PSAP to the secondary PSAP. NENA estimates that about 20% of the calls received by PSAPs are true emergency calls. These are the set of calls that are most likely to be transferred to a secondary PSAP under the latter definition of a secondary PSAP. This percentage was used as a proxy to allocate an additional 20% of the U.S. population to Secondary PSAPs.

Monitor Group then assigned each PSAP a code that determined whether it services primarily a city or a county boundary. Census population data were then assigned to each PSAP serving a particular city. In instances where multiple PSAPs exist in a city, the population was divided evenly among the PSAPs.<sup>38</sup> Multiple PSAPs serving counties were assigned the remaining county population after all appropriate city population had been assigned to the city-oriented PSAPs. This methodology resulted in a classification of the PSAPs by size category, according to the population each PSAP serves.

### *PSAP Archetypes*

A PSAP archetype represents a distinct clustering of similarly behaving PSAP situations, covering the PSAP's technical, operational, administrative, funding and supply / demand contexts. Each PSAP archetype has been designed such that PSAPs within an archetype share similar barriers to deployment, requirements and trade-offs regarding a particular solution.

Monitor Group has constructed the PSAP archetype by first identifying descriptors (or variables) that are significant determinants of distinct behavior and needs of common groups. The descriptors should also be actionable; that is, the descriptors should enable identification of the members of the particular group and be verifiable through qualitative or quantitative data sources. Examples of such descriptors include political will, presence of sufficient funding, and existing 9-1-1 services provided.

A list of potential descriptors was developed and tested through primary interviews with PSAP operators, carriers, public safety, and government. In addition, participants in the NENA SWAT initiative discussed and provided substantial input to the descriptors. The descriptors were subsequently used to define the axes of a PSAP Archetype Map (see below for example) on which any PSAP could be evaluated and placed. As shown in the figure below, four descriptors define the PSAP Archetype Map.

They are:

- *Current PSAP status* (Wireless Phase II, Wireless Phase I, Wireline Enhanced, Basic, Greenfield): The highest degree of 9-1-1 call answering in use at the PSAP, where Basic indicates that enhanced call data is not available. Data to classify PSAPs has been obtained through the Monitor Group refinements to the Intrado PSAP Registry.

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<sup>38</sup> US Census data was used to determine the population in each township and incorporated area. PSAP populations were determined based on their specific jurisdiction. County or unincorporated populations not served by township PSAPs were evenly distributed among county- and state-wide PSAPs (e.g., state patrol).



- *Funding as a barrier* (Funding constrained, Funding is a critical barrier): A state is classified as funding constrained if it meets two conditions: 1) funding exists (through appropriations or surcharge collections tagged for wireless E9-1-1 use) to cover a PSAP’s estimated capital and operational expenditures (excluding staffing) for a “valid wireless E9-1-1 request”; 2) The state provides for some level of wireless cost recovery<sup>39</sup>. States where funding is a critical barrier are those that have insufficient funds to meet PSAP operating and capital expenditures and / or have no provision for some level of wireless cost recovery. The methodology for obtaining both sets of data is described more thoroughly in section 6.4.
- *State Political will* (high, low): Political will describes two factors: 1) the presence and role of a state coordination office that is responsible for ensuring the successful implementation of Phase II service, and 2) the type of legislative and regulatory environment surrounding 9-1-1 activities (e.g., presence of state surcharge authority, precise statutory language applying funds to Phase I and Phase II upgrades, and a clear legislative mandate for advanced 9-1-1 services). On the former, data was obtained through a rating of states on the extent of state coordination (1=No coordination, 5 = Extensive Coordination) independently verified by NASNA and NENA. On the latter, data was obtained through a January, 2003, evaluation of the relevant state statutes.
- *County Population* (large, small): Variable is used as a proxy for a PSAPs’ local / county political environment and the unique deployment challenges facing more rural communities. PSAPs that are part of counties with populations of less than 25,000 were classified as “small.” Data for county population was obtained through the U.S. Census.

A fifth descriptor reflecting *call volume* was also strongly considered. Subsequent interviews during NENA SWAT meetings indicated that this variable, while interesting, did not significantly impact PSAP behavior and was therefore removed.

### PSAP Archetype Map

	Funding Constrained				Funding Is a Critical Barrier					
	High Political Will		Low Political Will		High Political Will		Low Political Will			
	Large County Size	Small County Size	Large County Size	Small County Size	Large County Size	Small County Size	Large County Size	Small County Size		
Wireless Phase II	<b>1. Continuous Improvers: 17% (1,121 PSAPs)</b>									
Wireless Phase I	<b>2. Knowledge Seekers</b> 36% (2,410 PSAPs)		<b>3. Hurdle Jumpers</b> 11% 726 PSAPs		<b>4. Complacent Providers</b> 3% 215 PSAPs		<b>5. Funding Obstructed Knowledge Seekers</b> 3% (177 PSAPs)		<b>6. Slow Movers</b> 26% (1,765 PSAPs)	
Wireline Enhanced										
Basic	<b>7. Open Territory</b> 5% (333 PSAPs)									
Greenfield										

Source: Intrado PSAP Registry, U.S. Census, August 2003 FCC Filings, State PSAP Lists, NENA DOT Database, Monitor Analysis

Interviews were conducted with PSAPs in all areas of the map to determine areas of similar behaviors and create archetypes. Each archetype was constructed such that member PSAPs share common motivators and barriers.

The seven PSAP archetypes encompass the array of PSAP situations in the current environment. Monitor Group based quantification of the archetype map on an array of quantitative and qualitative data. First, PSAPs were classified according to their 9-1-1 status, as described at the beginning of this section. At this time, all Phase II PSAPs were classified “Continuous Improvers” and each county with only a Basic PSAP or no 9-1-1 provision

<sup>39</sup> Several stakeholders interviewed expressed the opinion that funding as a barrier should consider full cost recovery for all stakeholders, however, current FCC requirements allow PSAPs to upgrade regardless of carrier cost recovery. Recognizing that the absence of cost recovery significantly affects the ability of a PSAP to effectively coordinate a Phase I / II upgrade, the archetype map requires some cost recovery provision to establish “funding constrained”, but does not account for all carrier costs.

was assigned one “Open Territory” PSAP placeholder. Remaining PSAPs were then distributed among the remaining archetypes based on an evaluation of state data, informed by interviews with state coordinators and other members of the public safety community, as well as by secondary research.

## 6.4 PSAP Deployment Timelines Methodology and Analysis

Monitor Group has constructed the PSAP deployment timelines discussed in this document using information available for each PSAP. A rigorous methodology was developed in order to build on the varying degrees of available knowledge about PSAP deployment. PSAPs were placed into one of four groups, with a unique method of calculating deployment timelines for each group. The timelines for each group were then aggregated to reflect a national deployment timeline. Additionally, upper bound and lower bound scenarios were developed. The following is an introduction to the four PSAP groups, three scenarios, and associated assumptions.

### Description of PSAP Groups

*Group 1: Case Study States* — Monitor Group conducted in-depth analysis of selected states in order to extrapolate various assumptions to apply to other similarly behaving states as denoted by their archetype segments. Fourteen percent of PSAPs (907 total) reside in the selected case study states. As part of the state case study analysis, a Phase II deployment timeline was developed for each state, with every PSAP being assigned a deployment date. Whenever possible, this timeline was then vetted with the state coordinator (or other relevant official) and refined accordingly.

*Group 2: PSAPs that Are Currently Phase II* — PSAPs in this Group (exclusive of the state case study states) included those appearing in the August 2003 FCC carrier filings as having already deployed Phase II. Fifteen percent of PSAPs (1,000 total) belong to this group. All PSAPs in this Group were automatically assigned a deployment date of 2003.

*Group 3: PSAPs with Phase II Projected / Request Dates* — These PSAPs have not yet deployed Phase II, nor located in the four case study states. They have a request date or projected deployment date for Phase II listed in the August, 2003 carrier filings. 631, or 9%, of total PSAPs fall into this Group. PSAPs with a projection date for Phase II were assigned the year of that projection date.<sup>40</sup> The majority of these PSAPs are slated for deployment in 2003 and 2004. Based on the below assumptions and learning from the state case studies, Monitor Group then calculated a deployment date for PSAPs with Phase II request dates but no projected date. A total of 121 PSAPs (<2% of total) have a Phase II request date but no projected date.

*Group 4: PSAPs with Current Status Listing But No Phase II Projected or Request Dates* — All 4,209 remaining PSAPs or 62% of all PSAPs — fall into this Group. The deployment timeline was projected based on known barriers to deployment (resulting in a specific archetype designation) and related estimations of the deployment pace, based on those barriers and extrapolated learning from state case studies and other interviews.

### Description of Scenarios

These scenarios primarily affect the rate of deployment for PSAPs in Group 4:

**Base Case** — Represents the most likely deployment timeline given status quo conditions in the state and local environment. Assumptions were developed for each archetype.

**Lower Bound** — Models increased risk to continuing deployment efforts given changes in state and local environment (e.g., worsening state budget crisis, 9-1-1 fund raiding, and decline in the cooperation between PSAPs, WSPs, and SSPs). Assumptions were developed for each archetype.

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<sup>40</sup> In certain instances Monitor Group obtained information that drove the assigned deployment date, rather than carrier filings. For example, conversations with the New Jersey state coordinator revealed that PSAP was not able to utilize Phase II data until 2004. Carrier reports of 2003 deployment date was revised to 2004.

Upper Bound — Represents most optimistic scenario. It is based primarily on carrier projections for Phase II deployment through the end of 2003 and is modeled independently of the PSAP groupings. The deployment rate for the base case through 2010 was applied to the higher starting base of the 2003 carrier estimated deployment.

### **Description of Scenario Assumptions**

*Group 1: State Case Study States* — The projected deployment dates reflect an already conservative view based on state coordinator interviews. In the lower bound scenario, PSAPs in large counties are estimated to deploy one year later than the original projected date, while PSAPs in smaller counties are estimated to deploy two years later than the original projected date.

*Group 2: PSAPs that are currently Phase II* — In the Base Case and Lower Bound scenarios, the number of current Phase II capable PSAPs was adjusted downward by approximately 15% in 2003 and 7.5% in 2004. A sampling of Phase II PSAPs revealed that some PSAPs are not able to process Phase II data at this point for the following reasons: a) WSPs may have deployed Phase II technology to PSAPs, but PSAPs are not always able to process / interpret Phase II data due to pending equipment and / or LEC upgrades; b) Expected timing to resolve above PSAP issues depends on the ability of PSAPs to secure the needed equipment from the vendor; a small percentage of PSAPs may simply lack the funds necessary to purchase the equipment at this point; c) Non-uniform PSAP naming conventions may lead to duplicate PSAPs or double counting in carrier filings. Monitor Group assumes that by 2005, all PSAPs currently marked as Phase II will be fully utilizing their Phase II capabilities. The “Upper Bound” scenario does not receive a downward adjustment, as it represents the ‘best case’ scenario.

*Group 3: PSAPs with Phase II Projected / Request Dates* — The deployment date for PSAPs in this Group is calculated according to available Phase II request and projection dates. In one state, state coordinator feedback indicates that a large area deployment projected to occur in Q4 2003 will not actually be completed until 2004. In addition, the number of PSAPs projected to deploy Phase II in 2003 is adjusted downward in 2003 and 2004 in the same manner as those PSAPs in Group 2. PSAPs with Phase II projected dates assumed this deployment date in the model. PSAPs that had a request date but no projection date were assigned a projected date based on the request date and PSAP characteristics. The following assumptions indicated an additional period of time from the initial request date needed to reach Phase II:

Phase I PSAPs in large / small counties: 6 months / 2 years

Wireline PSAPs in large / small counties: 1 year / 3 years

Basic PSAPs in large counties: 3 years

The above assumptions have been extrapolated from the state case study learning and informed through conversations with various state coordinators throughout this project. Assumptions have been developed around two determining factors: 1) County Size of PSAPs: PSAPs in large counties are expected to deploy significantly quicker than those in small counties (<25,000 people). Large counties generally have stronger political will than smaller counties, may face less complex technical deployment challenges, and can take advantage of a generally larger 9-1-1 surcharge revenue base to more quickly fund needed upgrades. 2) Current PSAP deployment status: More advanced PSAPs are expected to deploy Phase II faster. PSAPs that have already deployed Phase I are familiar with wireless E9-1-1 — and, potentially, the process and technical requirements for requesting upgrades. These PSAPs are likely to be more aware of and educated on the importance of wireless E9-1-1. Additionally, mapping — the most significant barrier for basic PSAPs — has been completed. Anecdotes suggest that mapping in large counties may take ~2 years to complete.

*Group 4: PSAPs with Current Status Listing But No Phase II Projected or Request Dates* — Monitor Group evaluated the current barriers facing PSAPs in each archetype and the factors that may motivate / prompt Phase II upgrades. This analysis informed deployment timelines for each archetype, which rolled up to the deployment timeline for the entire Group. The “Base Case” and “Lower Bound” scenarios have the following deployment rates for each archetype. No additional PSAPs are assumed to be deployed in 2003, as these projections have been previously included in Group 3 PSAPs.

**Knowledge Seekers Deployment Assumptions**

1,191 PSAPs	2003	2004	2005	2006	2007	2008	2009	2010
<b>Base Case</b>	0%	25%	40%	55%	75%	90%	97%	99%
<b>Lower Bound</b>	0%	15%	30%	45%	65%	80%	87%	89%

Knowledge Seeker PSAPs have the fastest deployment schedule, due to sufficient funding and strong state political will. These PSAPs tend to make “valid requests” to WSPs and are effective in orchestrating deployment within the six-month timeframe. It is conceivable that ~250 PSAPs will make valid requests within the latter half of 2003 and early half of 2004 to achieve the 2004 deployment assumptions. In the lower bound scenario, a minor 10% reduction in the deployment rate is assumed, as Knowledge Seekers are motivated and thus least likely to experience delays.

**Hurdle Jumpers Deployment Assumptions**

617 PSAPs	2003	2004	2005	2006	2007	2008	2009	2010
<b>Base Case</b>	0%	15%	30%	45%	60%	70%	85%	90%
<b>Lower Bound</b>	0%	5%	15%	30%	45%	60%	65%	70%

Hurdle Jumper PSAPs are expected to make steady progress toward Phase II deployment, though at a slightly slower pace than Knowledge Seekers, due to the weaker political will in Hurdle Jumper states. The “Base Case” posits that more than half of Hurdle Jumper PSAPs will upgrade to Phase II by 2007, and 70% by 2008. Continued lack of sufficient coordination and specificity in legislative mandate may slow progress, resulting in the lower-bound scenario of a half-year delay in 2004 and a full year thereafter until 2009, when deployment will tail off slightly.

**Complacent Providers Deployment Assumptions**

191 PSAPs	2003	2004	2005	2006	2007	2008	2009	2010
<b>Base Case</b>	0%	10%	20%	30%	45%	60%	70%	75%
<b>Lower Bound</b>	0%	0%	10%	20%	30%	45%	50%	55%

Complacent Provider PSAPs are hampered by both weak state political will and deployment challenges experienced by smaller communities (e.g., technical issues, awareness of importance of E9-1-1). However, once state coordinators and members of the public safety community establish momentum upgrading other PSAPs, they will turn their attention to Complacent Provider PSAPs. Thus, in the most likely scenario, a somewhat slower start leads to steady progress beginning in 2007. A possibility exists that many Complacent Provider PSAPs would be reluctant to expend the fiscal and human resources required to upgrade, resulting in deployment delays of one year in the “Lower Bound” scenario until 2009, at which point deployment tails off.

**Funding Obstructed Knowledge Seekers Deployment Assumptions**

283 PSAPs	2003	2004	2005	2006	2007	2008	2009	2010
<b>Base Case</b>	0%	13%	22%	40%	55%	65%	80%	85%
<b>Lower Bound</b>	0%	0%	13%	22%	40%	45%	55%	60%

Funding Obstructed Knowledge Seekers should deploy at a faster pace than Complacent Providers, due to the presence of state political will. However, Funding Obstructed Knowledge Seekers will continue to be delayed by inadequate PSAP funding or difficulties coordinating upgrade activities in the absence of cost recovery. In the most likely scenario, a small number of Funding Obstructed Knowledge Seeker PSAPs will achieve Phase II status by 2004, followed by consistent progress of 10%–15% annually as money is slowly accrued by states and counties. “Lower Bound” scenario reflects the possibility that funding situations may worsen, resulting in a deployment delay of 1 year from the “Base Case” until deployment tails off beginning in 2009.

