

HB

499

List Of Testifiers In House Community And Regional Affairs  
March 2, 2004

Mark Johnson , Chief, Section of Community Health & Emergency Medical Services  
(465-8635)

Jim Rowe, Anchorage Telephone Association

Robert Griffiths , National Emergency Number Asssociation (NENA), Palmer

Jim Harpring, NENA, Fort Richardson

Bill Doolittle, NENA/Municipality of Anchorage

Mark Mew, NENA, Anchorage

Ed Oberts, Kenai Penninsula Borough

Steve Thompson, Fairbanks Mayor

Al Storey, Alaska State Troopers

Kevin Ritchie, Alaska Municipal League (586-1325)

Alex von Widman (sp?) GCI (523-3200) signed up but did not testify



### Range of 9-1-1 Surcharges

Exact amounts may be adjusted locally  
 (\* as of July, 2003. Remaining states are being verified)

State	Wireline	Wireless
Alabama*	\$2.00 (max)	\$0.70
Alaska*	\$0.50 - 0.75	\$0.50-0.75
Arizona*	\$0.37	\$0.37
Arkansas*	\$0.77	\$0.50
California	Based on Access fees	Based on Access fees
Colorado	\$0.70	\$0.70
Connecticut*	\$0.20	\$0.20
Delaware*	\$0.50	\$0.60
District of Columbia	None	\$0.56
Florida	\$0.50	\$0.50
Georgia*	\$1.50	\$1.00
Hawaii*	\$0.27	None
Idaho*	\$1.00 (max)	\$1.00 (max)
Illinois	\$1.25	\$0.75
Indiana	3-5% of monthly access	\$0.65
Iowa*	\$0.25-\$2.50	\$0.50
Kansas*	\$0.75 (max)	None
Kentucky*	\$1.75	\$0.70
Louisiana*	\$1.00 Res \$2.00 Bus	\$0.85
Maine*	\$0.50	\$0.50
Maryland*	\$0.60 (will be \$1.00 10/1/03)	\$0.60 (will be \$1.00 10/1/03)
Massachusetts	funded by directory assistance	\$0.30
Michigan*	\$0.19-\$3.00	\$0.52
Minnesota*	\$0.55	\$0.50
Mississippi*	\$1.00 Res \$1.00 Bus	\$1.00
Missouri	\$1.50 (max)	None
Montana	\$0.50	\$0.50
Nebraska*	\$0.25 - \$1.00	\$0.50
Nevada	Tax based	\$0.25
New Hampshire*	\$0.42	\$0.42
New Jersey	General Fund	General Fund
New Mexico	\$0.51	\$0.51
New York*	\$0.35	\$1.20 - \$1.50
North Carolina*	Local ordinance \$0.25 - \$4.00	\$0.80
North Dakota	\$1.00	\$1.00
Ohio*	\$0.50 (max) (limited to a few Counties, no general surcharge)	None (\$0.65 proposed)
Oklahoma*	3-5% of monthly recurring charges (up to 15%)	\$0.50
Oregon*	\$0.75	\$0.75
Pennsylvania*	\$0.74-\$1.50	\$1.00
Rhode Island	\$0.60	\$0.60
South Carolina*	\$0.50-\$1.50	\$0.59
South Dakota	\$0.75	\$0.75
Tennessee	\$0.65-\$2.00 / \$1.50-\$3 special	\$1.00
Texas	\$0.50	\$0.50
Utah	\$0.53	\$0.53
Vermont	Universal Service Funding	Universal Service Funding
Virginia*	\$3.00 (max)	\$0.75
Washington*	\$0.20 statewide \$0.35-50 by counties	\$0.25
West Virginia*	\$0.55 - \$3.75 by County	\$1.43
Wisconsin	\$1.00	None
Wyoming	\$0.50	None

## Executive Summary

The purpose of this report is to convey the results of an independent inquiry into the technical and operational issues affecting the deployment of wireless Enhanced 911 ("E911") services in the United States. The inquiry was carried out by the author on behalf of the Federal Communications Commission ("Commission") over a six month period beginning on April 15, 2002.

Before turning to my principal findings and recommendations, I would like to offer three preliminary comments:

*First*, the importance of 911 as the Nation's universal emergency assistance number has long been recognized. That importance was acknowledged with the passage of the Wireless Communications and Public Safety Act of 1999. Subsequent developments, e.g., the tragic events of September 11, 2001 and growing dependence on wireless networks, serve to further emphasize the importance of E911 in general, and wireless E911 in particular, to the safety of life and property and homeland security. The automatic provision of location information with wireline and wireless 911 calls – i.e., E911 – is critical to those emergency services.

*Second*, over the past several years, the center of attention of the industry has clearly shifted from discovering, developing, evaluating and selecting the ways of locating mobile units in wireless systems to integrating the location information into the existing E911 system. I regard this as very good news as it indicates that there is no longer any real disagreement regarding the technical feasibility of providing wireless E911 to the approximately 130 million wireless subscribers in the United States. The challenge now is to successfully complete the implementation of wireless E911, a process that has really just begun.

*Third*, one over-arching issue that immediately emerged in my inquiry is that the existing wireline E911 infrastructure, while generally reliable, is seriously antiquated. Indeed, it turns out that the existing wireline E911 infrastructure is built upon not only an outdated technology, but one that was originally designed for an entirely different purpose. It is an analog technology in an overwhelmingly digital world. Yet it is a critical building block in the implementation of wireless E911.