#### Slow Movers Deployment Assumptions

1,661 PSAPs	2003	2004	2005	2006	2007	2008	2009	2010
<b>Base Case</b>	0%	5%	10%	20%	35%	40%	45%	45%
<b>Lower Bound</b>	0%	0%	0%	5%	10%	15%	15%	15%

Slow Mover PSAPs have insufficient funds to make PSAP upgrades, lack state coordination to aggressively pursue implementation, and may be located in rural areas with greater technical challenges of implementation. Therefore, Slow Movers are likely to be the slowest archetype to fully deploy Phase II (aside from Open Territory). The “Base Case” posits a slow start in 2004, with annualized increases of around 10%. By 2010, less than half of Slow Movers are projected to have upgraded. The “Lower Bound” scenario reflects the possibility of continued funding gaps and lack of political will, even in later years after most other PSAPs have upgraded. Because any change from the status quo will likely most severely affect this PSAP population, this scenario assumes a two-year delay from the projections in the “Base Case,” with only about 15% of total Slow Movers deploying.

#### Open Territory Deployment Assumptions

264 PSAPs	2003	2004	2005	2006	2007	2008	2009	2010
<b>Base Case</b>	0%	0%	5%	10%	20%	35%	40%	40%
<b>Lower Bound</b>	0%	0%	0%	0%	5%	10%	10%	10%

Open Territory PSAPs are difficult to project, as localities have yet to make any movement toward enhanced 9-1-1, either wireline or wireless. Many of these potential PSAPs are located in wild, open spaces or extremely rural areas; they are expected to eventually begin deployment, but potentially only after other PSAPs have been deployed. Without mandates, some may be reluctant to deploy at all. Thus, Open Territory is not projected to reach 50% deployment by 2010 in the “Base Case.” “Lower Bound” presents a starker case, with a two-year delay from the “Base Case” and deployment peaking at 10%.

#### *Estimating Population Covered*

Many of the parties directly involved in delivery of E9-1-1 interviewed have expressed a belief that population coverage will generally exceed the percentage of PSAPs with Phase II service, regardless of the pace of deployment. This belief is consistent with the existing discrepancy between population and geographic coverage of Phase II implementation, as well as with the beliefs that PSAPs in more populous counties are likely to deploy first. In order to model this belief, Monitor Group developed the following methodology.

Each PSAP in Groups 1–3 has been assigned a unique population. Thus, to calculate population, it has been necessary only to sum the population covered by each PSAP. However, to accurately estimate the population

covered by PSAPs in Group 4 (in which only a certain percentage deploy each year, but not any one specific PSAP), a more rigorous method is required.

The rollout of wireline E9-1-1 spanned a much longer time period than the proposed Phase II timeline, so it was not considered a fair proxy to estimate the population covered during Phase II deployment. However, Phase II deployment has begun only recently, primarily in larger municipalities. Going forward, data on average population of Phase II deployment areas cannot accurately project future population coverage, due to the expectation that smaller and medium-sized municipalities will be deploying next. A proxy for population coverage is therefore required. To construct an estimate of the population covered under the Group 4 deployment timelines, the average sizes of existing Continuous Improver PSAPs and Open Territory PSAPs / counties have been calculated. Existing Phase I PSAPs in Group 4 were then calculated and used as a proxy for “first mover” PSAPs of the remaining archetypes. The resulting “average” size of the first third of PSAPs to upgrade was thereby established at approximately 39,300 citizens per PSAP; the trailing two-thirds of PSAPs to upgrade were assumed to serve approximately 33,100 citizens each, the average size of wireline (or “second mover”) PSAPs in Group 4.

### *Aggregated PSAP Deployment Timelines*

The aggregate of the PSAP deployment timelines produces the timeline shown in Section 6.1. In summary, 49% of all PSAPs are expected to be Phase II capable in 2005, with 62% of the population covered. Deployment is still projected to be below 70% of PSAPs at year-end 2007.

## 7 Wireless Carrier Deployment Timeline Considerations

### 7.1 Overview

Wireless service providers are currently subject to deployment timeline requirements dependent on their chosen technology solution. For carriers that have chosen a network-based solution, many of them are bound by individually negotiated consent decree agreements. These consent decrees specify near-term cell-site targets, but no final target for “total number of cell sites”. Carriers that have chosen a handset-based solution are faced with two sets of requirements: New handset activation requirements, and final 2005 handset penetration targets.

Some carriers have expressed confidence in their ability to meet deployment targets; however, the 2005 deadline for 95% penetration of location-enabled handsets, in particular, potentially represents a significant exposure. Handset players are highly subject to the degree to which consumer demand drives replacement of handsets. As industry growth has slowed and carriers have begun to focus on improving retention, churn has been reduced and natural handset replacement cycles have been extended. While new factors such as LNP will come into play, Monitor Group’s preliminary analysis of the current trajectory of handset replacement suggests that a 95% Phase II penetration across the industry as a whole might only be met by mid-2007 under natural, voluntary consumer replacement. Thus, there is a significant public policy implication: Strict enforcement of handset-penetration mandates would likely result in the unintended consequence of forcing consumers who have not already voluntarily upgraded their handsets to surrender their legacy handsets, which would be a net disservice to public safety and policy goals<sup>41</sup>, and create a potential for consumer backlash in areas where PSAPs have not deployed. This also has the potential to complicate WSP cost recovery issues. Also, since different WSPs have different customer churn and handset replacement profiles, those providers with significantly lower churn relative to their competitors may be differentially penalized due to higher potential liabilities associated with forced handset replacement.

The balance of this section provides an analysis of WSP handset deployment rates, and relevant analogies related to the question of forced handset replacement.

### 7.2 Projected Handset WSP Deployment Rates and Relevant Analogies

While different players have different customer churn and handset replacement profiles, on average handsets are now being replaced once every 3 years, but with a fairly wide distribution in tenure. Based on a preliminary analysis of alternative timelines for handset players, and assuming current run rates<sup>42</sup>, a 95% penetration rate across all players might only be met by mid-2007 under natural replacement. This analysis assumes 100% availability of location-enabled handsets by July 2003.

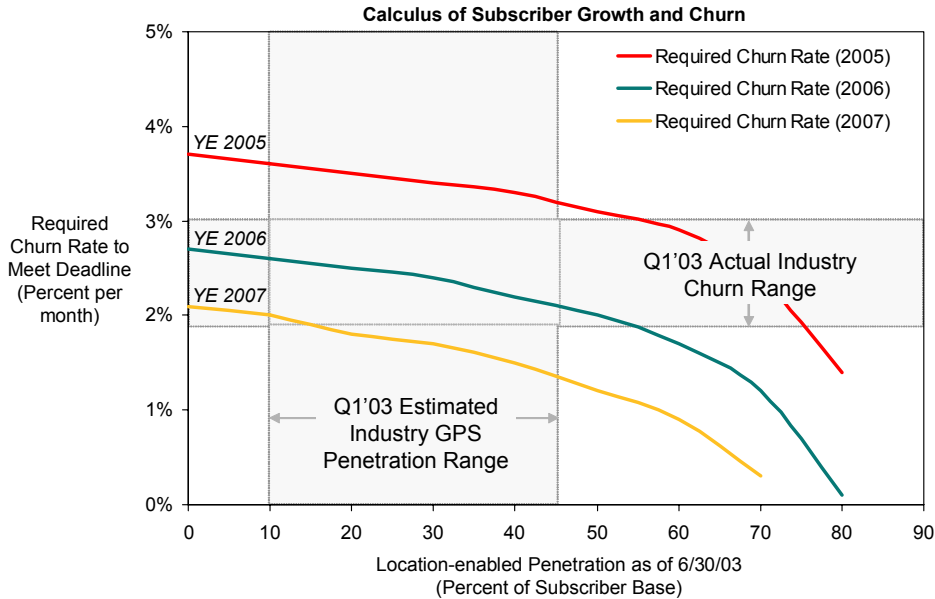
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<sup>41</sup> There is also an associated risk that for some customers, particularly those that provide the lowest economic value to providers, WSPs may be forced to choose between a forced handset replacement and terminating coverage to those consumers.

<sup>42</sup> The following data would be required to fully and precisely estimate the collective financial exposure of handset – based players to forced upgrades relative to the 2005 timeline: (i) projected churn rates, (ii) projected voluntary upgrade rate, and (iii) estimated cost of least expensive replacement handset at year – end. The analysis above assumes current run rates for the first two of these variables.

## Handset Replacement Analysis

### Handset-Based WSP Timeline Implications



Note: Assumes 1% voluntary upgrade rate, industry growth of 0.25% incremental penetration per month, and 100% GPS penetration of new handset sales beyond July of 2003

As noted earlier, a potential implication of the current FCC regulations is a forced replacement regulation imposed upon consumers. A review of regulatory analogies demonstrates that in the great preponderance of instances, the federal government does not require businesses or consumers to replace or retrofit products or goods. Additionally, while there are examples of government requiring retrofitting or replacement, these have generally been directed at businesses themselves, and have been carried out at the state or local level.

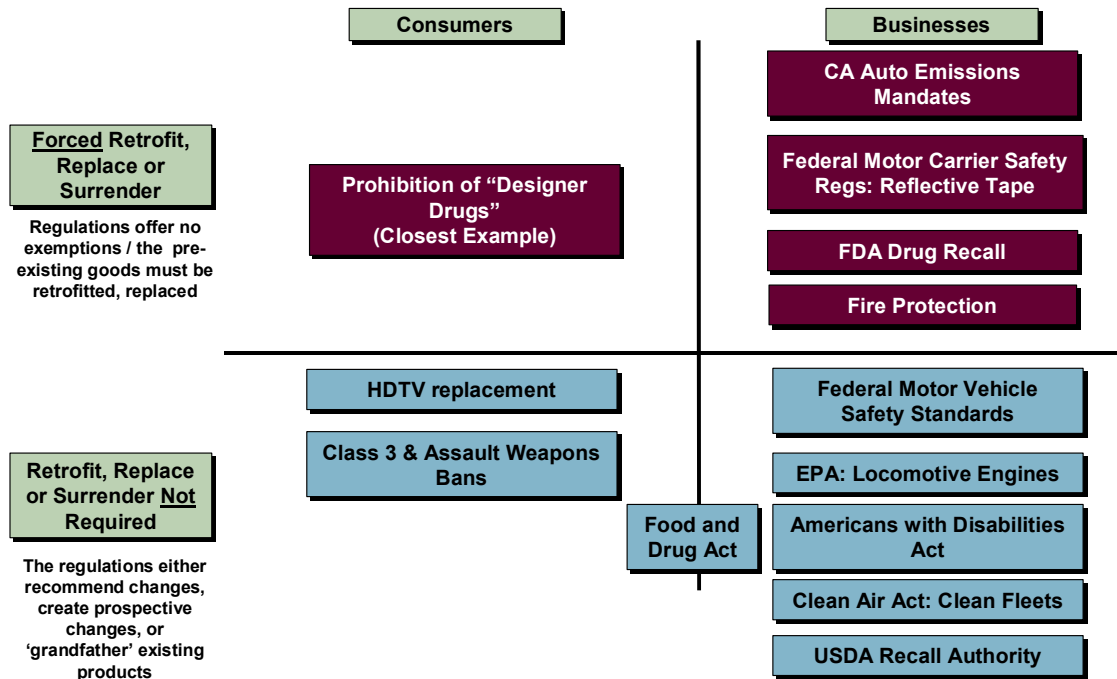
Requiring consumers to replace handsets also seems to contradict a history of regulatory preference for grandfathering existing products — particularly consumer products. Even in cases concerning compelling public health or safety benefits (e.g., ownership of machine guns prohibited, but weapons legally possessed before the ruling are ‘grandfathered’ and still legal for possession and sale), there are few examples of forced replacement / retrofit aimed at consumers.

The relevant analogies can be grouped according to two characteristics: The target of the replacement / retrofit (i.e., who must comply with the rule), and whether the replacement / retrofit is suggested or mandated. The following analogies attempt to explain the precedents around regulatory accountability when standards or regulations are directed at products already being used by individual consumers.



## Analogy Framework

*There are several analogies in which consumers or business are asked to replace/retrofit existing infrastructure or businesses are required to do so; however, there are few examples of consumers being required to replace/retrofit*



### *Analogies: Examples Where Retrofit, Replace or Surrender Is Not Required*

There are a number of examples outlined below in which regulations mandated that business change *future* products or retrofit existing products only during substantial overhauls (e.g., ADA requirements), but grandfathered existing products and infrastructure and did not *force* business to retrofit or replace.

## Examples Where Retrofit, Replace or Surrender Is Not Required

Consumers	Recall/ Retrofit Requirements
Food and Drug Act	<ul style="list-style-type: none"> <li>Consumer Product Safety Commission recalls products that present a significant risk to consumers, e.g., law passed in 1938 after product using diethylene glycol killed 40 people</li> </ul>
Class 3 & Assault Weapons Bans	<ul style="list-style-type: none"> <li>Ownership of machine guns is prohibited, but weapons legally possessed before the federal circuit court ruling are 'grandfathered' and still legal for possession and sale</li> </ul>
Business	
Food and Drug Act	<ul style="list-style-type: none"> <li>In 1938 Congress required that a product be safe before distribution in interstate commerce; Any product on the market prior to 1938 could continue to be marketed unless challenged by the FDA, e.g., drugs marketed prior to 1938 did not have to be shown to be effective and safe</li> </ul>
USDA Recall Authority	<ul style="list-style-type: none"> <li>The US Secretary of Agriculture does not have authority to issue mandatory recalls of tainted meat or poultry products; The USDA and processors share responsibilities for "voluntary" recall, e.g. recall after outbreak of listeriosis in 2002 not initiated until months later, after eight deaths</li> </ul>
Clean Air Act: Clean Fleets	<ul style="list-style-type: none"> <li>By 1998, 30% of <u>new vehicles</u> purchased by centrally-fueled fleets in certain cities will be required to use clean fuels and meet tailpipe standards that are lower than those in place for general passenger cars (0.075 gpm hydrocarbons, 3.4 gpm carbon monoxide, and 0.2 gram per mile nitrogen oxides). The purchase requirement grew to 70% in year 2000.</li> </ul>
Americans with Disabilities Act	<ul style="list-style-type: none"> <li>All <u>newly constructed</u> business buildings or facilities with permits certified as of January 26, 1992 must be readily accessible to and usable for individuals with disabilities</li> <li>All <u>existing business</u> building or facilities altered after January 26, 1992 (e.g., remodeled, renovated) must meet accessibility requirements</li> </ul>
EPA: Locomotive Engines	<ul style="list-style-type: none"> <li>By order of EPA, emission standards for nitrogen oxides, hydrocarbons, carbon monoxide, particulate matter and smoke for <u>newly manufactured and re-manufactured</u> as of 1999 diesel-powered locomotives and locomotive engines</li> </ul>
Federal Motor Vehicle Safety Standards	<ul style="list-style-type: none"> <li>All <u>new passenger cars</u> as of 1968 model year must be equipped with safety belts</li> <li>All <u>new passengers cars</u> as of 1998 must have air bags; all light trucks by 1999</li> </ul>

Regulators generally eschew mandatory retrofitting and allow grandfathering for a number of reasons:

- The cost of retrofitting places a **high cost burden on consumers and manufacturers**. The cost of retrofitting is often higher than the cost of incorporating new standards into future activities. The American with Disabilities Act took this consideration into account by requiring that existing facilities meet less strict access standards than those applying for new construction, because accessibility could be incorporated into new construction without significant increases in cost.
- Mandated retrofitting **threatens the established interests of businesses and consumers** and interferes with free-market activity and decisions. Businesses and individuals have no way of making rational investment decisions based on retroactive future standards.
- When a consumer or business sells (or purchases or builds) a building or manufactures a product **in good faith of existing regulations**, he or it should not be punished because of future retroactive regulation.
- A business may **no longer be in possession of a good it sold or manufactured**. The consumer who has assumed ownership of the product at the point of purchase can voluntarily pay to retrofit a good or product or pay for the replacement costs to gain the benefit of the new regulations.