From a national policy perspective, this latter observation is troubling for a number of reasons. It is troubling because it means that the additional network elements and functionalities necessary to handle the increasing volume of wireless E911 calls are being built upon a platform or foundation that has serious limitations in terms of speed, scalability, and adaptability. Additionally, it is troubling because these limitations not only burden the development of wireless E911 services, but they will also constrain our ability to extend E911 access to a rapidly growing number of non-traditional devices (e.g., PDAs), systems (e.g., telematics) and networks (e.g., voice networks that employ Voice-over-the-Internet Protocol -- VoIP). Finally, it is troubling because of uncertainty surrounding the willingness and ability of Public Safety Answering Points ("PSAPs") to

pay for wireless E911, let alone the other, long term upgrades to the local exchange carriers' networks and their own customer premises equipment necessary to provide E911 access to these emerging devices, systems, and networks.

With respect to the specific technical and operational issues relating to the implementation of wireless E911 services, I have reached six principal findings or conclusions.

- *First*, I find that there is a strong Federal interest in the implementation of wireless E911 and that that interest has increased as a result of the tragic events of September 11, 2001. I further conclude that existing Federal programs to encourage the implementation are fragmented and that the most visible program, while very commendable, does not totally reflect the broader implications of wireless E911 for the safety of life and property and homeland security. My concern about this issue is compounded by the fact that a number of states have failed to establish a state-wide coordination body and/or appropriate cost recovery mechanisms.
- *Second*, I find that the deployment of wireless E911 in the U.S. is an extremely complex undertaking and that a variety of critical technical and operational choices – including critical decisions relating to network architectures – must be made to ensure the reliable and seamless E911 system contemplated by Congress when it passed the 911 Act. Because of the total number of stakeholders involved, the complexity of the inter-relationships among the stakeholders, and the incentives and constraints on those stakeholders, I conclude that an unusually high degree of coordination and cooperation among public and private entities will be required if that vision is to be realized.
- *Third*, in light of my second finding, I conclude that for the efficient, timely, and cost-effective deployment of wireless E911, there is a need for increased coordination among stakeholder groups in three areas: overall systems engineering, implementation/project management and the development and adoption of standards.
- *Fourth*, unless corrective steps are taken, I find that the rollout of wireless E911 services will continue to be constrained by what I refer to in shorthand as PSAP “fatigue,” the lack of cost recovery and other funding mechanisms, and the lack of a “champion” within the Federal government. I also conclude that, even when good faith efforts are made on all sides, PSAP awareness and readiness remains a potential detriment to the rapid and efficient rollout of wireless E911 services.
- *Fifth*, I find that the incumbent local exchange carriers (“ILECs”) play a critical role in the deployment of wireless E911 service in the reliable and seamless manner contemplated by Congress when it passed 911 Act. I also find that, in the past, the ILECs were not fully included in the development of wireless E911 and that their responsibilities for supporting wireless E911 deployment were not well defined. I further conclude that the prices charged by the ILECs for the cost of upgrading their existing wireline E911 system to support wireless E911 may impede the rollout of the

emergency service, especially in those states that do not have a cost recovery mechanism in place.

- *Sixth*, I find that (a) the lack of well-accepted, standardized tests for determining whether the various position location systems selected by the wireless carriers comply with the accuracy requirements set forth in the Commission's rules, (b) uncertainty over the interaction between delay and accuracy in obtaining position location information, and (c) uncertainty as to the area over which the test results can be averaged may cause delay in the deployment, acceptance and certification of wireless E911 systems.

In order to resolve some of the issues and concerns raised during the course of my inquiry, I have included a number of recommendations. These recommendations include suggestions that:

- The Commission should work more closely with other Federal agencies to ensure that accurate location information for emergency calls is gathered, delivered, accepted and made available for use in the dispatching of first responders. I further recommend that the Commission suggest to the Administration that a "National 911 Program Office" be established within the proposed Department of Homeland Security to coordinate with, and be a resource for, local and state public safety first responders and other stakeholders.
- Because of the importance of E911 to the safety of life and property and to homeland security and the critical nature of the network architecture and industry structure choices being made, and because of the overall complexity of the situation, I recommend that the Commission maintain or even increase its oversight of the rollout of wireless E911 services in the U.S. over the next several years.
- In order to respond to the need for increased coordination in the rollout of wireless E911 and the evolution of E911 more generally, I recommend that the Commission (a) establish, or cause to have established, an advisory committee that would address the technical framework for the further development and evolution of E911 systems and services, (b) continue to urge the creation of organizations at the state, regional and local levels of government that can act as a coordinating body in the rollout of wireless E911 services, (c) encourage the creation of a national level clearinghouse to collect, store, and disseminate status information on the rollout of wireless E911, and (d) charge the advisory committee recommended above with conducting an overall review of the standards situation as related to wireless E911 while continuing to encourage industry-based voluntary standards activities.
- Because PSAPs are on the frontlines in the Nation's defense against the threat of terrorism as well as in responding to more conventional emergencies, I recommend that the Commission actively coordinate with and support the U.S. Department of Transportation's Wireless E911 Initiative and other formal and informal efforts at all levels of government to educate state and local governments and PSAPs on the

benefits and importance of wireless E911 services. On a longer term basis, I would recommend that the National E911 Program Office (whose creation I urged above) take on the role of educating and advocating for PSAPs at the Federal level of government. I also recommend that the Commission continue to support the efforts of the Emergency Services Interconnection Forum (jointly sponsored by the National Emergency Number Association and the Alliance for Telecommunications Industry Solutions) to address the issue of PSAP readiness. In the text of the full report, I also suggest the possibility of some form of an independent third party process for certifying PSAP readiness.

- During the period of my inquiry, the Commission requested that the largest ILECs provide certain critical information regarding their readiness to carry out their role in wireless E911 deployment and committed itself to monitoring the situation to see whether additional obligations are necessary. This action is consistent with my recommendation concerning the creation of national clearinghouse of such information. I further recommend that the Commission work closely with individual state regulatory commissions and their association, the National Association of Regulatory Utility Commissioners, in resolving issues relating to ILEC cost recovery and pricing.
- The Commission should urge the stakeholders to cooperatively develop industry-wide procedures for testing and certification (and recertification) of wireless E911 to ensure that they meet (and continue to meet) the accuracy requirements specified in the Commission's rules.