The predisposition towards grandfathering — i.e., *not* forcing retrofit or replacement by consumers — appears strong. Even in cases with compelling public safety arguments, forced replacement / retrofit for consumers is rare. For example:

- In 1938 Congress required that a product be shown to be safe before it could be distributed in interstate commerce. However, any product on the market prior to 1938 could continue to be marketed unless challenged by the FDA
- Under 18 USC Sec. 922, ownership of machine guns is prohibited, but weapons legally possessed before the federal circuit court ruling are 'grandfathered' and still legal for possession and sale
- The U.S. Secretary of Agriculture does not have authority to issue mandatory recalls of tainted meat or poultry products; The USDA and processors share responsibilities for "voluntary" recall

## Analogies: Examples Where Retrofitting / Mandatory Replacement Is Required

While there is a historical precedent in favor of “grandfather exemptions” from retrofitting requirements, there are some exceptions to this rule:

### Examples of Where Retrofit, Replace or Surrender Is Required

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Consumers	Recall / Retrofit Requirements
<b>Prohibition of Designer Drugs</b>	<ul style="list-style-type: none"><li>• Until the 1986 Controlled Substances Act, it was legal to possess “designer drugs” — drugs almost, identical to previously banned substances (e.g. amphetamine was already illegal, but derivatives were not). The CSA made possession illegal and thereby legislated “surrender” of existing product</li></ul>
<b>Business</b>	
<b>CA Auto Emissions Mandates</b>	<ul style="list-style-type: none"><li>• While federal emission mandates apply to only new engines, California has mandated that by the end of 2006 <u>all diesel engines in operation</u> be retrofitted with diesel particulate filters. Public fleets and operating buses are required to meet these retrofit rules by 2003</li></ul>
<b>FDA Drug Recall</b>	<ul style="list-style-type: none"><li>• Although medical device recalls are usually conducted voluntarily by the manufacturer, in rare instances, where the manufacturer or importer fails to voluntarily recall a device that is a risk to health, the FDA may issue a recall order to the manufacturer; however, individual consumers are not subject to the recall</li></ul>
<b>Fire Protection</b>	<ul style="list-style-type: none"><li>• A number of cities and states have made significant efforts to upgrade fire protection in existing buildings through the mandatory retrofit of automatic sprinkler systems<ul style="list-style-type: none"><li>– The City of Tucson, Arizona successfully passed an ordinance requiring retrofit of all high-rise buildings greater than 50 ft. in height. Buildings were given a 3 year time frame to comply</li><li>– In 1986, the Commonwealth of Massachusetts required that sprinkler systems be installed in all buildings over 70 ft in height and built prior to 1975 (the date from which all new high-rise buildings were required to be fully covered by sprinklers)</li></ul></li></ul>
<b>Federal Motor Carrier Safety Regs: Reflective Tape</b>	<ul style="list-style-type: none"><li>• The FHWA amended FMCSRs to require that motor carriers install retro reflective tape or reflex reflectors within two years of the final date of this rule</li></ul>

When grandfathering is disallowed, it is often under these two circumstances:

- First, it is often done on a **state or local level, not on a federal level**. For example, California has issued a number of retroactive emissions standards, even when federal requirements do not mandate retrofitting. Similarly, the city of Tucson, Arizona, required retrofitting of sprinkler systems in high-rise buildings and gave three years for individuals to comply.
- Second, these requirements are often **directed at businesses or governments assets, not at consumer products or goods**. For example, California’s diesel engine requirements are directed at business and government vehicle owners. Government vehicles were required to comply before all other vehicles.

Forced handset requirements do not meet either of these criteria. FCC requirements are federal requirements, and consumers will ultimately be forced to replace or retrofit their products.

It appears that there are few if any accepted paradigms for adopting regulations that force consumers to surrender or retrofit (as opposed to a test that compares the burden to the consumer versus the benefit to the public, an approximation of the historical theme for regulations forcing businesses to retrofit or surrender). This lack of historical examples similar to forced replacement / retrofit by consumers may, in its own right, imply the lack of appropriateness of such an action. However, the lack of examples also poses the opposite challenge of determining definitively the likely social impact of forced handset replacement.

## 8 Rural Requirements

### 8.1 Overview

Some carriers serving rural areas face considerable obstacles in meeting current accuracy and deployment timeline requirements (e.g., unique topological challenges leading to network configurations not conducive to network based solutions, lack of technology solutions for analog systems prevalent in rural areas, and lack of a large subscriber base across which a carrier can amortize its capital investment or obtain sufficient purchasing efficiencies). Truly rural areas also face a difficult choice between network build-out for more ubiquitous wireless coverage versus financing E9-1-1 upgrades for existing coverage areas. From a policy perspective, this is an extremely complex choice: Should citizens be enabled to make a basic 9-1-1 call anywhere, or do should they be limited as to where they can reach 9-1-1, but ensure that it includes enhanced functionality?

The discussion below provides a summary of the challenges that must be addressed and provides a “starter list” of alternatives for consideration.

### 8.2 Rural Requirements Policy Options

Strict enforcement of Phase II accuracy standards and timelines may result in unintended consequences, such as forcing some carriers to retreat from rural communities and / or subjecting them to severe financial strain. WSPs face challenges in implementing Phase II solutions in rural areas for several reasons:

- *Handset solutions* are not available for all technologies (e.g., GSM, TDMA or analog systems), forcing providers using these systems either to opt for a network solution or to undertake the costly venture of overlaying a different technology. Even for handset-capable technologies, handsets may struggle to achieve the needed accuracy in the difficult terrain of some rural environments in which cell sites are often spaced far apart. Provided that both these obstacles are overcome, wireless service providers must still ensure that GPS enabled handsets are deployed to the public, a more difficult challenge in rural areas, where churn levels tend to be low and many residents perceive current analog systems to provide superior coverage to “newer” digital technologies. (Analog systems often do in fact have a longer range for coverage in rural areas, so rural consumers must often choose between better coverage, i.e., analog, and better features, i.e., digital.)
- *Network Phase II solutions* require a somewhat dense, non-linear deployment of cell sites. Unfortunately, the demand for cell sites in rural areas tends to drive a low-density solution configured linearly along major highways. Most carriers pursuing a network solution must supplement their cellular network with additional uneconomic sites or with Angle of Arrival (AOA) technology that can be incompatible with existing towers. Even then, ability to meet accuracy standards is questionable.
- *Rural Carriers* face the additional challenges of low bargaining power with equipment vendors and a limited customer base over which to distribute Phase II deployment costs. Furthermore, non-rural carriers pursuing network solutions may average their accuracy requirements over their entire network; however, rural carriers lack an urban presence to more cheaply bolster their overall accuracy levels.

The list below represents some potential options to address the above challenges. No implied credence or viability should be associated with any of the options on this list. All listed options have pros and cons, and many or all may suffer from unacceptable deficiencies. The list is organized from the least change required to the greatest change required in the current environment:

- *Status Quo* — Current accuracy requirements are maintained throughout the country, with no relief offered for rural areas. While this option maintains the greatest continuity, it does not remedy a situation that may lead to the withdrawal of basic cellular service from some areas.
- *Eliminate Averaging across Urban and Rural Areas* — One significant disparity in the burden that Phase II E9-1-1 places on National and Rural Carriers is created by carriers’ ability to meet accuracy requirements by averaging their performance across their entire serving area. This allows WSPs with a national footprint to implement higher accuracy systems in urban areas (where it is less expensive to

improve accuracy) and lower accuracy systems in rural areas. This is less costly than deploying to the same standard everywhere. Eliminating the averaging condition would increase fairness to Rural Carriers. It would also, however, substantially deviate from current policy and likely substantially increase the overall barriers inhibiting deployment.

- *Selective Relaxation* — This option allows an independent body to weigh the need for location accuracy in a particular jurisdiction against the challenge of deploying. The body could then relax requirements on a case-by-case basis by crafting a customized solution for each jurisdiction or wide region. But this option fails to guarantee WSPs any consistency in response, and also requires substantial administration to coordinate the various geo-specific plans.
- *Uniform Relaxation* — A reduction of the overall requirements of 100m accuracy on 67% of calls and 300m on 95% of calls nation-wide would reduce much of the pressures felt in rural geographies. Alternately, a separate, looser standard could be set for all jurisdictions falling below a particular population density. In either case, this option provides a low-administrative solution to the challenges faced in rural geographies. It also, however, permits a less-effective solution to be developed overall.
- *Create a “Safe Harbor” for Network Carriers Who Deploy at All Cell Sites* — So long as all active towers are upgraded to Phase II, carriers failing to meet accuracy standards will be forgiven. This option alleviates the substantial financial burden of having to deploy new cell towers to meet accuracy standards. It does, however, promote investment in PDE that provides minimal incremental accuracy, as well as permit accuracy levels well below the current acceptable range.
- *WSPs Deploy Only Where Accuracy Can Be Obtained* — Network Carriers investigate their current cell site configuration and implement Phase II only where accuracy standards can be met, given the current cell tower infrastructure. This option ensures that no capital is wasted; however, it permits large territories to provide no location information whatsoever, and offers no model to improve coverage. In fact, this option may discourage network expansion. If expanding an additional tower will make a carrier capable of achieving Phase II service and responsible for all the associated costs, carriers may be disinclined to expand their coverage.
- *Exemption for Network Carriers that Convert to a Handset Solution by 2005* — Some industry players (e.g., the Rural Cellular Association (RCA)) believe that handset solutions are more appropriate to Phase II than network solutions, because handset solutions are more cost-efficient and more consistently provide the desired level of accuracy. Some also posit that many carriers have selected network solutions due to time pressure and a lack of purchasing power to promote the development of appropriate handsets. Thus, if the FCC were to reduce this pressure by exempting from associated penalties companies that switch to a handset solution, a more effective solution may result. As an example, any carrier currently designated as pursuing a network solution could be made exempt from penalties up to a period to be specified, provided that it meets the standards of a handset solution by an agreed-upon timetable, and assuming widespread Phase II compliant handset availability. However, this option is somewhat unfair with regard to the opportunity it provides WSPs that are developing network versus handset Phase II solutions.

## 9 Future Proofing

### 9.1 Overview

The challenge of upgrading the nation's 9-1-1 infrastructure will extend beyond the current Phase II mandate. Numerous emerging end-user devices and commercial network technologies show considerable promise in improving the quality of 9-1-1 services. One of the key challenges to designing an effective E9-1-1 solution is ensuring that it remains relevant as technological options and consumer behaviors evolve, so as to neither preclude nor hamper the innovative new features, services, and devices that are sure to come on-line in the coming years. Additionally, solutions should be firm enough to prevent "free-riding" by new devices and services. Further, today's systems must be carefully planned so as not to construct a legacy infrastructure that will constrain deployment of future E9-1-1 related technologies and services or drive counter productive policy choices. Some of the limitations of today's E9-1-1 infrastructure are already becoming readily apparent, as many devices and network architectures have already advanced beyond today's functioning 9-1-1 system.

Several different bodies today posit E9-1-1 standards, sometimes resulting in a lack of coordination, or even conflicting standards. The resulting strains are particularly apparent in the capacity and information demands placed on the 9-1-1 network itself, which have grown dramatically with the increase in wireless call volume since the system was originally configured. Other future-proofing challenges include how to handle non-traditional devices and services, such as VOIP (voice over Internet protocol) or 9-1-1 calls placed through telematics and PDA devices, as well as addressing new 9-1-1 features such as incorporation of z-coordinates and "reverse 9-1-1." Issues here range from fairly sharing the system's cost burden with these non-traditional players to establishing common technical and operational protocols to protecting subscribers' privacy.

The balance of this section discusses policy considerations for future proofing as well as a potential network evolution path developed by NENA SWAT.

### 9.2 Policy Considerations for Future Proofing

Given the complexity and ongoing nature of the topic, it is likely that at some point in the future, a separate dedicated initiative will be convened on the topic of future proofing. Any such initiative would benefit from consider the following alternatives for its charter:

- *Goals of the Initiative:* Potential objectives may include: 1) Coordination of the development of industry standards by identifying and prioritizing the list of future proofing needs to address. 2) Leading the resolution of these issues by leveraging industry knowledge and ownership of much of the back-end technology, 3) Initiating pilot programs, and 4) Promotion of educational initiatives for PSAPs and other Stakeholders, and 5) Informing the development of supporting policy on equitable cost-sharing and funding mechanisms
- *Degree of Influence for this Future Proofing Body:* Different options exist as to the degree of influence this body should have, ranging from organized lobbying of the government to enact legislation that will standardize more aspects of 9-1-1 to voluntary industry participation and decision-making to efficiently promote industry change. Underlying the formation of this body is the premise that many of the obstacles to Phase II deployment could have been minimized with earlier discussion and coordination between relevant stakeholders. For instance, one example cited is that had the relevant stakeholders agreed on the mechanism for Phase II data transfer at the onset of deployment, public safety could perhaps have ensured that upgrades made to PSAP CPE in the intervening years were Phase II compliant for less cost.
- *Prioritized Issues to Address:* Among the immediate challenges of the proposed multi-constituent body will be to identify which imminent technologies will be incorporated into the 9-1-1 system. These technologies may include telematics services, VoIP, data-only communications devices, WiFi-enabled handsets and provider advances (including wireless upgrades to 3G-WCDMA, wireline upgrades to IP or MPLS, use of edge-based diffserv vs. cloud-based intserv). Subsequently, the body will need to develop a plan, consisting of concrete and actionable recommendations for all interested parties, to smoothly integrate selected technologies into the system. In the absence of any new body, the SWAT Technical

Team has taken the lead in outlining a potential work agenda to cover many of their immediate concerns regarding the 9-1-1 system. Much work on future issues has already been conducted by the NENA Future Path Plan committee and is reflected in the Future Network Evolution Path (see next section below). Outstanding tasks include:

- Establishing protocols XML data standards
- Making choices around evolving system architecture including whether and how to
  - Mate 9-1-1 tandems (true redundancy)
  - Develop a trusted-host network
  - Utilize a standard IP backbone
  - Enable VoIP communication within the network
  - Enable VoIP communication at the PSAP
  - Evolve to an open systems architecture
  - Implement Advance II (the mainstreaming of 9-1-1 to use standard call direction devices in favor of selective routers)
  - Upgrade the LEC network
- Deciding which new devices should access the 9-1-1 system, and developing a method to enable them to do so
- Advocating for the immediate removal of LATA boundary restrictions

### 9.3 Potential Future Network Evolution Path

In an effort to both accelerate adoption of past developments and anticipate future changes, the NENA SWAT Technical Team has developed a potential Future Evolution Path (FEP) for further consideration. Ongoing efforts to fully address future-proofing are centered on three key issues:

- Evolution of the underlying network architecture
- Development of enhanced 9-1-1 functionality (e.g., including the z-coordinate in location data)
- Incorporation of advanced wireless technologies and emerging end-user devices

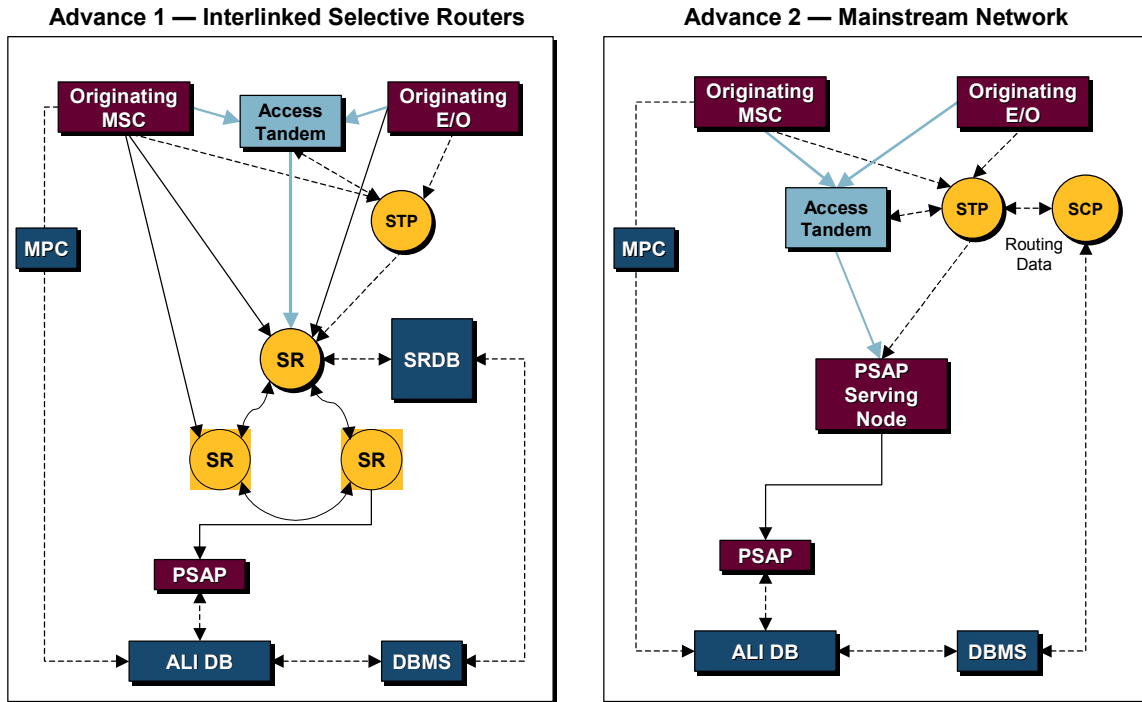
#### *Network Architecture Evolution*

NENA's Future Evolution Path aims to migrate the current 9-1-1 system to one that will be more cost-efficient, robust and capable of accommodating new devices and technologies. This strategy proposes gradually upgrading the existing mixed CAMA and SS7 based network to an entirely SS7 network operating on mainstream components. In the interim, an SS7 based system in which Selective Routers are interlinked would be established.