Certain other issues were raised during the course of my inquiry. These other issues included concerns about the need for end-to-end testing of wireless E911 systems, conveying confidence/uncertainty information associated with position determination and routing choices, accommodating new requirements and requirement "creep," the impact of future technological developments, consumer expectations, the implications of commercial location based services, and the need for a more adaptable regulatory approach. Recommendations concerning these issues and more details regarding the recommendations recorded above are contained in the main body of the report.

## 2 History and Overall Status

### 2.1 History of Wireline 911/E911 Systems

It is widely agreed that the first-ever 911 call was placed in Haleyville, Alabama in 1968. In the early implementations of wireline 911, the processor associated with the switching machine in the local telephone company Central Office or End Office interpreted or translated the dialed 9-1-1 sequence and routed the call to a single Public Safety Answering Point ("PSAP").<sup>3</sup> A PSAP is a facility equipped and staffed to receive 911 calls.<sup>4</sup>

While this arrangement assured that a subscriber dialing the easily remembered abbreviated dialing sequence 9-1-1 would be connected to a PSAP and had the advantage of requiring little modification or additions to the LEC's network, it suffered from a number of limitations. *First*, it provided no automatic means of identifying the origin of the call (e.g., the calling number) and thus no way for the PSAP operator to identify the caller or a way to reach the caller in the event the call was disconnected (callback). Without knowing the origin of the call, there was also no way of knowing the location of the caller. This meant that the PSAP operator had to waste valuable time eliciting this information from the caller with no assurance that the caller would, in fact, be able to convey the information accurately. *Second*, the geographic area served by a telephone company End Office was (and is) unlikely to match the relevant political boundaries. For example, in some cases, there may be several political jurisdictions within the area served by the switching machines in a single End Office and, in other cases, one large jurisdiction may encompass the geographic areas served by multiple End Offices. These two situations complicate the problem of correctly and efficiently delivering the call to the proper PSAP.

The first limitation was overcome by introduction of Automatic Number Identification ("ANI"). It allowed the delivery of the calling party's telephone number along with the emergency call itself. The calling number is an example of control information and it can be carried on the signaling network (rather than the associated "conversation" or information network) if it is capable of doing so.<sup>5</sup> At the time basic 911 services were

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<sup>3</sup> The discussion which follows draws directly from an undated hardcopy of a presentation entitled "9-1-1 Tutorial" and presented by Billy Ragsdale, Bob Gojanovich, Barb Thornburg, and Roger Hixson at a NENA Technical Development Conference.

<sup>4</sup> National Emergency Number Association (NENA), *NENA Master Glossary of 9-1-1 Terminology*, NENA-01-002, March 1998. [http://www.nena.org/9-1-1/TechStandards/Standards\\_PDF/NENA\\_01-002.pdf](http://www.nena.org/9-1-1/TechStandards/Standards_PDF/NENA_01-002.pdf). (NENA Glossary)

<sup>5</sup> Besides conveying the subscriber's actual telephone message or conversation, a telephone network must also convey other information associated with setting up, disconnecting, and otherwise controlling the call itself. The transmission and reception of such control information between the customer and the network or between elements (e.g., switching machines) interior to the network is called signaling. Signaling is

introduced, the Public Switched Telephone Network ("PSTN") did not typically carry the calling number in interoffice signaling and Caller Identification services were not offered. However, the calling number was needed to properly bill for long distance toll calls and a special signaling system known as Centralized Automatic Message Accounting ("CAMA") was devised for this (billing) purpose. This system, CAMA, was adapted to deliver the calling party's telephone number to the PSAP. CAMA uses in-band, analog MF signaling and, as a consequence, suffers from significant limitations. The limitations of these legacy systems continue to hinder the provision of efficient wireline 911 services and, as we will see later, to haunt the rollout of wireless E911 systems, the subject of this report.

Since the local telephone company must, by necessity, be able to associate a particular telephone line and telephone number with the subscriber's name and address, it is possible for the network to deliver this information to the PSAP as well. The database that contains the necessary information is known as the Automatic Location Identification ("ALI") database. If the necessary modernization has occurred, it is easy to see that the processor in the End Office could query the ALI database and have delivered back the name and address to the PSAP using modern digital, common channel signaling techniques. Because of constraints imposed by the legacy analog CAMA system and legacy equipment employed in the equipment at the PSAP, this technique has apparently not been widely used. Instead, the equipment at the PSAP – known as Customer Premises Equipment or "CPE" – is connected to the ALI database over a separate data circuit.<sup>6</sup> When an incoming call is received at the PSAP, the CPE uses the calling number delivered over the CAMA network to compose and send a query to the ALI database over this data circuit. The software in the ALI database then returns the name and address of the caller thus greatly facilitating the handling of the emergency call.

Recall that the second limitation of the original basic 911 service is that a single PSAP may be responsible for a geographic area that encompasses the areas served by multiple telephone company End Offices or a single End Office may serve an area that encompasses multiple political jurisdictions. With regard to the former, just as it is often uneconomical to directly connect every End Office to every other End Office or Interexchange Carrier ("IXC") Point-of-Presence ("POP") for the carriage of ordinary telephone calls, it is often uneconomical to directly connect all end offices in a large jurisdiction to a single PSAP. Instead, the emergency calls from a number of End Offices are concentrated at a Tandem Office and then delivered over a single group of trunks to

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necessary for the establishment and control of connections – including 911 calls – through the network (e.g., the PSTN) or collection of networks (e.g., a wireless cellular network and the PSTN). It is separate and distinct from the telephone message or conversation itself. An example of signaling information would be the telephone number (network address) of the called party or an indication that the called party has "gone off hook" or answered the call. Control information is needed, for example, to route the call and to properly bill for it. The signaling network is sometimes referred to as the nervous system of the telephone network for the critical role it plays in its functioning.

<sup>6</sup> Customer Premises Equipment or CPE is a general term for the terminal equipment installed on the customer's premises that is connected to the telephone network. In the context of 911, the term CPE normally refers to the equipment used by the PSAP to receive and process 911 calls.

the PSAP. If, as in the case of the latter, there are multiple PSAPs in areas served by the End Offices subtending the Tandem Office, then some means must be provided to route the 911 calls to the proper PSAP. This additional functionality performed at the Tandem Office – referred to as Selective Routing – routes the 911 call to the proper PSAP based upon the caller's location.

The Selective Routing functionality is what distinguishes Enhanced 911 ("E911") from Basic 911. In other words, Basic 911 may or may not involve the delivery of number (ANI) and name and location (ALI) information. E911 includes the necessary network switching, database and CPE elements for delivering the voice call to the proper PSAP along with the associated ANI and ALI information. The switching machine that provides the tandem switching of 911 calls is known as the E911 Control Office.<sup>7</sup> Note that two things must happen in E911: the voice call must be routed to the correct PSAP – the one serving the geographic area where the caller is located – and the location (i.e., ALI) information must be delivered to the PSAP. In order to accomplish the first, the E911 Control Office must have access to a database, referred to as the Selective Router Data Base. The data base and associated logic maps the telephone numbers served by its subtending End Offices to the proper PSAP. This, in turn, requires the creation of a database called the Master Street Address Guide that links the street address associated with a telephone number to a particular PSAP. So to summarize, with E911, the emergency call – the conversation – is delivered via the End Office and E911 Control (Tandem) Office to the proper PSAP along with the ANI information. The proper PSAP is determined by the Selective Router through a query to the Selective Router Data Base. The CPE at the PSAP then utilizes the data link to the ALI database to retrieve the name and address information associated with the telephone number. Note that, as before, these functions could be performed more efficiently with modern digital, common channel signaling techniques that, among other things, eliminate many of the constraints associated with CAMA signaling on the trunks between the E911 Control Office/Selective Router and the PSAP.

According to the NENA Report Card to the Nation, there are approximately 190 million calls to 911 each year.<sup>8</sup> According to the same report, wireline 911 service is available to 97.9 percent of the U.S. population. However, the report goes on to note that there are over 200 counties in the United States that are without even basic 911 services. Among the population currently receiving service, the report does not distinguish between Basic 911 and Enhanced 911 services.

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<sup>7</sup> *NENA Glossary.*

<sup>8</sup> National Emergency Number Association, "NENA Report Card to the Nation: The Effectiveness, Accessibility and Future of America's 9-1-1 Service," 2001, p. 18 (available at [http://www.nena9-1-1.org/initiatives/RCN/rcn\\_final.pdf](http://www.nena9-1-1.org/initiatives/RCN/rcn_final.pdf)) (NENA Report Card to the Nation).

## 2.2 History of Wireless E911

### 2.2.1 Early Regulatory Developments<sup>9</sup>

The regulatory interest in extending E911 services to wireless mobile subscribers started when the Commission began developing rules for the broadband Personal Communications Service ("PCS") in 1993. In that proceeding, the Commission urged the industry and standards setting bodies to direct their attention to E911 access, including the automatic location of callers. In 1994, the Association of Public-Safety Communications Officials ("APCO"), the National Emergency Number Association ("NENA"), the National Association of State Nine One One Administrators ("NASNA"), and the Personal Communications Industry Association issued an "Emergency Access Position Paper" which they filed as an *ex parte* filing in the PCS proceeding. Later in 1994, representatives of the wireless telecommunications community and emergency service and public safety community convened a Joint Experts Meeting (JEM) which included representatives from various affected groups including vendors.

The outcome of this meeting was a JEM Report that included a prioritized list of PSAP service requirements, the mapping of emergency service features to evolutionary paths showing which features need to be upgraded, identification of information elements transferred between the wireless system and the emergency service system, and the identification of radio location techniques that might provide wireless ALI. According to the Commission, the JEM meeting and report did not, however, produce wireless E911 standards or any firm plan or schedule for implementing wireless E911.

Subsequently, on October 19, 1994, the Commission issued a Notice of Proposed Rulemaking<sup>10</sup> in which it proposed to require that mobile radio transmitters supplied to wireless customers provide the same level of access to 911 as available to wireline customers. Although the proceeding dealt with a wide range of issues, much of the focus was on the most crucial E911 feature; namely, the ability to report the caller's location to the PSAP. While there was general support for the goals set forth in the wireless E911 Notice of Proposed Rulemaking, the wireless industry and public safety groups differed with regard to the schedule for E911 deployment and the need for Federal regulation. Early in 1996, after the closing of the formal comment cycle, the CTIA and three national public safety organizations filed a Consensus Agreement with the Commission. The Consensus Agreement proposed a two-step implementation schedule for wireless E911. The Commission ultimately adopted rules reflecting such a phased approach for the introduction of wireless E911. Also during this period, subcommittee TR-45.2 of the

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<sup>9</sup> The initial part of this subsection draws directly from *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd. 18676 (1996) ("First E911 Report and Order and FNPRM").

<sup>10</sup> *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket 94-102, RM-8143, Notice of Proposed Rulemaking, 9 FCC Rcd. 6170 (1994) (E911 NPRM).