This system reduces costs and complexity by migrating the 9-1-1 system away from specialized 9-1-1 components. By operating on standard telecom equipment, the 9-1-1 system will benefit from reduced reliance on highly specialized and expensive components and expertise, access to continually upgrading technologies inspired by the broader telecom market, and increased flexibility in system configuration and vendors. The system will also be considerably more robust, as it will have the capability of deferring to the public telephone network, if necessary.

The transition involves a two step process of first interlinking selective routers, then migrating to entirely mainstream technology.





### *Interlinked Selective Routers*

The first proposed step of the migration plan involves interconnecting all Selective Routers (SRs) in a state. The SRs would have to be connected in such a way as to ensure there are two distinct paths between any given pair of SRs (e.g., the SRs are connected in a ring formation). Additionally, an access tandem would enable 9-1-1 calls to reach SRs via the PSTN.

Under this arrangement, 9-1-1 calls from ILEC telephones will be unchanged, passing along direct trunks from the originating End Office via the local SR to the local PSAP. Alternately, the call may be passed from the SSP End Office to the local SR via an access tandem.

The impact will be far greater on wireless calls and calls from CLEC telephones. Under this arrangement, WSPs and CLECs need only connect to two SRs in a state. Emergency calls can then be directed from each of these connecting SRs to any other SR in the state en route to the appropriate PSAP. Therefore, 9-1-1 calls from these telephones will now be directed from the Mobile Switching Center to one of two in-state SRs, and, in turn, onto the particular SR that directly trunks to the appropriate PSAP.

Aside from the implementation simplicity offered to new technologies, this upgrade significantly improves the operation of the 9-1-1 network by:

- Facilitating the transfer of calls between SRs within a state;
- Increasing overall system redundancy;
- Permitting external telecom players (e.g., WSPs and CLECs) to connect to only two SRs per region, thereby reducing overall operating and Phase II implementation costs; and
- Facilitating connection to other public safety entities (e.g., NORAD, the Coast Guard).

In order to achieve these benefits, however, a number of upgrades must be made:

- The network must operate on SS7



- System technology and operational practices must be appropriately evolved to control congestion and default routing (fix 9-1-1 rules)
  - Priority access to lines must be given to 9-1-1 calls
  - Some network circuits must be reserved for 9-1-1 calls
- NENA’s internetworking protocol must be adopted
- The Selective Router Database software must be upgraded to include an entire state
- Certain software obstacles must be overcome to permit reliable use of the public telephone network
- System solutions should be primarily software — rather than hardware-based

Once a given state or region has made these necessary upgrades, it may begin to benefit from the advantages of this configuration. Additionally, it may continue to upgrade to the desirable endpoint of a fully mainstreamed system. In the final analysis, the value of this intermediate step may in part be determined by the length of time it will take to mainstream the network in advance 2 (which would in turn eventually obviate the need for selective routers).

### *Mainstream Technology*

Once the 9-1-1 system is mainstreamed, it will operate entirely on the public switched telephone network. Selective routers are eliminated, and all routing data is provided from the Signal Transfer Point (STP) of the SS7 network. Calls are routed on the public network to a PSAP serving node that, in turn, relays calls to a PSAP via a dedicated trunk. The call transfer methodology is constant, regardless of the calling device used. This method offers a number of significant advantages over simply interconnecting Selective Routers. Foremost, it moves the 9-1-1 system entirely onto mainstream technology, significantly reducing the need for specialized 9-1-1 technology and personnel while enabling 9-1-1 to benefit from innovation in the broader telecom industry. Additionally, this method uses rules-based processing that better manages the level of congestion in the network.

To mainstream 9-1-1, a number of upgrades are required (in addition to those required to interconnect Selective Routers):

- The Database Management System must be upgraded to update network elements (e.g., STP, SCP)
- Trigger software packages are required for each end office or mobile switching center

By adhering to this migration path, the development of the telephone system may greatly improve the quality of service offered by 9-1-1 and facilitate developments in the future.

### *Data Transmission*

The evolution of the call transmission architecture should be accompanied by upgrades of the data network. The FEP envisions the ultimate conversion of all data transmission points in the network to IP compatibility. This upgrade, alongside the use of XML data transmission protocol, will greatly facilitate information-sharing between different sources.

Future Technical Team efforts will focus on:

- Refining and testing the proposed FEP
- Developing guidelines to assist jurisdictions in implementation of the FEP
- Clarifying data transmission protocols and evolution procedures

Feature enhancement currently focuses on the inclusion of the z-coordinate to describe a caller’s location. This can be particularly advantageous in urban settings, where a given x-y coordinate can refer to a location on multiple stories of a building. The FEP facilitates a coordinated approach to the inclusion of this data. By centralizing all data within the ALI databases and by establishing interoperable data transmission protocols, the FEP will provide

a simple solution to this issue: ALI data files that are adapted to incorporate the z-coordinate, and service providers that are mandated to complete the field. Nevertheless, the Technical Team must still decide:

- Whether the proposed solution will adequately meet the needs of all stakeholders;
- Whether to attempt the inclusion of the z-coordinate within the pANI; and
- Whether the proposed infrastructure is sufficiently flexible to accommodate new features of an unknown nature.

The z-coordinate experience illustrates how the proposed architecture's emphasis on interoperability and flexibility will facilitate the accommodation of enhanced functionalities. Importantly, the objective at this point must not be to prescribe a detailed solution, but rather to establish a framework that will be robust with respect to future functionality requirements.

### *Advanced Technology and Emerging Devices*

Similarly, a framework must be developed to incorporate advanced technologies and emerging devices. Specifically, this framework must:

- Assess the viability of the proposed network architecture in accommodating emergent technologies;
- Propose a path forward to facilitate the future incorporation of new technologies; and
- Articulate policy and funding options codifying how compatibility with the 9-1-1 system should be achieved and how cost recovery issues will be addressed.

## 10 Driving Deployment: Policy Leadership and Grassroots Education

As the time of writing, two important pieces of E9-1-1 federal legislation have been introduced. The first, sponsored by Senator Burns and Senator Clinton was introduced on June 12, 2003, passed from committee, and then reported to the full Senate on July 29th, 2003. This bill, S.1250, “The Enhanced 911 Emergency Act of 2003” was approved by the Senate Commerce Committee and now awaits debate on the Senate floor. On July 25, 2003 Representatives Eshoo and Shimkus introduced H. R. 2898 the “E-911 Implementation Act of 2003.” This bill was approved by the House on November 4th, 2003. While differences between the two bills do exist, they advocate a similar and useful approach to advancing E9-1-1 deployment.

Key features of the two bills include the following:

### A. Funding grants for PSAPs

- Authorizes funding for grants to enhance emergency communications services through planning, infrastructure improvements, equipment purchases, and personnel training and acquisition. Makes available fifty percent matching grants to state, local, and tribal governments
  - The Senate Bill authorizes up to \$500 million per year *for* enhancing emergency communications. The grant program would be administered by the NTIA, in consultation with the Department of Homeland Security (DHS).
  - The House Bill authorizes up to \$100 million for each of fiscal years 2004–2008 for Phase II services only. The grant program would be administered jointly by the NTIA and the National Highway Traffic Safety Administration (NHTSA), in consultation with the DHS and the FCC. The House bill further delineates certain requirements for certification of an eligible entity for grants.

### B. A federal coordination body within the NTIA

- Creates NTIA Task Force (Senate bill only) or NTIA and NHTSA Coordination Office (House bill only)
  - Requires the Task Force or Coordination Office to facilitate coordination among federal, state, and local communications systems: Submit reports on E9-1-1 to congress; review, approve, and oversee grant applications (House bill only); and collect and disseminate information on E9-1-1.

### C. Auditing of use of funds

- The Senate bill requires the FCC to review, twice a year, fees for enhancing 9-1-1 services. Both bills require states to certify that E9-1-1 fees are not being used for purposes unrelated to E9-1-1.

### D. Penalties for diversion of E9-1-1 designated funds

- The Senate bill requires the NTIA to withhold two times the diversion in grant funds from states that are found to divert E911 funds.
- The House Bill requires any entity that diverts funds to return all of the funds from the grant to the NTIA

### E. Other Provisions for Performance Requirements

- The House Bill requires the FCC to submit a report on the deployment of E9-1-1 Phase II services by Tier III service providers.

To further advance E9-1-1 deployment, and build from the current proposed legislation, future legislation may contemplate placing additional focus on the following areas:

- Funding and cost recovery, particularly details on criteria for states receiving funds, specification of how monies are spent, including performance and deployment expectations, and provisions for auditing;

- Effective federal and state coordination, particularly details on delineation of roles and authority;
- Ensuring a smooth future path for 9-1-1 in years to come, particularly setting up a framework and process for industry / public safety led addressing of standards and policy for new devices, services and functionality.

In addition to federal legislation, state and grassroots play an important role in E9-1-1 implementation. Below are several example state models and considerations for a grassroots program.

## 10.1 Selected Best Practice Models for State Legislation

9-1-1 is ultimately a state and locally provided public good. For this reason, states and localities play a critical role in the quest for E-9-1-1 ubiquity. With that in mind, below are summarized models of state action that other states may want to draw upon to advance E9-1-1. These *models* illustrate features of state governance that appear to be helpful for effective E9-1-1 implementation, specifically:

- Statewide coordination
- Cascading incentives
- Detailed criteria for PSAP funding and WSP cost recovery
- Protection from fund diversion (i.e., “raiding”)

As different states will require solutions tailored to their specific circumstances, these models are intended only as examples of the types of action that a state may choose to take.

### 1. Critical State Feature: Statewide Coordination

Due to the unique positions of responsibility held by States, State-level coordination and oversight is perhaps the most critical step for timely E9-1-1 deployment. A Monitor Group Study clearly indicates that in many states the presence of empowered State E9-1-1 Coordinators is one critical factor to positively impact a state’s rapid implementation of Phase II technology. (Section 5.2 of this paper, “Coordination and Oversight” discusses in detail the critical need for state leadership and possible model thereof.)

### 2. Critical State Feature: Cascading Incentives

One of the hallmarks of 9-1-1 is its local nature. Just as federal 9-1-1 recommendations require the development of either negative or positive incentives for states to participate, state-driven 9-1-1 initiatives necessitate the development of incentives for local participation.

Tennessee’s recently passed legislation illustrates how such incentives can be structured. The central coordination and oversight body, the Emergency Communications Board, has the ability to withhold 9-1-1 funds from localities that do not comply with the requirements that have been set forth. Because localities depend upon the state funds to operate local PSAPs, Tennessee has achieved excellent compliance. For these types of incentives to work, there needs to be enforcement of the requirements that are set forth — it is not enough for a state to simply set up cascading incentives.

Proposed legislation in Ohio offers another avenue for state governments to ensure the allocation of 9-1-1 resources motivates E9-1-1 deployment. The proposed legislation in effect creates an “opt-in or out” system in which localities are offered 9-1-1 funds if they meet certain requirements critical to E9-1-1 operation (e.g., creating effective deployment plans, possessing or creating plans to create capable PSAPs). If the localities fail to meet these goals in the allotted time or simply choose not to fulfill them (akin to ‘opting-out’), then the state re-routes all 9-1-1 calls from that locality to a neighboring locality that *has* met the state’s requirements. This second locality would also receive the funding previously earmarked for the first locality.

State Model	Legislative Outline
Tennessee	<ul style="list-style-type: none"> <li>• Authorizes state’s Emergency Communications Board to <i>withhold distribution of funds to emergency communications districts if the district is operating in, or fails to correct a specific violation of state law</i> <ul style="list-style-type: none"> <li>– Fails to submit an annual budget or audit</li> <li>– Operates contrary to requirements</li> <li>– Is not taking sufficient action or acting in good faith to establish E9-1-1 service</li> </ul> </li> </ul>

State Model	Legislative Outline
Ohio (Proposed Legislation)	<ul style="list-style-type: none"> <li>• Provides a County with a guaranteed minimum level of PSAP funding for the first three years. The money is placed in escrow until a 9-1-1 Final Plan is adopted or amended as required by state law.</li> <li>• If after three years the County fails to meet the requirements, the 9-1-1 calls could be routed another PSAP or county.</li> <li>• The funds held in escrow would follow the calls and be released to the agency where the 9-1-1 calls are now being routed.</li> </ul>

### 3. Critical State Feature: Specific Criteria for PSAP Funding and WSP Cost Recovery

Given the tight budgetary conditions facing states and localities, as well as the lessons of recent history, standards need to be created to protect against state and local mis-application of 9-1-1 dollars. Many states create detailed lists to identify eligible reimbursable costs for PSAPs and WSPs. States vary in the degree to which they reimburse capital expenditures and operating expenditures to each of these stakeholders.

In Wisconsin, an expert body determines the specific criteria for which wireless providers and localities are reimbursed. By creating lists, Wisconsin establishes clear criteria for eligible costs.

State Model	Legislative Outline
Wisconsin	<ul style="list-style-type: none"> <li>• Requires the Public Service Commission (PSC) to make <i>grants to wireless providers and local governments for reimbursement of certain costs</i> related to providing wireless 9-1-1 service and operating PSAPs <ul style="list-style-type: none"> <li>– <i>Eligible wireless provider costs:</i> Costs incurred or will incur to upgrade, purchase, lease, program, install, test, operate or maintain all data, hardware, and software necessary to comply with FCC orders</li> <li>– <i>Eligible local government costs:</i> Costs directly incurred or will directly incur for the purpose of promoting an effective and efficient E9-1-1 system</li> <li>– <i>Ineligible local government costs:</i> Costs for dispatching emergency services and salaries and benefits for PSAPs</li> <li>– Requires PSC to promulgate <i>rules</i> for making grants and criteria <i>for approving estimated costs</i> and record</li> </ul> </li> </ul>

Indiana’s legislation, like that of many states, lays out specific amounts of the \$0.65 state wireless surcharge to be applied toward various E9-1-1 activities. The funds are placed into various "silos" from which PSAPs and WSPs can receive funds. This helps to ensure that money is being used appropriately.

State Model	Legislative Outline
<b>Indiana</b>	<ul style="list-style-type: none"> <li>• \$0.25 (at minimum) is put into the CMRS silo, to be used for wireless capital expenditures and operating expenditures cost recovery</li> <li>• \$0.355 is placed into a PSAP sub-account, which is distributed to PSAPs based on population, with these funds having to go toward Phase I or II implementation</li> <li>• \$0.015 is specifically for Phase II, with PSAPs and WSPs able to submit receipts for Phase II costs for reimbursement from this fund</li> <li>• The remainder of funds is for administrative costs</li> </ul>

**4. Critical State Feature: Protection from Fund Diversion (“Raiding”)**

In addition to creating clear requirements for eligible reimbursements (above), states should consider a program to verify that these regulations are being followed. Verification mechanisms are critical to ensuring that E9-1-1 dedicated funds are not diverted at a local level. Specific auditing procedures or certification standards would be an obvious verification mechanism.

South Carolina’s code authorizes the Budget and Control Board to retain an independent auditor to verify that the reimbursement of WSP and PSAP expenditures is consistent with the enhanced wireless purpose of FCC Order 94-102.