Telecommunications Industry Association ("TIA") and Committee TIPI, sponsored by the Alliance for Telecommunications Industry Solutions ("ATIS"), began developing technical solutions for wireless E911. These activities eventually led to the publication of joint TIA/TI standards J-STD-034 and J-STD-036.

In 1996 the Commission adopted the wireless E911 rules.<sup>11</sup> The rules established schedules for wireless carriers to provide both basic and enhanced 911 services. As explained by the Commission in the Public Notice establishing this inquiry, under those rules, PSAPs that are able to utilize E911 information must request wireless carriers to implement Phase I and Phase II E911 in order for those carriers' E911 obligations to be triggered. Under Phase I, which PSAPs could request beginning April 1, 1998, wireless carriers must provide PSAPs with a callback number and the location of the cell site/sector receiving a 911 call. Under Phase II, the wireless carriers were required to provide to PSAPs the location of all 911 calls by longitude and latitude beginning October 1, 2001. At the time the Commission adopted its original rules, it was anticipated that the wireless carriers would use network-based location technologies for meeting the Phase II ALI requirement. It established a location accuracy requirement of 100 meters for 67 percent of the calls and 300 meters for 95 percent of the calls.

Subsequently, technological advances allowed for the development of handset-based solutions. On October 6, 1999, the Commission revised its rules to accommodate these developments but, in doing so, imposed a more stringent accuracy requirement for handset-based solutions; namely, 50 meters for 67 percent of calls and 150 meters for 95 percent of calls.<sup>12</sup> It also established separate deployment schedules for network-based and handset-based solutions. Generally speaking, once a wireless carrier has received a request for Phase II service, it has six months to install the necessary equipment and begin delivering the service to the requesting PSAP. In the case of network-based solutions, the wireless carrier must provide Phase II service for at least 50 percent of the PSAP's coverage area or population with the six month period and for 100 percent of the PSAP's coverage area or population within 18 months.

### 2.2.2 Wireless Communications and Public Safety Act of 1999

On October 26, 1999, the Wireless Communications and Public Safety Act of 1999 ("911 Act") was enacted into law.<sup>13</sup> The law was enacted "to promote and enhance public safety through the use of 9-1-1 as the universal emergency assistance number, further deployment of wireless 9-1-1 service, support of States in upgrading 9-1-1 capabilities and related functions, encouragement of construction and operation of seamless, ubiquitous, and reliable networks for personal wireless services and for other purposes."

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<sup>11</sup> *E911 First Report and Order and FNPRM.*

<sup>12</sup> *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, Third Report and Order, 14 FCC Red 17388 (1999).

<sup>13</sup> Wireless Communications and Public Safety Act of 1999, Pub. L. No. 106-81, enacted Oct. 26, 1999, 113 Stat.1286.

Subsequently, the Commission initiated a proceeding to implement the Act. On August 24, 2000, the Commission adopted an order that, among other things, designated 911 as the universal emergency telephone number in the U.S., sought comments relating to the rollout of 911 services in which 911 service is not available, and sought comments on the steps the Commission might take to encourage and support States in their efforts to extend and improve their emergency communications infrastructure.<sup>14</sup>

### 2.2.3 Subsequent Commission Actions

Since the Commission adopted its original wireless E911 rules in 1996 and revised them in 1999 to accommodate the development of handset-based solutions, it has taken a number of further actions – including enforcement actions – to achieve the agency's fundamental goal of seeing wireless E911 deployed throughout the country. In a set of Orders adopted in September 2000 and October 2001, the Commission granted waivers to six major national carriers of certain of the initial Phase II deadlines, based on carrier specific Phase II compliance plans.<sup>15</sup> As part of its efforts to ensure compliance with the revised schedules, the Commission imposed detailed reporting requirements on the nationwide carriers regarding their implementation of both Phase I and Phase II services.

Also in October 2001, in response to a petition filed by the City of Richardson, Texas, the Commission amended its rules to clarify what steps need to be taken by PSAPs in order to make a valid request for Phase I and II E911 service.<sup>16</sup> In May 2001, the Chief of the Commission's Wireless Telecommunications Bureau, in response to an earlier letter from the King County (Washington) E911 Program Office, clarified the responsibility for certain network and data base costs associated with the provision of Phase I service.<sup>17</sup> In November 2001, the Commission took further steps to implement the 911 Act and, among other things, it adopted rules governing the transition to 911 as the universal emergency telephone number in those areas of the country where the 911 abbreviated

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<sup>14</sup> Implementation of the 911 Act, The Use of N11 Codes and other Abbreviated Dialing Arrangements, CC Docket No. 92-105 and WT Docket No. 00-110, *Fourth Report and Order and Third Notice of Proposed Rulemaking, and Notice of Proposed Rulemaking*, 15 FCC Rcd 17079 (2000).

<sup>15</sup> See *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, Fourth Memorandum Opinion and Order, 15 FCC Rcd 17442 (2000) (*E911 Fourth Memorandum Opinion and Order*). See also e.g., *In the matter of Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems Request for Waiver by AT&T Wireless Services, Inc.*, Order, 16 FCC Rcd. 18253.

<sup>16</sup> *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Petition of City of Richardson, Texas*, CC Docket No. 94-102, Order, FCC 01-293 (rel. Oct 17, 2001). (*City of Richardson Order*).