State Model	Legislative Outline
<b>South Carolina</b>	<ul style="list-style-type: none"> <li>• Budget and Control Board authority includes: <ul style="list-style-type: none"> <li>– Retaining an independent, private auditor, as provided in the Consolidated Procurement Code, for the purposes of receiving, maintaining, and verifying the accuracy of any proprietary information submitted to the board by CMRS providers or PSAPs, and assisting the committee in its duties, including its annual calculation of the average 9-1-1 wireline surcharges and in any cost studies it may conduct. All local government audits are to include 9-1-1 surcharge expenditures and be filed with the State Auditor and Budget and Control Board</li> </ul> </li> </ul>

Although Georgia’s wireline and wireless surcharges are imposed and collected on a local basis, Georgia code is fairly specific on the need to keep the funds in separate accounts for 9-1-1 purposes and the manner in which these monies can be spent. Auditing requirements are specified: 1) at the state level where all localities must have their funds (not 9-1-1 specific) audited annually; and 2) through a pending 9-1-1 related auditing provision that is being championed by the “Association of County Commissioners”. Of particular interest is the OneGeorgia grant program (non-legislative) that is implemented and governed by the OneGeorgia Board (the 9-1-1 state coordination entity).<sup>43</sup> This program includes an extensive outline of enforcement mechanisms for the funds’ intended use.

<sup>43</sup> The non-matching grant program is designed to make 9-1-1 affordable for some of the smaller rural counties. The main stipulation to qualify for a grant is that the applicant(s) must be at least 2 counties one of which has never had a 9-1-1 system. The grants range from \$300,000 to \$700,000.

State Model	OneGeorgia Grant Program Outline (non-legislative)
Georgia	<ul style="list-style-type: none"> <li>• <i>No applicable state laws, rules, regulations, or applicable local ordinances shall be violated</i> in carrying out this project and expending Regional E-9-1-1 Fund monies.</li> <li>• <i>Recipient will adhere to applicable state and local procurement requirements and it will maintain documentation to confirm such adherence.</i> For activities not applicable to state procurement requirements, recipient agrees to procure such services and activities through a fair and open competitive procurement process that is openly advertised through appropriate media and in compliance with any applicable local procurement laws or regulations.</li> <li>• Recipient’s <i>accounting records shall be maintained in a manner consistent with generally accepted government accounting standards.</i></li> <li>• The recipient (in accordance with state law) <i>shall undergo an annual financial audit</i> conducted in accordance with government auditing standards established by the comptroller general of the United States. <i>The recipient shall submit copies of all audits that cover all or part of the award period to the agency.</i></li> <li>• <i>No real or apparent conflict of interest shall be engaged in by any person or party (or any person or party with whom they have family or business ties) who is involved in any aspect of the Regional E-9-1-1 Fund project.</i></li> </ul>

## 10.2 Grassroots and “Grasstops” Education and Awareness-Building

A number of ongoing activities beyond legislation are critical to the success of E9-1-1 deployment. Coordinated and consistent programs for education and awareness-building about the importance and benefits of E9-1-1 will encourage active engagement of all stakeholders and help to drive implementation. To achieve this goal, public safety organizations, industry and 9-1-1 officials must work at the federal, state and local levels to educate and raise awareness among consumers, legislators and public safety officials.

Based on interviews with various state and local public safety representatives, the following outlines potentially helpful methods and examples of education- and awareness-building activities aimed at three key groups: consumers / citizens; federal, local and state officials; and the local public safety community. While it is vital to broadcast a common message about the importance of E9-1-1 to all relevant parties, it is also important to note that each constituent group will benefit from messaging and education tailored to its specific needs and interests.

### *Consumers / Citizens*

Low public awareness of the state of E9-1-1 frequently contributes to low local political will. This lack of awareness often results from both insufficient education and the dynamics of local political institutions. Compounding the problem is the fact that many consumers incorrectly assume that they already have wireless E9-1-1 capabilities in their local area<sup>44</sup>. Thus consumer awareness of the importance of E9-1-1 is critical to capturing the attention and energy of relevant policy makers at the federal, state, or local level. “All politics is local,” as the saying goes; as voters’ realize there is a gap between their expectations of 9-1-1 and the actual system capabilities<sup>45</sup>, they will exert pressure on government officials to close that gap.

<sup>44</sup> Respondents were asked: “When you make a 9-1-1 call from a traditional landline telephone in most parts of the U.S., the person answering the call receives precise information about your location, regardless of whether you know where you are when you call (for example, if you place a call from a hotel or pay telephone). Similar information for calls made from wireless telephones is available using wireless E9-1-1 location technology. Please answer the following questions with this information in mind. What percent of the U.S. do you believe is served by wireless E9-1-1 location technology?” Average response was 55%.

<sup>45</sup> See Monitor Group E9-1-1 Public Views Survey, April 2003 in Section 12.

E9-1-1 has generally not been a pressing public issue, and E9-1-1 grassroots campaigns have not been prevalent. However, several states have used various public-relations resources to raise their citizens' awareness of E9-1-1 issues. In Indiana, for example, the Wireless Enhanced 9-1-1 Advisory Board has partnered with the American Heart Association to develop a website ([www.911coverage.org](http://www.911coverage.org)) that increases awareness of E9-1-1 with such features as background information for consumers and detailed coverage and deployment maps, thus increasing exposure for E9-1-1 issues. The Board also took advantage of the local popularity of the Indianapolis 500 to produce E9-1-1 awareness commercials featuring State Treasurer Tim Berry and popular driver Sam Hornish, Jr. The commercials promoted the website and also urged consumers to push their local carriers to accelerate deployment of Phase II.

The Texas Commission on State Emergency Communications (CSEC) also provides a helpful website for consumers ([www.911.state.tx.us](http://www.911.state.tx.us)) whose offerings include online versions of useful pamphlets such as “Where does my \$0.50 go?” an overview of 9-1-1 funding. Many people may be aware of surcharges on their bills, but unsure as to the use of these funds. A well-crafted public relations campaign could both educate the public and also encourage people to push their local officials for E9-1-1.

### *Federal, State, and Local Officials*

An increase in consumer awareness resulting from public relations campaigns will increase pressure on federal, local and state officials, all of whom constitute a critical audience for continued communications about the value of E9-1-1. However, this pressure must be coupled with active advocacy for E9-1-1. The recent creation of the Congressional E9-1-1 Caucus and its subsequent legislation are an example of how effective communication with officials can produce results for E9-1-1. A consistent and strong E9-1-1 voice in Washington, D.C. (e.g., E9-1-1 Institute, advocacy and educational efforts by public safety organizations such as NENA and APCO) can maintain the current Federal momentum in support of 9-1-1 upgrades.

As federal officials begin to focus more closely on E9-1-1 issues, it becomes increasingly important to simultaneously raise awareness at the state and local level — the level at which E9-1-1 upgrades actually occur. State chapters of public safety organizations can encourage local and state officials to make E9-1-1 a public safety priority. Additionally, states or localities with strong political will can serve as an effective lobby for neighboring states and localities to raise awareness and expel apathy.

### *Public Safety Community*

Public safety officials generally understand the pressing need for E9-1-1 ubiquity. However, a surprising number of officials are uninformed about or uninterested in E9-1-1. Interviews with PSAPs and localities reveal that education is most needed on the importance of wireless E9-1-1, technology issues, deployment processes for wireless E9-1-1, federal and state mandates, and even the availability and source of educational materials. In some localities, even the most basic education would go a long way: Some PSAPs do not understand what E9-1-1 functionality can do, much less what equipment upgrades are needed for Phase I or II.

For example, a visit to a rural county revealed that the local sheriff, who operates the dispatch, was unaware that location technology for wireless phones exists. Informed that such technology is available, he seemed more than willing to pursue implementation. In another example, two counties in Indiana continue to use Basic service, despite the state's leadership and impressive achievements for E9-1-1 overall. The lesson is clear: The incredible heterogeneity of PSAPs, and associated diversity of local public safety officials, ensures that not all public safety officials will understand or prioritize E9-1-1, despite the best efforts of state and federal levels. Thus, educating the local public safety community will remain a significant and ongoing challenge for state and county officials.

Indiana has found that regional seminars for PSAP coordinators and other public safety officials can be an effective teaching tool. Approximately once a year, the Wireless Advisory Board holds several seminars (with each county invited to one). These seminars educate the officials about Phase II deployment and other relevant issues, and give officials the opportunity to seek help. They also help to spur innovation or healthy competition among the state's public safety officials.



## 11 Wireless E9-1-1 Deployment Factor Analysis

Throughout this document, descriptors (or variables) that are anecdotally significant determinants of wireless E9-1-1 deployment have been referred to, particularly to frame various analyses such as the archetype map and the deployment timeline analysis. These descriptors have been uncovered through: 1) discussion with the SWAT participants, state coordinators, and local PSAP coordinators; and 2) secondary research. To better understand the relationship between these variables and Wireless E9-1-1 deployment, and to provide a further quantitative basis for the use of these factors, Monitor Group undertook a multi-variate regression analysis.

### *Purpose of the Multi-variate Regression Analysis*

The purpose of this multi-variate regression analysis was to provide a quantitative basis to explain the relationship between a set of descriptive variables and the Wireless E9-1-1 deployment pace. Monitor Group examined three factors in particular: 1) the **variance** in Wireless E9-1-1 deployment explained by the set of descriptive variables; 2) the **sensitivity** of the relationship (i.e., the direction and magnitude of the relationship) between a particular descriptive variable and the Wireless E9-1-1 deployment pace, and 3) the **strength** of the relationship (i.e., statistical significance) between the descriptive variable and the deployment pace.

The analysis focuses on explaining the variance in deployment pace across states<sup>46</sup> for PSAPs that had achieved Phase I or greater status (i.e., includes Phase II PSAPs) by July, 2003. While Monitor Group did conduct a Phase II-only regression analysis, no conclusive findings could be drawn due to the lower number of PSAPs that have deployed Phase II nationwide.

Please note the following caveat when interpreting the results of this analysis: This regression analysis uses cross-sectional data excerpted in the July, 2003, timeframe. Because no time-series data has been captured, the analysis is not predictive; no causality can be attributed in this analysis. However, the data does indicate that the existence of each condition (e.g., PSAP funding sufficiency, WSP cost recovery, extent of state coordination) is highly correlated with broader deployment of wireless E9-1-1 within each state.

### *Variables Explored in the Multi-variate Regression Analysis*

For each of the 50 states, the analysis explored a number of different descriptive variables and various incarnations of each as described below. The variables include:

- *Funding Variables:* Total annual wireless surcharge collected; percent of PSAP capital expenditures and operating expenditures covered by Wireless E9-1-1 funding; a logarithmic function of the previous variable; the balance of the remaining funds after PSAP capital expenditures and operating expenditures were covered.
  - **Hypothesis:** Sufficient PSAP funding correlates to a higher Phase I / II deployment rate because PSAP readiness in terms of equipment / system upgrades and training is critical to a) making a valid request and b) being able to interpret the WSP / SSP transmitted Phase I and Phase II data once the WSP has deployed.
- *WSP Cost Recovery Variables:* Existence of some level of WSP cost recovery, either as a statutory mandate or as a result of a State Coordination body's interpretation of the statute. This variable is expressed as "Yes" or "No." While there are other variables that apply more directly to the amount of WSP costs reimbursed, this data was not readily available.
  - **Hypothesis:** The existence of some level of WSP cost recovery correlates to a higher Phase I / II deployment rate. WSPs bear \$7 billion out of the total \$8.5 billion in wireless E9-1-1 deployment costs. There are two alternative interpretations for the relationship described by this variable: 1) the variable represents that WSPs have thus far deployed according to their request queue; most of these earlier requests likely originated from states that instituted cost recovery prior to the FCC retraction

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<sup>46</sup> Variable is expressed as number of Phase I and II PSAPs deployed as a percentage of all PSAPs within a particular state.

of mandating cost recovery; or 2) the variable represents a proxy for state political will in terms of initiative in creating conditions that would foster a greater cooperative atmosphere for all Stakeholders.

- *State Coordination Variables:* Extent of state coordination (rated from 1 to 5); presence of a state coordination body (expressed as Yes or No)
  - **Hypothesis:** More robust state coordination body correlates to higher Phase I / II deployment rates due to the need to manage the complex and diverse 9-1-1 deployment environment (e.g., educate PSAPs and local governments on more complex technology, manage increased number of players, secure incremental funding needs, and mediate issues between PSAPs and service providers).
- *History of Fund Raiding Variable:* History of fund raiding in the last 3 years (expressed as Yes or No)
  - **Hypothesis:** Misuse or misappropriation of E9-1-1 funds correlates to a delay in the deployment process because fewer funds are available to PSAPs and system providers for upgrades.
- *Population Variables:* Population density; average county population; percentage of state covered by large counties (large counties defined as greater than 25,000 in population)
  - **Hypothesis:** Less densely populated areas correlate to slower deployment of Phase I/II PSAPs. Less dense areas add another layer of complexity to the deployment process due to unique technical barriers and challenges in raising sufficient funds through the imposition of a reasonable wireless surcharge amounts.
- *Local PSAP Environment Variables:* PSAP managers' skill level; number of local institutions involved in managing PSAPs; local political will (e.g., well informed government)
  - **Hypothesis:** PSAPs are inherently local organizations governed by local institutions. The pace of wireless E9-1-1 deployment may correlate to the degree of politics present in the local environment and local institutions' awareness of the importance of E9-1-1.
- *Macro-environment Variables:* FCC enforcement action; availability of Wireless E9-1-1 technology; WSP financial situation
  - **Hypothesis:** The impact of the macro-environment variables are embedded systematically across all players and all states, and, may be correlated with the pace of Wireless E9-1-1 deployment nationwide.

In selecting the final list of variables for the regression equation, consideration has been given to each variable's statistical significance and its ability to be readily measured on a national basis within the timing and scope of this Initiative. Based on this set of criteria:

- No local PSAP environment variables were selected, due to the difficulty in collecting this data on a national level within the scope and timing of this Initiative
- No macro-environment variables were selected, because of the difficulty in developing a satisfactory proxy within the scope and timing of this Initiative to measure the impact of these variables on an individual state basis
- The final list of variables selected are Logarithmic function of the percent of PSAP capital expenditures and operating expenditures covered by Wireless E9-1-1 Funding, Existence of WSP Cost Recovery, Extent of State Coordination, History of Fund Raiding, and Population Density

Descriptions and sources of data for each variable can be found in the chart below.

## Variables Used In the Analysis: Description and Sources

	Description	Sources
<b>PSAP Funding Sufficiency</b>	<ul style="list-style-type: none"> <li>Percentage of the PSAPs' estimated capex and opex (excluding staffing) covered by available funding over a 5 year period                             <ul style="list-style-type: none"> <li>Expressed as a Logarithmic function due to evidence of a diminishing return to funding</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Funding data verified by state coordinators / funding agencies</li> <li>Cost data generated by NENA SWAT technical team and Monitor analysis</li> </ul>
<b>Existence of WSP Cost Recovery</b>	<ul style="list-style-type: none"> <li>Presence of some level of WSP cost recovery as determined by explicit provisions in the statutes and / or through conversations with state coordination offices                             <ul style="list-style-type: none"> <li>Variable expressed as Yes or No</li> <li>States with no explicit provision in statutes (and unconfirmed with state coordination office) may still provide cost recovery, but tagged as "no WSP cost recovery" here</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>State 9-1-1 statutes</li> <li>Data verified by state coordinator / funding agencies</li> </ul>
<b>Extent of State Coordination</b>	<ul style="list-style-type: none"> <li>Rating of the extent of coordination within each state, as defined by its role in a coordinating body, funding collection and disbursement mechanism, education activities, procurement process and deployment planning (see later appendix slide for further detail)                             <ul style="list-style-type: none"> <li>Rating ranges from 1 (None) to 5 (Extensive)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>State case studies and state statutes</li> <li>Independently verified by NASNA and NENA</li> </ul>
<b>History of Fund Raiding</b>	<ul style="list-style-type: none"> <li>Raiding of funds within the last 3 years. Fund raiding defined as either re-appropriation and / or misuse of stipulated 9-1-1 funds                             <ul style="list-style-type: none"> <li>Variable expressed as Yes or No</li> <li>Documented raiding has occurred in 12 states</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>NENA data</li> <li>Secondary Research</li> </ul>
<b>Population Density</b>	<ul style="list-style-type: none"> <li>A proxy for states with predominately urban vs. rural areas                             <ul style="list-style-type: none"> <li>Variable expressed as persons / sq. mile</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>U.S. Census</li> </ul>

### *Findings of the Multi-variate Regression Analysis*

Taken together, the PSAP Funding Sufficiency, Extent of State Coordination, Existence of WSP Cost Recovery, History of Fund Raiding, and Population Density variables explain 43% of the variance in Wireless E9-1-1 (Phase I and Phase II) deployment nationwide. Monitor Group hypothesizes that the remaining unexplained variance of 56% may be due to the phenomena of local political will, for which an appropriate proxy has yet to be identified. The following chart explains the sensitivities and significance of the variables that explain the variance of E9-1-1 deployment nationwide:

## Summary Results

### Significant Variables Explaining PSAP Deployment (Phase I or better)

5 highly significant factors account for 43% of the variance in PSAP Phase I and II deployment

		Implications for PSAPs with Phase I or Greater Status	Significance Level
Accounts for 43% of Variance	PSAP Funding Sufficiency	<ul style="list-style-type: none"> <li>1% increase of PSAP Capex and Opex cost covered (on a logarithmic scale)*, is associated with a <b>24% deployment increase</b> of PSAPs with Phase I or greater status</li> </ul>	99%
	Extent of State Coordination	<ul style="list-style-type: none"> <li>1 level increase in the extent of state coordination (1=no coordination, 5=strong coordination) is associated with a <b>7% deployment increase</b> (i.e. going from a rating of 1 to 3 is associated with a 14% increase; see Appendix)</li> </ul>	95%
	Existence of WSP Cost Recovery	<ul style="list-style-type: none"> <li>The presence of WSP cost recovery is associated with a <b>17% deployment increase</b></li> </ul>	90%
	History of Fund Raiding	<ul style="list-style-type: none"> <li>A history of fund raiding within the last 3 years is associated with a <b>17% deployment decrease</b></li> </ul>	89%
	Population Density	<ul style="list-style-type: none"> <li>An additional 1,000 persons per square mile is associated with a <b>19% deployment increase</b></li> </ul>	72%

\* PSAP cost covered variable defined as a logarithmic function; i.e. there are diminishing returns of funding to increased deployment

Note: DC PSAPs are not used in the regression because the population density of DC is an outlier that skews the regression; Regression equation:  $y = 0.12 + .24(\text{PSAP fund}) + .17(\text{WSP cost recovery}) + .07(\text{state coordination}) - .17(\text{fund raiding}) + .19(\text{population density})$ ; Fund raiding variable based on 3 year funding

Source: State Interview, State PSAP Lists, NENA DOT, FCC Carrier Filing 8.2003, Monitor Analysis

## 12 E9-1-1 Public Views Research Methodology and Summary Highlights

In order to gain a greater understanding of how 9-1-1 and wireless location technology are implemented, used, and perceived, and to help inform the various discussions of the NENA SWAT Stakeholders' Initiative, Monitor Group designed and fielded an online survey from April 4-April 9, 2003, then collected and analyzed the data. Questions originally asked in 2000 by the Harris Interactive Poll for NENA's Report Card to the Nation (RCN) were also included in the survey, allowing for an update to this important document that provides a longitudinal perspective on public views with respect to 9-1-1. The Monitor Group survey focused on the following topics:

- Familiarity and knowledge of 9-1-1 system
- Experience with, rating of, and confidence in 9-1-1 system
- Relative importance of 9-1-1 system as public safety good
- Relative importance of wireless location technology as public good
- Appropriate funding sources, mechanisms, and amounts for 9-1-1 and wireless location technology
- Uses of 9-1-1
- Demographic characteristics (used to examine various groups' opinions of 9-1-1 and wireless location technology)

### *Survey Methodology*

The survey consisted of two parts: The 2000 RCN longitudinal survey on consumers' familiarity with the 9-1-1 system, and the Monitor Group-designed consumer survey on various 9-1-1 policy issues. The survey was sent online by Survey Sampling Inc. to a registered web panel whose demographic composition was matched to the demographic makeup of the total United States population. Qualifying adults were provided a modest incentive upon completion of the survey.

Approximately fifty responses were accepted from each state, with a total of 2,712 valid respondents. (This number of respondents allows for a statistically significant number of respondents within each state, as well as within the various demographic cuts that Monitor Group used in analyzing the data.) The respondent pool was evaluated to confirm a representative sample of the adult U.S. population based on key demographic variables of gender, urban / rural residency, age, income and wireless phone ownership. Cumulatively, the survey results have a maximum error of  $\pm 2\%$ .

### *Survey Results*

Data analysis shows a great awareness of the relative importance of 9-1-1 and wireless E9-1-1, even if many Americans remain unaware of how 9-1-1 operates. The data also indicates that most Americans are willing to bear some cost burden to support 9-1-1 and wireless E9-1-1, and that there is some alignment of opinion as to appropriate funding sources and mechanisms. The following is a general summary of significant findings:

- The American public is largely aware of the 9-1-1 system and believes that both the 9-1-1 system and wireless E9-1-1 are important priorities when compared to other public safety concerns, such as police, fire and Homeland Security
- 9-1-1 most frequently benefits individuals other than the caller; in nearly 10% of all 9-1-1 call situations, the caller reports a public safety incident (e.g., fire)
- Many Americans believe the federal government regulates local 9-1-1 service
- Most Americans are willing to subsidize 9-1-1 service in areas that can't afford it, in exchange for ensuring that wireless E9-1-1 is available everywhere

- 90% of Americans are “surprised and disappointed” upon finding that wireless Phase II service covers only 2%<sup>47</sup> of the country’s PSAPs
- Slightly more than half of respondents believe that wireless bills are an appropriate funding source for wireless E9-1-1; tax revenues are considered appropriate by more than one-third of respondents (*Please note, however, that this analysis could have been critically biased by several survey design factors*)
  - Most respondents prefer to pay for 9-1-1 using a monthly telecom surcharge
  - Fewer than 6% of current wireless subscribers are likely to switch or discontinue service due to a surcharge of \$1.00

### **Importance of E9-1-1**

The number of calls to 9-1-1, and the percentage of those calls originating from wireless phones, continues to increase annually. A majority of Americans (approximately 56%) have made a 9-1-1 call. Of this population, approximately 21% made their 9-1-1 call from a wireless phone; overall, 12% of the entire United States population has made a 9-1-1 call from a wireless phone. These numbers are expected to continue to increase as wireless phone penetration increases.

As the actual usage of 9-1-1 from wireless phones increases, so too does the perception that E9-1-1 is important. Upon hearing a description of wireless E9-1-1, nearly all respondents indicate that they believe implementing the technology is of some importance (99%), while nearly three-fourths of American adults believe it is of “great importance.” Wireless subscribers and previous 9-1-1 users are especially likely to believe this, with a statistically significant higher percentage of these respondents rating the technology as “of great importance.” The current focus on Homeland Security has also served to increase the importance of 9-1-1 — nearly 60% of Americans feel 9-1-1 is more important today than it was a few years ago due to the focus on Homeland Security.

9-1-1 and wireless location technology are also considered equally or more important than other public safety priorities (such as more police and fire patrol, training, or equipment). Nearly all Americans believe the 9-1-1 system and wireless E9-1-1 are as important as other public safety priorities (98% and 93% respectively), and a majority of Americans believe each is “somewhat more” or “much more” important (59% and 55%, respectively). Wireless subscribers and previous 9-1-1 users are again more likely than the total population to think 9-1-1 and wireless E9-1-1 are “much more important.”

A majority of Americans also believe that wireless E9-1-1 is at least as important as several national issues. Wireless E9-1-1 is considered “more important” or “about the same importance” as Universal Health Insurance (65%), Education (59%), Highway Maintenance (78%), and Homeland Security (75%). Wireless subscribers and previous 9-1-1 users again rated wireless E9-1-1 as more important than the total population did.

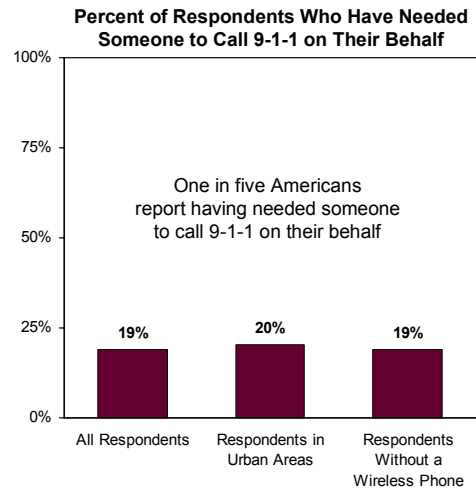
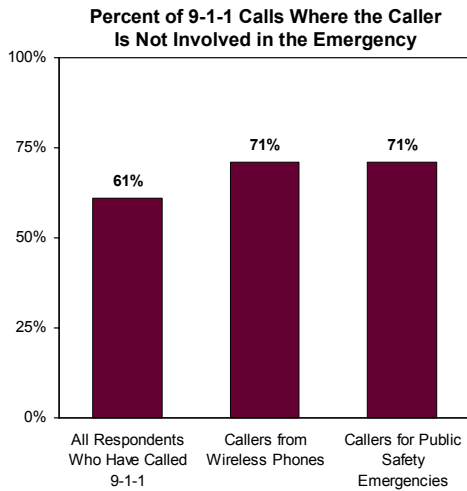
### **E9-1-1 as a Public Good**

Recent research conducted by Monitor Group provides evidence that the entire 9-1-1 system, and wireless E9-1-1 in particular, is largely a public good. As shown in the charts below, in more than 60 percent of all 9-1-1 call situations, the caller is not involved in the emergency being reported. Furthermore, callers from wireless phones are significantly more likely to place a call on behalf of other citizens. Approximately 10% of 9-1-1 calls report public safety incidents. Of these, 7 out of 10 are by a caller not involved in the emergency. Wireless calls are especially likely to be reporting public safety incidents; wireless 9-1-1 calls are 67% more likely to be reporting a public safety incident than calls from home landline phones. This data is consistent with most Americans’ beliefs regarding 9-1-1 and public safety emergencies. A large majority of Americans (88%) consider themselves likely to use a wireless phone to call 9-1-1 if they observe a public safety emergency, with this number increasing to 93% among current wireless subscribers.

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<sup>47</sup> Based on NENA DOT Registry at time of survey launch.

## E9-1-1 as a Public Good



Q: "The most recent time you made an emergency 9-1-1 call, were you involved in the emergency?" (yes / no); n=1,523 total, 315 callers from wireless phones, 145 callers for public safety emergencies

Q: "Have you ever needed someone to make an emergency 9-1-1 call on your behalf?" (yes / no); n=2,712 total, 2,235 respondents in urban areas, 790 respondents without a wireless phone

Note: Most responses statistically significant with 95% confidence

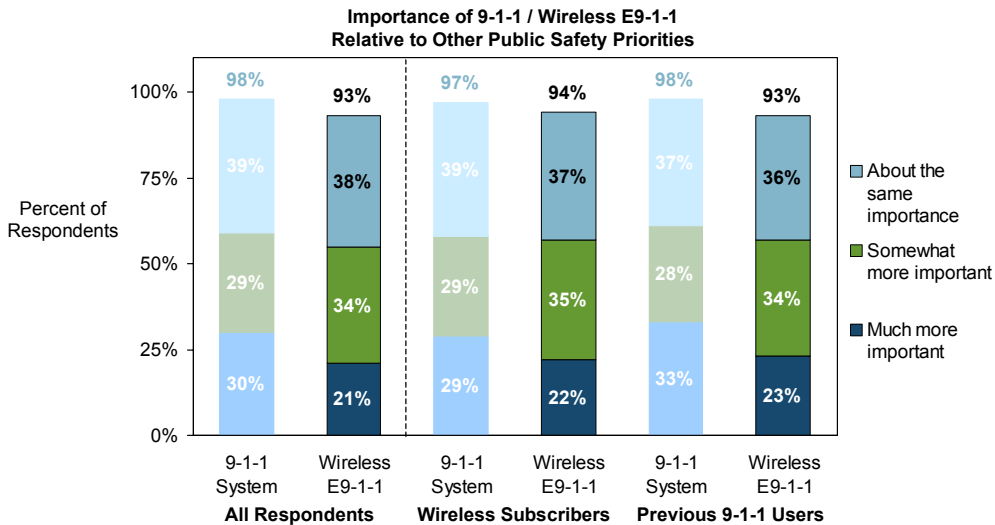
Source: Monitor Public Views Survey, 4-8 April 2003

A majority of respondents felt that implementation of wireless E9-1-1 was more important than other public safety priorities.

### Importance of E9-1-1

#### Wireless Location Technology Compared to Public Safety Priorities

*While wireless location technology is considered slightly less important than the 9-1-1 system, more than half of all constituent groups consider wireless E9-1-1 more important than other public safety priorities, like police and fire*



Q: "Compared to other public safety priorities (e.g., more police and fire patrols, training or equipment), how important is the implementation of E9-1-1 wireless location technology?" (Much more / Somewhat more / Same / Slightly less / Much less); n=2,712 total, 1,922 wireless subscribers, 1,523 previous 9-1-1 users

Note: Most responses statistically significant with 95% confidence

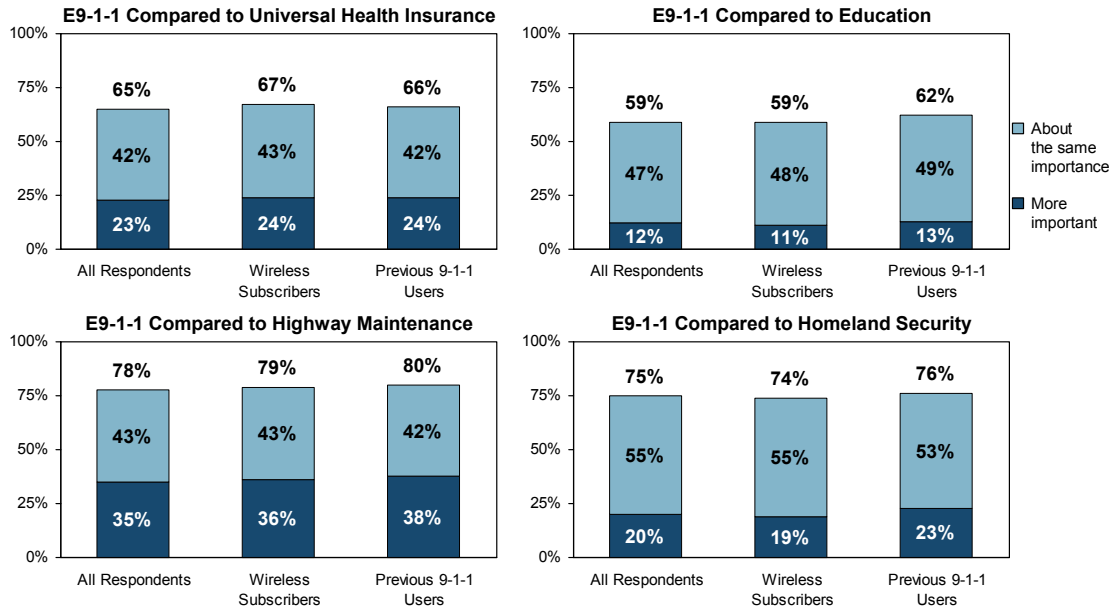
Source: Monitor Public Views Survey, 4-8 April 2003

A majority of respondents also felt that implementation of wireless E9-1-1 was at least as important as several other issues that receive national attention.

## Importance of E9-1-1

### Wireless Location Technology Compared to Other National Priorities

*A majority believe wireless E9-1-1 is at least as important as several national issues*



Q: "Please rate the importance of wireless E9-1-1 location technology in comparison to each of these other national issues." (E9-1-1 is more important; About the same importance; E9-1-1 is less important); n=2,712 total, 1,922 wireless subscribers, 1,523 previous 9-1-1 users  
 Note: Most responses statistically significant with 95% confidence  
 Source: Monitor Public Views Survey, 4-8 April 2003

## Rationale for a National / Federal Mandate

A significant portion of Americans already believe that state or federal government plays a role in operating 9-1-1 service. One in three Americans believes the federal government regulates 9-1-1 service, and nearly half (44%) are "not sure" if the federal government regulates 9-1-1. When asked who is responsible for operating 9-1-1 service, one in ten Americans name the federal government or state fire department, and one in five name the state police department.