<sup>17</sup> See Letter from Thomas J. Sugrue, Chief, Wireless Telecommunications Bureau, to Marlys R. Davis, E911 Program Manager, Department of Information and Administrative Services, King County, Washington (May 7, 2001). See also, *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems Request of King County, Washington*, CC Docket No. 94-102, Order on Reconsideration, FCC 02-146, rel. July 24, 2002.

dialing code is not in use. It also set forth the steps it would take to encourage and support State efforts to deploy comprehensive emergency communications networks.<sup>18</sup> Recently, the Commission also addressed the issues of non-initiated handsets<sup>19</sup> and TTY compatibility.<sup>20</sup> In July 2002, the Commission reluctantly granted non-nationwide Tier II (mid-sized regional carriers) and Tier III (small carriers) temporary, limited relief from the Phase II implementation deadlines.<sup>21</sup> Summaries of the Commission's wireless E911 requirements and decisions that led to them are available on the agency's web site (<http://www.fcc.gov/enhanced/>).

#### 2.2.4 Technical Description of Wireless E911

In Section 2.1, above, I described the basic steps that must occur in delivering an E911 call on the wireline network. A similar set of things must happen in handling a wireless E911 call. Basically, four things have to happen: the subscriber has to be located, the PSAP serving that location must be determined, the voice conversation has to be routed to that PSAP and finally the callback number/mobile directory number and location information must be delivered to the PSAP. As I indicated before, in the wireline environment, an ordinary telephone number is associated with a particular line (local loop) that serves a particular physical address. While the telephone number associated with a particular loop serving a given address may change from time-to-time (e.g. when subscribers move) the associated data bases are comparatively static. This is clearly not the case with mobile wireless where the location of the customer may be continuously changing even within the duration of a single call.

Recall that in Phase I, the location information is simply the cell site/sector receiving a 911 call. In Phase I implementations, a set of unique pseudo telephone numbers is assigned to each cell site/sector. In a mobile wireless network, the equivalent of a wireline carrier's End Office is known as a Mobile Switching Center ("MSC"). When a MSC receives a 911 call, a processor associated with the switch knows the cell site/sector where the call is coming from and selects an unused pseudo telephone number from the set associated with the cell site/sector. The MSC then forwards the call and pseudo telephone number to the E911 Control Office. The Selective Router Data Base contains

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<sup>18</sup> Implementation of the 911 Act, The Use of N11 Codes and other Abbreviated Dialing Arrangements, *Fifth Report and Order* CC Docket No. 92-105, *First Report and Order* WT Docket No. 00-110, *Memorandum Opinion and Order on Reconsideration* CC Docket No. 92-105 and *Order* WT Docket No. 00-110, FCC 01-351 (2001)

<sup>19</sup> *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Non-Initialized Phones*, CC Docket No. 94-102, Report and Order, FCC 02-120 (rel. April 29, 2002). Non-initialized handsets are those phones for which there is not an existing service agreement.

<sup>20</sup> *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, Order, FCC 02-1540 (2002).

<sup>21</sup> See *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems Phase II Compliance Deadlines for Non-Nationwide CMRS Carriers*, CC Docket No. 94-102, Order to Stay, FCC 02-210, rel. July 26, 2002.

information that associates the pseudo telephone number (and its associated cell site/sector) with a particular PSAP. The E911 Control Office or Selective Router then forwards the call with the pseudo telephone number to the PSAP's CPE. When the MSC forwards the call to the E911 Central Office, the associated processor also sends (or "pushes") the call back number of the mobile unit and Phase I location information to the ALI data base. When the PSAP's CPE receives the call and pseudo telephone number from the E911 Control Office it queries the ALI data base using the pseudo telephone number and receives in return the call back number and cell/site sector information. The call back number and location information is then displayed to the dispatcher.<sup>22</sup>

Before I turn to Phase II implementations, two observations are in order. First, because of the use of pseudo telephone number, the existing E911 infrastructure can be used for Phase I implementations with minimal or no modifications. The pseudo telephone number is simply substituted for the ANI information and everything else essentially operates as it did for wireline E911. This is not the case with Phase II implementations. Second, as noted before, these functions could be performed more efficiently with modern digital, common channel signaling techniques that eliminate many of the limitations associated with CAMA signaling. Stated more directly, the wireline E911 system, while reliable, was jury-rigged upon a dead-end CAMA technology that continues to constrain the evolution of wireless E911 service.

In Phase II, the wireless carrier must deliver the callback number and the location (latitude and longitude or "XY" coordinates) of the caller. As I will discuss in more detail later, much of the early activity in wireless E911 was associated with discovering/inventing, developing, evaluating and selecting methods for locating mobile units to meet the Phase II requirements. Broadly speaking, there are two basic types of solutions – network-based solutions and handset-based solutions. In the case of network-based solutions, receivers at known locations (i.e., at base stations) measure the direction or, more typically, the time of arrival of the signal emitted by the mobile unit. In the case of the latter, having a timing reference and knowing the speed that the radio signal travels is a constant (i.e., the speed of light), it is possible to estimate the range of the mobile unit from the base station. With three base stations at known locations making the measurements, it is possible to unambiguously estimate the location of the mobile unit. There are many refinements to this basic triangulation technique including using combinations of angle-of-arrival (direction) and field strength, for example. Systems like this are referred to as network-based solutions for the rather obvious reason that the measurements and calculations are done in the network.

In a handset-based solution, the situation is reversed with the handset making the measurements and the calculations. In one approach, the handset measures the time of arrival of signals transmitted from Global Positioning System ("GPS") satellites and uses a similar triangulation techniques to calculate its position. In the most commonly used

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<sup>22</sup> The description contained in the paragraph is intended to be illustrative only. The description generally reflects what is called the Non-Call Path Associated Signaling ("NCAS"). Other solutions include Call Associated Signaling ("CAS") and Hybrid CAS.

approach, some of required processing is actually carried out in the network to improve the performance of the system. The system I am referring to is known as Assisted GPS ("A-GPS"). Likewise, another commonly used approach, known as Enhanced Observed Time Difference of Arrival ("E-OTD"), is regarded as a hybrid system because the required measurements are distributed between the handset and the network.