The need for a national / federal mandate is bolstered by wireless-usage characteristics. Thirty-seven percent of wireless talk-time is conducted outside the caller's billing area, meaning that surcharges may not be distributed in the areas where calls are actually made. Eighty-five percent of wireless subscribers use their wireless phones outside of their billing area at least part of the time, and 5% of wireless subscribers always use their wireless phones outside of their billing area.

These usage characteristics increase the necessity of ubiquitous wireless E9-1-1. In order to ensure full deployment of E9-1-1, a majority of Americans (56%) are willing to subsidize E9-1-1 in areas that cannot afford it. Included in this group are respondents in urban areas and high population states, those most likely to subsidize less populous areas.

## Preferred Funding Mechanisms

*The following analysis with respect to funding mechanisms may have been biased by the fact that survey respondents may not have approached questions on wireless surcharges with the full context of already existing E9-1-1 charges in mind.* When asked to rate the appropriateness of several potential funding sources for wireless E9-1-1, respondents show a strong preference for wireless phone bills, with over half of respondents (56%)



deeming wireless bills “most appropriate,” or “more appropriate” than other funding sources. State / local and federal tax revenue are considered appropriate by more than one-third of respondents.

Though most demographic groups agree that wireless bills are most appropriate, there are significant differences across groups regarding the degree of appropriateness of various funding sources. Wireless subscribers are more likely to consider state / local tax revenue appropriate (37%, compared to 29% for non-subscribers), but less likely to consider wireless bills appropriate (53%, compared to 64% for total). Respondents in Democrat-dominant states are more likely than respondents in Republican-dominant states to favor federal tax revenue (41% to 35%). Urban respondents are more likely than rural respondents to favor state / local tax revenue (35% to 31%), and respondents in small-population states are less likely to favor state / local tax revenue than respondents in high-population states (30% to 37%).

Regardless of beliefs about appropriate funding sources, Americans are generally in agreement regarding appropriate billing mechanisms. Four out of five Americans prefer a recurring monthly fee of \$0.50–\$4.00 over one time or per-use charges.

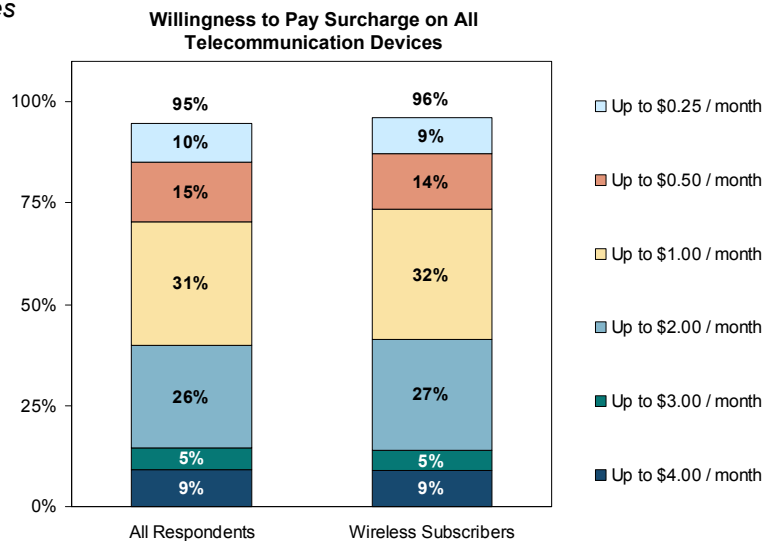
### Consumer Willingness to Pay

Most Americans are willing to incur costs to support wireless E9-1-1, and current wireless subscribers are slightly more willing to pay higher surcharges. Ninety-five percent of total respondents are willing to pay at least a \$0.25 per month surcharge on their telecom bills, and 70% are willing to pay \$1.00 or more.

*Please note, however, that this analysis could have been critically biased by several survey design factors:* 1) survey respondents may not have approached questions on wireless surcharges with the full context of already existing E9-1-1 charges in mind; 2) respondents may have been further biased by the number of times they pay surcharges on their aggregate landline and wireless access lines; 3) respondents may have been biased toward the relative value of E9-1-1 by virtue of having answered earlier questions in the survey.

### Consumer Willingness to Pay All Telecom Surcharge

*Most Americans are willing to pay at least a 25 cent-per-month surcharge on all telecom devices; current wireless subscribers are, on average, slightly more willing to pay higher surcharges*



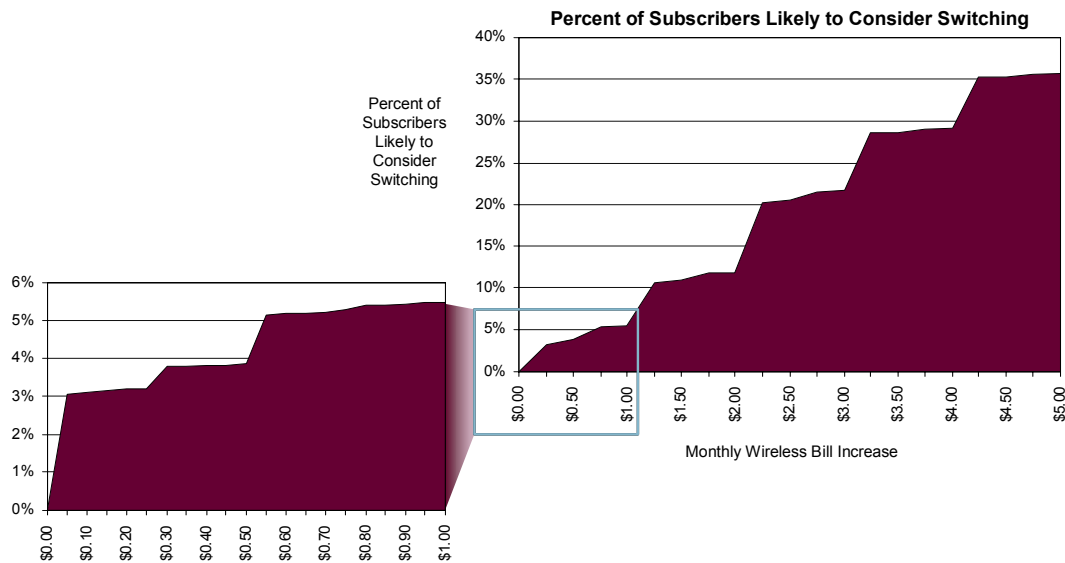
Q: “Assume the cost of implementing wireless E9-1-1 location technology were supported using a recurring monthly fee on traditional landline telephone bills, wireless telephone bills and / or other telecommunication service bills. (I would be willing to pay up to \$4.00 / \$3.00 / \$2.00 / \$1.00 / \$0.50 / \$0.25 per month / I am not willing to pay for 9-1-1 technology and would cancel services that had this fee); n=2,712 total, 1,922 wireless subscribers

Note: Most responses statistically significant with 95% confidence  
Source: Monitor Public Views Survey, 4–8 April 2003

Again, with caveats for the survey design issues noted above, it appears that few wireless subscribers would consider switching or discontinuing their service due to surcharges. Ninety-four percent of current wireless subscribers would not consider switching due to an increase of \$1.00 on their monthly bill and there is little difference in willingness to pay surcharges between subscribers of different wireless companies. Not only are subscribers generally willing to pay monthly surcharges for E9-1-1, but nearly half of all wireless subscribers (46%) would be “pleased” with a \$2.00 surcharge, while fewer than 7% indicate that they would switch providers or discontinue service due to such a surcharge, even if all carriers had similar charges.<sup>48</sup> Not only are subscribers generally willing to pay monthly surcharges for E9-1-1, but nearly half of all wireless subscribers (46%) would be “pleased” with a \$2.00 surcharge, while fewer than 7% indicate that they would switch providers or discontinue service due to such a surcharge, even if all carriers had similar charges.<sup>49</sup>

## Consumer Willingness to Pay Wireless Switching Tolerance

94% of current wireless subscribers would not consider switching due to an increase of \$1.00 on their monthly bill



Q: “How much would your monthly bill for your wireless telephone service have to increase for you to consider switching providers or canceling service?”  
(Free response answer in dollars and cents); n=1,903  
Source: Monitor Public Views Survey, 4-8 April 2003

<sup>48</sup> The specific question asked of respondents who were wireless subscribers was: “Assume your current wireless provider chooses to implement 9-1-1 wireless location technology in its coverage area, and due to the cost of providing this service your monthly bill increases by \$2.00. Which of the following statements best reflects your response?”

<sup>49</sup> The specific question asked of respondents who were wireless subscribers was: “Assume your current wireless provider chooses to implement 9-1-1 wireless location technology in its coverage area, and due to the cost of providing this service your monthly bill increases by \$2.00. Which of the following statements best reflects your response?”

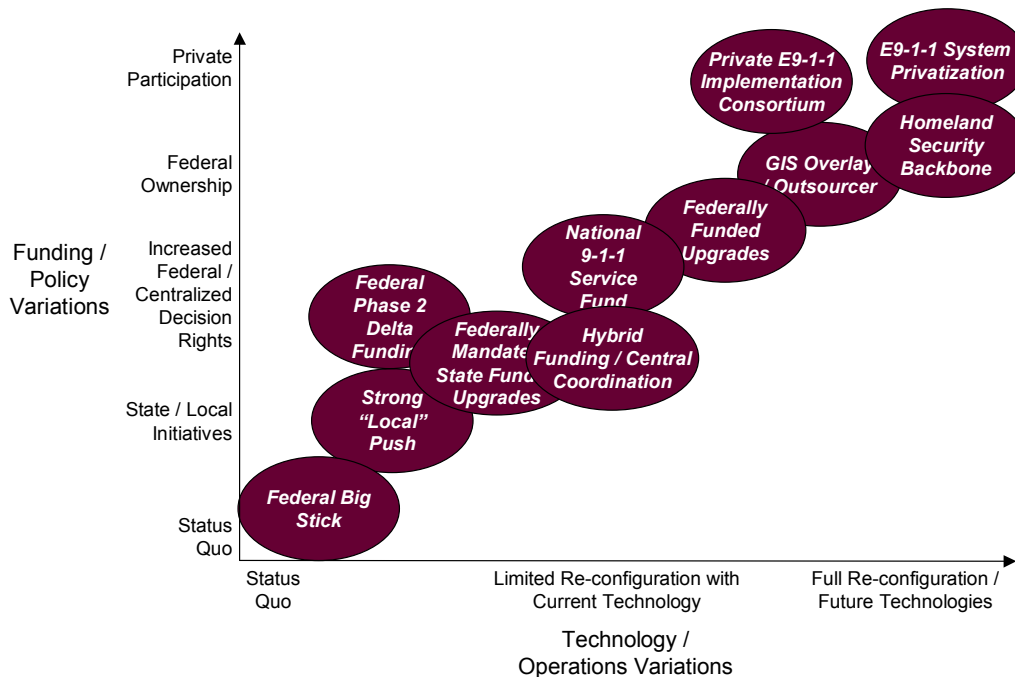
## 13 Other Broad Options Considered

In the course of the SWAT E9-1-1 Stakeholders’ Initiative, Monitor Group developed numerous potential E9-1-1 “solution options” for evaluation and multi-party discussion. Many of these options contributed elements that were integrated into the Initiative’s discussions and continue to provide a source of alternative ideas to turn to, in order to resolve outstanding issues and areas of debate. All told, 11 distinct options, each with multiple variants, were developed and evaluated. Solution options refers to a “complete” solutions which incorporate numerous *solution components* e.g., funding, coordination, monitoring, etc.

The chart below arrays these options across funding / policy and technical / operations dimensions, which were determined to be the primary variables in the process of constructing different solution options. Seven preliminary options were created to cover the range of possible solutions, ranging from solutions closer to the status quo on the bottom left, to more ambitious solutions representing significant change vs. today toward the upper right. Subsequent input from SWAT and E9-1-1 Initiative participants helped inform the creation of four other options. In the chart, the two areas in the upper left and lower right struck us as likely implausible or not viable, due to the lack of internal consistency. For example, it is difficult to imagine that the status quo in terms of funding and policy could also yield a solution that calls for full reconfiguration of the PSAP system, complete with advanced technologies.

Below is a brief description of the underlying premise and main substance of each of the options considered, as well as a high level view of the primary challenges with each.

### Options Developed and Considered



#### Strong “Local” Push

*Premise:* Public safety is fundamentally a local problem and needs to be resolved locally for a solution to stick. Local grassroots *voter pressure* on local governments creates ample reason for funded but “misbehaving” states to behave, and for non-funded states to find funds.

*Description:* Spearheaded by public safety organizations, state and local PR “viral” campaigns are launched to ensure Phase II deployment and new technology development. The effort would be kick-started by recruiting state 9-1-1 coordinators of leading localities. The effort would make aggressive use of national and local media, as well as the federal bully pulpit through the E9-1-1 Caucus, FCC, DOT, and DHS. Public safety and federal entities would promote cost recovery for WSPs, but no specific legislation or rule making would come from federal entities.

*Challenges:* This option is viewed as not very viable or likely to achieve critical public policy goals. While the option does respect local control, goals of ubiquity, timeliness and future proofing are clearly under-addressed. Most critically, it does not address funding options which is a known barrier for many PSAPs. However, given the importance of local jurisdictions, aspects of building grassroots support are likely an important element to be incorporated in all solutions.

### *Federal Phase II Delta Funding*

*Premise:* The status quo primarily lacks funding and coordination due to the extremely fragmented nature of the decisions needed to close the gap. Federal government is best placed to provide minimum PSAP funding to resolve the current gaps, as well as to drive timely, ubiquitous Phase II deployment. A “fair” solution spreads the cost burden for supporting the infrastructure of a public good across the broadest tax base, and importantly, delineates federal dollars only for CAPEX supporting that infrastructure.

*Description:* The Federal government fills state and local PSAP funding gaps for all upgrade CAPEX required to achieve Phase II. Tied to funding, the federal government specifies the states meet certain minimum requirements e.g., creation of state 9-1-1 coordinators, and ensure WSP cost recovery. Public safety works with PSAPs particularly on technical and operational areas to help them meet requirements and achieve Phase II.

*Challenges:* The biggest issue with this option in its purest form is that it does not address the incentives problem, at least as far as the state and local administrations are concerned. There are no mechanisms provided to prevent state governments from using current E9-1-1 surcharges for other purposes — which in a highly budget-constrained environment, they are inclined to do. Moreover, an option where the federal government fills in the “delta” without associated funding conditions for appropriate use of funds would create further incentive to raid E9-1-1 monies and further exacerbates the raiding problem present in the status quo. Further, while the option does provide for very critical funding, it does not cover all funding requirements (i.e., ongoing incremental operating expenditures), nor does it refer to the importance of future proofing issues (e.g., not precluding future solutions), potentially setting up the system to be in crisis several years down the road.

### *Federally Funded Upgrades*

*Premise:* Substantial federal oversight, funding and leadership are critical to ensuring needy localities receive funding, while advanced localities are motivated to upgrade further. The role of the federal government here is to be the primary funding source and also to manage the states’ incentives and induce compliance. The funds are available from the federal government; some of these funds, e.g., Spanish American War Tax, should in fact rightfully be allocated to 9-1-1 issues as they are collected via a surcharge.

*Description:* Federal challenge grants, e.g., from DHS, or from tax revenues such as the Spanish American War tax, are awarded for following a prescribed upgrade path to Phase II. The federal government stipulates minimum requirements for the states e.g., establishment of a state 9-1-1 coordinator, no raiding of funds, WSP cost recovery, conformity to SSP tariff guidelines. The entity provides bonus incentives for creating and following a future technology upgrade plan. Federal sanctions, e.g., withholding of highway funding, are applied if Phase II is not achieved for 100% population coverage by a specified date.

*Challenges:* This option poses two challenges: The first is that solely relying on the federal government to provide full funding is potentially problematic given the current fiscal environment. The second issue is that the federal government would likely be extremely prescriptive in state and local affairs, as it bears the bulk of the

funding burden for both PSAP and WSP cost recovery; this degree of intervention is likely to be resisted by state and local governments.

### *Homeland Security Backbone*

*Premise:* Homeland security imperatives provide a compelling “product” context for 9-1-1 to ensure federal leadership and drive the case for funding a national 9-1-1 and emergency communications infrastructure while addressing the need for central 9-1-1 coordination.

*Description:* DHS invests in a national communications infrastructure, which includes the 9-1-1 network. Certified PSAPs are mandated to plug into a DHS-controlled broadband network of transport, routers, and databases. Advanced technology features e.g., early warning system, reverse 9-1-1 etc., are incorporated into the infrastructure. DHS funds Phase II and advanced technology upgrades. Localities remain responsible for adequately funding ongoing PSAP operations and maintenance costs, or face penalties.

*Challenges:* This option suffers from a number of hurdles, the largest of which is the likely time delays required to obtain funding and coordination through the auspices of the DHS, which will be dealing with the challenges of coordinating its own bureaucracy. The added complication of creating such an advanced network, while clearly a worthy aspiration, is deemed not more important than achieving ubiquity of Phase II under the existing infrastructure. In addition, concern exists about an unacceptable level of federal involvement being added to the local decisions related to the 9-1-1 system.

### *GIS Overlay Outsourcer*

*Premise:* A GIS “plug” offers the fastest national Phase II solution, given the local “pork” driving competition among localities, while allowing maximum local choice and flexibility and using local cost-saving potential to drive efficiency.

*Description:* Federal government mandates creation of pan-regional GIS centers to provide location information for all jurisdictions lacking Phase II capabilities. The GIS centers use a limited number of in-place Phase II capable and scalable PSAPs to constitute the “GIS network hubs”. Hubs also offer cost / quality competitive Phase II service on an outsourced basis to states and localities. WSP cost recovery is stipulated; SSP tariff guidelines are issued.

*Challenges:* This option is viewed as an interesting idea, but an expensive and complex half-measure requiring significant effort to pull off. Because this option does not necessarily encourage full Phase II integration in all PSAPs, the costs are likely to be additive, rather than resulting in any system-wide savings. Questions were also raised on the complexity required to ensure service quality in terms of call response / handling time.

### *E9-1-1 System Privatization*

*Premise:* Profit motive is required to drive efficiency gains, timely deployment of new technologies and advanced services, and market-based distribution of cost burden.

*Description:* The federal government mandates formation of (semi) private regional entities (NewCo) to run complete Phase II capable systems and to deploy advanced technologies and services. During a transition period, the federal government provides the legal framework, guidelines and oversight for transfer of existing assets and personnel (except dispatch) to NewCo. The federal government also provides limited funding to jumpstart NewCo, e.g., pay for asset transfer, job transitions and training costs. NewCo finances Phase II upgrades with private capital.

*Challenges:* This option is viewed as the most challenging, as it represents substantial change across several critical dimensions. First, this option would require a significant shift in paradigm by transferring a public good over to a private entity. Second, the transfer of assets is deemed particularly difficult in terms of getting all parties, public and private, to agree on valuation, and also from a political viability standpoint given anticipated state and

local resistance. The combination of all these changes would simply present too great a barrier to cross and would result in significant time delays.

### *Federal Big Stick*

*Premise:* Compliance follow-through, as opposed to new funding, per se, is THE critical issue, requiring sanctions to be more widely applied by the federal government.

*Description:* A wider net of federal sanctions and penalties is imposed on stakeholders to ensure Phase II implementation. In addition to the FCC maintaining enforcement of current timelines for WSPs, it also looks for levers to compel the SSPs to facilitate accelerated deployment. The DOT uses highway fund cross-over sanctions to the states to accomplish a number of aspects conducive to Phase II deployment, including establishment of a State 9-1-1 program office and coordinator, PSAP certification, etc.

*Challenges:* While the option does align incentives across the stakeholders, it does so with a heavy hand, which is likely to result in considerable non-compliance and time delays due to its adversarial nature. This option also essentially represents an unfunded mandate that the states and localities are likely to resist. This option also likely puts the states in an untenable position: No funding but full responsibility despite a lack of control over locally controlled PSAPs.

### *Federally Mandated State Funded Upgrades*

*Premise:* Federal Government believes E9-1-1 is a State / local responsibility, and raiding of funds is central. The States have tools, funding potential, and responsibility to create ubiquity; however, there is need for Federal pressure to change status quo.

*Description:* This option largely draws upon elements in the Federal Big Stick and Strong “Local” Push. Federal legislation is passed which stipulates certain minimum requirements states must achieve by specified deadlines e.g., fully functional state 9-1-1 coordinator, achievement of Phase II ubiquity, cost recovery for WSPs. The legislation also places a cap on E9-1-1 related telephone bill surcharges, mandating the states address any funding gaps through other means. States would be held in compliance through cross-over sanctions, e.g., withholding of highway funds. A small amount of federal funding would be made available as incentives for application of new technologies.

*Challenges:* Political viability, both in Washington and in the states and localities, is the largest hurdle for this option. While the option does successfully respect local decisions on how to achieve Phase II, it would likely be strongly resisted by states and localities, being viewed as an imposition of federal requirements and penalties and essentially an unfunded mandate. States would resist any federal requirements on their ability to place surcharges on telephone bills, and would likely circumvent the mandate through other excise taxes. Carriers similarly view this option as sub-optimal. Despite mandating cost recovery, the option achieves this solely through telephone bill surcharges, and in a manner that is not uniform and likely to be over-used by states and localities. Further, the prospects of successfully implementing a cap on state and locally legislated surcharges are viewed as low.

### *National 9-1-1 Service Fund*

*Premise:* E9-1-1 needs a dedicated national funding source and oversight committee to ensure timely funding, eliminate raiding, and provide cross-subsidization. However, preservation of some state / local decision rights is necessary for political viability.

*Description:* This option largely is largely patterned from the Universal Service Fund model and draws upon central coordination elements of the Federally Funded Upgrades option while avoiding dependence on funding from the Federal government. Federal legislation stipulates a national 9-1-1 service surcharge to replace all existing state / local / carrier 9-1-1 related surcharges. Legislation creates a quasi-governmental 9-1-1 Service

Board, overseen by the FCC, which is responsible for collecting and distributing the funds to states and WSPs for cost recovery, authorizing and enforcing adherence to certain minimum requirements states must achieve by specified deadlines, e.g., fully functional state 9-1-1 coordinator, achievement of Phase II ubiquity. States would be held in compliance through cross-over sanctions e.g., withholding of highway funds and withholding of 9-1-1 Service Fund fees. A portion of the Fund would be allocated as incentives for application of new technologies.

*Challenges:* Political viability, both in Washington and in the states and localities is the largest hurdle for this option. The biggest stumbling block is the notion of replacing existing state / locally imposed surcharges with a national charge and preventing states from adding any additional 9-1-1 related surcharges in the future. While there is a logic for a consolidation of the funding source into a single mechanism such as a federal surcharge, given the status quo inertia of multiple state-level surcharges, it is unlikely that any federal mandate to replace these state surcharges with a single federal one would succeed — underscoring a fundamental states’ rights issue. A national service board may be needed to address the need for central coordination, however, the board’s scope and role needs to be clearly defined and must not overly create layers of bureaucracy. Holding the states to minimum requirements and timelines makes be fair, provided they are not unfairly penalized from “hold-out” counties or localities.

### *Private E9-1-1 Implementation Consortium*

*Premise:* Profit motive and a privatized model is the most effective way to ensure efficient Phase II deployment, future service quality improvement, and to ensure E9-1-1 funds are not diverted.

*Description:* This option draws considerably from the E9-1-1 System Privatization option, but attempts to minimize the transfer of assets that was viewed as non-viable. Federal legislation stipulates Phase II deployment timelines for states and authorizes a private entity, made up of a consortium of industry players, to coordinate deployment nationally among carriers and PSAPs, determine appropriate surcharges for funding and cost recovery, and to collect and distribute all surcharge based funds.

*Challenges:* Questions around likely effectiveness of this solution to drive Phase II deployment raise the greatest challenge to this option. Questions exist on whether the private entity would do enough to a) accelerate deployment among carriers, b) reduce underlying complexity of PSAPs environment, thus not addressing cost reduction or timely deployment; c) overcome political viability concerns raised at state / local level due to loss of control of funding sources, and d) unclear economic opportunity for the carriers or the NewCo.

### *Hybrid Funding / Central Coordination*

*Premise:* Relative to funding, status quo inertia dictates that the current state / local surcharge-funding mechanisms will remain in place for the foreseeable future. However, incremental funds are still required to close PSAP funding gaps and to provide WSP cost recovery, and central coordination is essential to ensure proper channeling of funds and efficient E9-1-1 deployment. The current fiscal and political environment suggests the federal government is unlikely to fund the entire E9-1-1 delta, and WSPs and SSPs would find a 100% national surcharge over-burdensome and competitively distorting. Splitting the delta funding between federal dollars and a small national surcharge makes federal funding more viable and imposition of a national surcharge small and competitively neutral relative to status quo. However, the solution also explicitly recognizes that funding alone is insufficient, and thus includes a central coordinator and the imposition of new state mandated timelines (enforced via cross-over sanctions, e.g., with highway funds) with respect to PSAP readiness, and with WSP timelines harmonized the new state / PSAP timeline. The solution thus seeks to ensure retention of states’ rights (balancing sticks with carrots, and recognizing the ongoing existence of state-level surcharges), aligned incentives across industry and the states, maintenance of the current competitive surcharge status quo, and the solution begins to shift funding burden for public good to the broader public and the federal government, while recognizing a tight funding environment.

*Description:* This option draws upon elements of Federally Funded Upgrades, Federally Mandated State Funded Upgrades and National 9-1-1 Service Fund. E9-1-1 delta funding is split 50/50 between a small, national surcharge and federal funds (i.e., from general treasury, either via incremental general tax or deficit spend).

Federal legislation creates a quasi-governmental national 9-1-1 Service Board, overseen by the FCC, largely patterned from the NANC and USAC models while addressing critical flaws in those models. The 9-1-1 Service Board is responsible for collecting and distributing the funds to states and WSPs for cost recovery, provides a set of carrots and sticks to states to better ensure timely rollout — including cross-over sanctions for failure to meet PSAP readiness timelines, provides better uniformity across states through the mandated state coordinator function, specifies guidelines for PSAP efficiency and interoperability, and develops a coordinated timeline and approach for future 9-1-1 network architecture and incorporation of new 9-1-1 capable technologies and devices.

*Challenges:* There are two primary challenges to this option. The first is the strong resistance from many WSPs and SSPs to any incremental surcharge, no matter how small. The concern is that a new surcharge is, in effect, a new portal to levy taxes via the telecom providers, and that surcharges never go away, and typically only increase over time once established. A related concern is that the existence of both state / local level surcharges and a federal surcharge is a recipe for creating loopholes for inappropriate use of E9-1-1 earmarked funds. On the question of surcharges, there are also lesser concerns about fairness and how such a similar burden would be shared with “new” services and devices, e.g., VOIP and PDAs. The second primary challenge to this option is around the use and the original definition of the national 9-1-1 Service Board coordination mechanism. Although the critical need for central coordination is clear, concerns center on crafting an appropriate role for a new bureaucracy that would not be too onerous and interventionist, in order that states with successfully functioning E9-1-1 programs will not be unduly burdened. Further, recent negative experiences with NANC and USAC raise considerable concerns about creating another such entity, primarily around its funding mechanism.



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## 15 Glossary

**AIN: Advanced Intelligent Network.** A network that is able to route 9-1-1 calls and associated data to PSAPs along the public phone network without selective routers.

**APCO: Association of Public Safety Communications Officials**

**ATIS: Alliance for Telecommunications Industry Solutions**

**CALEA: The Communications Law and Enforcement Act**

**CAMA: Centralized Automated Message Accounting.** Analog trunks are that typically used for 9-1-1 calls from end offices or MSCs to the selective router, and from the selective router to the PSAP.

**CLEC: Competitive Local Exchange Carrier**

**CFA: Consumer Federation of America**

**CMRS: Commercial Mobile Radio Services**

**CTIA: Cellular Telecommunications and Internet Association**

**DBMS: Database Management System**

**DHS: Department of Homeland Security**

**DOT: Department of Transportation**

**GIS: Geographic Information System.** A computer system capable of assembling, storing, manipulating, and displaying geographically referenced information, i.e., data identified according to their locations.

**ILEC: Incumbent Local Exchange Carrier**

**LATA: Local Access and Transport Area.** A district within which a call is considered local. Calls that are transported within one LATA are considered local. Calls transported from one LATA to another LATA are considered long-distance.

**LBS: Location Based Services.** Services sold by wireless carriers to their subscribers that utilize data about the exact location of a subscriber in order to provide information relevant

**LEC: Local Exchange Carrier.** Telephone companies that provide local wireline telephone service

**MSC: Mobile Switching Center.** Mobile Switching Center. A switch that routes wireless calls, and in E9-1-1 network will have direct trunking to the selective router.

**NANC: North American Numbers Council.** A federal advisory committee created to make recommendations to the FCC on numbering issues

**NARUC: National Association of Regulatory Utilities Commissioners**

**NASNA: National Association of State 9-1-1 Administrators**

**NCSL: National Conference of State Legislatures**

**NENA: National Emergency Number Association**

**NGA: National Governors Association**

**NORAD: North American Aerospace Defense Command**

**NTIA: National Telecommunications and Information Administration**

**PDA: Personal Digital Assistant**

**PDE: Position Determining Equipment.** Hardware and associated software used in the wireless network to determine the location of wireless subscribers

**PSAP: Public Safety Access Point**

**PUC: Public Utilities Commission.** A state agency that typically has responsibility for regulating telecommunications

**SR: Selective Router.** A Telephone switching center which receives 9-1-1 calls from other offices, and routes them to the proper PSAP.

**SSP: 9-1-1 System Service Providers.** The party responsible for maintaining 9-1-1 databases. The SSP can be either an ILEC or a third party provider such as Intrado

**SS7: Signaling System 7.** An “out of band” signaling system that uses data packets traveling on a separate physical network. SS7 may be used in place on CAMA in an E9-1-1 network.

**STP: Signal Transfer Point.** A switching center that provides for the transfer from one signaling link to another.

**SWAT: Strategic Wireless Action Team**

**USAC: Universal Service Administration Company.** USAC is a private, not-for-profit corporation responsible for providing every state and territory in the United States with access to affordable telecommunications services through the Universal Service Fund

**USF: Federal Universal Service Fund**

**USTA: United States Telecomm Association**

**Telematics:** The integration of wireless communications, vehicle monitoring systems and location devices for use in automobiles.

**VOIP: Voice Over Internet Protocol.** Telephone service provided through the Internet

**WSP: Wireless Service Provider.** A company providing wireless service to users of mobile phone



A not-for-profit corporation, the National Emergency Number Association (NENA) is the only educational organization dedicated solely to the study, advancement and implementation of 9-1-1 as America's universal emergency number. NENA's mission is to foster the technological advancement, availability, and implementation of an universal emergency telephone number system, with the objectives of protection of human life and preservation of property and community security.

In carrying out its mission, NENA promotes research, planning, training and education. NENA is currently engaged in several important initiatives:

- Strategic Wireless Action Team (SWAT): Designed to resolve the most challenging issues facing deployment of E9-1-1, SWAT brings together the critical parties responsible for delivery of E9-1-1 and provides a constructive venue for multi-party dialogue and design of practical deployment solutions.
- Report Card to the Nation (RCN): To understand how well 9-1-1 serves the nation, NENA has evaluated and graded the performance of 9-1-1 on several dimensions. The first results were released on September 11, 2001 with periodic updates forthcoming.
- NENA PSAP Registry: The PSAP Registry provides a central database of up-to-date contact information for PSAPs to ensure that accurate, timely, and efficient information is passed to relevant stakeholders in emergency situations.
- NENA Wireless Implementation Program – USDOT's Wireless E9-1-1 Implementation Support: A joint NENA – USDOT program in partnership with APCO, NASNA and other stakeholders, helps to stimulate Wireless Phase I and Phase II implementation.
- Future Planning and standards setting: Taking into account how people communicate today and tomorrow, NENA is developing a path for the technical evolution of 9-1-1 infrastructure, equipment and operations.
- Emergency Services Interconnection Forum (ESIF): In cooperation with ATIS, NENA has jointly convened ESIF to help address interconnection between the many parties that deliver 9-1-1.
- Public Policy: NENA provides support to the many state and local public policy efforts to help foster the deployment of ubiquitous 9-1-1.

For more information, please visit [www.nena.org](http://www.nena.org).

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