The delivery of the location or XY information to meet the Phase II requirements is more complicated than the delivery of Phase I information. It is more complicated for several reasons. First, unlike the cell site/sector information, the geographic coordinates may not be immediately available because of the time it takes to perform the required measurements and calculations. Second, the amount of information to be transferred (the geographic coordinates and, possibly, confidence information) is greater and, third, the location data may need to be refreshed during the call in order to improve the accuracy or to follow a caller that is moving. Because the existing, underlying E911 network is typically unable to carry the additional information due to constraints in the signaling network or Selective Router or to handle refresh requests and responses, a separate data link and interface is required between the ALI data base and wireless carrier's Mobile Positioning Center ("MPC"). Implementation of this data link requires selection and installation of an interface and various data base upgrades.

Although the details vary depending upon the capabilities of the legacy network elements and the interface or interfaces chosen, call processing in Phase II implementations is similar to that described for Phase I since the same basic steps are required. When a wireless carrier's MSC receives a 911 call, the Position Determination Equipment ("PDE") locates the mobile terminal either at the start of the call or while the call is in progress. The MPC uses the XY coordinates to interrogate a Coordinate Routing Data Base ("CRDB"). The CRDB returns the information necessary to forward the call to the proper E911 Control Office or Selective Router. The MSC forwards the call and Phase I pseudo telephone number to the E911 Control Office. The E911 Control Office uses the information stored in the Selective Router Data Base to deliver the call and pseudo telephone number to the proper PSAP. When the MPC locates the mobile terminal, it also pushes the pseudo telephone number, call back number and location information (XY coordinates) to the ALI data base over the separate data link. When the PSAP's CPE receives the call and pseudo telephone number from the E911 Control Office or Selective Router, it queries the ALI data base using the pseudo telephone number. The ALI data base returns the call back number and Phase II location information which is then processed and made available to the dispatcher. Note that during the call, the location information can be refreshed over the data link between the MPC and the ALI data base.<sup>23</sup>

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<sup>23</sup> As in the case of the Phase I, the description contained in this paragraph is intended to illustrative only. The details vary depending upon the protocols chosen and other factors. The process described assumes routing based upon the Phase II information but routing on Phase I information is also possible as described in Section 4.2 below

**Subject: RE: here's the agenda**

**Date:** Tue, 20 Apr 2004 17:10:14 -0800

**From:** "Becky Gay" <bgay@aidea.org>

**To:** "Mary Siroky" <Mary\_Siroky@Legis.state.ak.us>

Mary, Somehow I already lost the agenda! Can you send it again and I am requesting a change of order to accommodate Robert Wilkinson, as noted below. Thanks again for the excellent opportunity.

On Bridge:

Task Force members to present:

Robert Wilkinson: 822-3211 CEO, Copper Valley Electric (Agenda change: This presenter needs to be right after Tom Boutin since it turns out he has to drive up to Lake Louise same morning for his Board meeting and should leave by nine a.m. He will speak briefly on SouthCentral Coastal area needs.)

Other Task Force members:

Wayne Carmony: General Mgr. Matanuska Electric 761-9211

Rick Eckert, Finance Mgr. Homer Electric 235-3353

Steve Haagenson, President/CEO, Golden Valley Electric 452-1151

Staff, Bernie Smith AEA 269-4643

Remember, our Chairman Mike Barry is trying to make it in the night before, but doesn't look promising. He would be on teleconference, but he is on the plane down at same time. If you need to see him face-to-face afterward, please let us arrange that! Becky

-----Original Message-----

From: Mary Siroky [mailto:[Mary\\_Siroky@Legis.state.ak.us](mailto:Mary_Siroky@Legis.state.ak.us)]

Sent: Tuesday, April 20, 2004 4:43 PM

To: Becky Gay

Subject: Re: here's the agenda

Becky I need the names and number of folks who want to be on the bridge and I will get them added.

mary

Becky Gay wrote:

> Mary, That looks great! Also, I would like to have the other members  
> of the Task Force on the bridge if that is okay, since they may want  
> to weigh in or answer questions. That is the same list we were using  
> to get titles, fyi. Can I also have a bridge access for AEA here, so  
> staff can be on standby for PCE detail, etc. Bernie Smith also helped

> with the Task Force, so he will be on standby as well. Thanks for  
> sending me the right number and setting up the opportunity. Becky

>

> -----Original Message-----

> From: Mary Siroky [mailto:[Mary\\_Siroky@Legis.state.ak.us](mailto:Mary_Siroky@Legis.state.ak.us)]

> Sent: Tuesday, April 20, 2004 3:50 PM

> To: Becky Gay

> Subject: here's the agenda

### Summit Telephone Company

Both Cleary Summit and Chena Hot Springs have a Special Access DSO circuit into the Fairbanks Northstar Borough E911 system. We provide an alternate route to an 800# that goes to the Alaska State Troopers in Fairbanks.

Coldfoot has no E911 access, we route all 911 calls to the 800# at AST in Fairbanks.

### Bristol Bay Telephone Co-op

We don't have access to a psap in any of the 7 communities we serve.

### United Utilities

75 cents per month per line in Bethel

### Ketchikan Public Utilities

All of our customers have access to the local PSAP which is in Ketchikan. Just for the record, we are required by the Ketchikan Municipal Code to charge a \$.75 per line E911 charge to our customers and remit to the local PSAP.

Dan

### Cordova Telephone Co-op

We do not collect anything for our PSAP in Cordova. I suspect the day will come the City will ask, they had visited this issue a few years ago, but were going after grant money to fund their 911 system, I don't believe they ever received the money.

### Copper Valley Telephone Co-op

Your questions are easy, as with most of these issues the answers are much more difficult. The devil is always in the details!

CVTC has 6,200 access lines spread over 9,400 square miles in six (6) exchanges. Valdez with its 3,400 lines will start applying a .75 cent surcharge in May for its local PSAP. Question, should this group or others who are already paying for a local PSAP pay for a statewide toll free PSAP.

Regarding our remaining 2,800 CVTC lines, should they be required pay 2-5 cents per line per month for the ability to hear a live person on the other end of a 911 call? For calls placed from Mentasta 107 miles from Glennallen, McCarthy an 1 1/2 air taxi ride or a 3 1/2 hour drive

from Glennallen, Chitina 45 minute drive from Glennallen or Tatitlek a 45 minute ride by air taxi or a 2 1/2 hour trip by boat from Valdez, is there a value for that? I'm not sure!

At some level there is but if it truly is an emergency, house on fire, heart attack, gun shot wound. I'm not sure the PSAP will be able to provide a lot of help.

The 911 calls from the above exchanges (not Valdez) are currently routed to Glennallen State Troopers when the office is occupied. When the office is not occupied the calls are routed to Fort Rich. It's my understanding that at times the calls are routed to a recorded announcement. I'm not sure how many 911 calls from these communities we currently route to the Troopers. ✓

With respect to costs for routing calls, if it were set up on an 800 call basis through either AT&T or GCI they should be able to give you a better idea on costs. They may be able to give you a flat rate, per minute or per call quote. Mary Laird at GCI or Elisabeth Parks at AT&T? ✓

Apologize for the long answer!

Tim

**Alaska Power & Telephone** *Jim Harper*

I'm going to double check but in our remote locations we route them LD to the nearest trooper station... the same as other telco's would have to do... again I'll double check but that is my recollection... it has been over 5 years since I've dealt with that issue... ✓

EVERY location we serve routes a 911 call to some authority, be it the local PD or routed to closest state trooper office. Yes, these are not E911 calls (E911 uses a database to know who the caller is and GIS systems to locate the caller) but in most rural areas E911 isn't practical, there are no maps or even street address. ✓

✓ Only one community we serve is attempting to get a PSAP and that is Wrangell. We might remind others that many communities are eligible for aid from homeland security and those funds can cover E911. See this link.

[http://www.sitnews.us/0404news/041304/041304\\_ketchikan\\_security.html](http://www.sitnews.us/0404news/041304/041304_ketchikan_security.html)

# Alaska State Legislature



**Representative Cheryll Heinze**

TO: Representative *Carl* Morgan, Chairman  
House Community & Regional Affairs Committee

DATE: February 20<sup>th</sup>, 2004

I would request that you schedule HB <sup>499</sup>453 for a hearing before your committee.

Enclosed are:

1. HB 499
2. Sponsor Statement
3. NENA July, 2003 Report on Range of 9-1-1 Surcharges
4. Excerpts from the FCC's Sept. 2002 Hatfield Report

An expanded committee packet will be delivered to your office as soon as it has been finished.

Sincerely,

A handwritten signature in cursive script that reads "Cheryll Boren Heinze".

Representative Cheryll Boren Heinze

# FISCAL NOTE

**STATE OF ALASKA**  
**2004 LEGISLATIVE SESSION**

Fiscal Note Number: \_\_\_\_\_  
 Bill Version: HB 499  
 ( ) Publish Date: \_\_\_\_\_

Revision Date/Time (Note if correction): \_\_\_\_\_ Dept. Affected: DCED  
 Title 911 Systems RDU Regulatory Commission of Alaska (399)  
 Component Regulatory Commission of Alaska  
 Sponsor Representative Heinze  
 Requester House Community & Regional Affairs Component No. 2417

**Expenditures/Revenues** (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
<b>TOTAL OPERATING</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

<b>CAPITAL EXPENDITURES</b>						
-----------------------------	--	--	--	--	--	--

<b>CHANGE IN REVENUES ( )</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
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**FUND SOURCE** (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
1141 - RCA Receipts						
<b>TOTAL</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

Estimate of any current year (FY2004) cost: 0.0

Mark this box (X) if funding for this bill is included in the Governor's FY 2005 budget proposal:

**POSITIONS**

Full-time	0	0	0	0	0	0
Part-time						
Temporary						

**ANALYSIS:** (Attach a separate page if necessary)

The RCA interprets this legislation to require it to adopt generally accepted industry standards for multi-line telecommunications systems. This aspect can be undertaken as part of the Commission's regular work load. If it is the intent of the Legislature that the Commission would be responsible for ensuring compliance with the standards, then some fiscal impact could arise.

Prepared by: Mark K. Johnson, Commissioner, Chair Phone (907) 276-6222  
 Division Regulatory Commission of Alaska Date/Time 2/27/04 5:37 PM  
 Approved by: Edgar Blatchford, Commissioner Date 2/27/2004  
 Agency Department of Community & Economic Development

# Alaska State Legislature

House Special Committee on Economic Development; International Trade & Tourism  
REPRESENTATIVE CHERYLL BOREN HEINZE, CHAIR

## SESSION

State Capitol  
Juneau, Alaska 99801-1182  
(907) 465-4930 Tel  
(907) 465-3834 Fax

## INTERIM

716 W. Fourth Ave.  
Anchorage, Alaska 99501-2133  
Tel (907) 269-0160  
Fax (907) 269-0177

## Sponsor Statement HB 499

### “An Act relating to 911 systems”

HB 499 is designed to modernize Alaska's 911 statutes to help bring us into line with Federal mandates. The bill makes three necessary changes to current statutes: it modifies surcharge limitations, makes the Governor responsible for certification and collection of surcharges, and ensures that all emergency calls get routed through an appropriate public safety answering point.

HB 499 would change municipalities' cost recovery options in regards to their 911 systems. Currently most municipalities are absorbing some of the costs of upgrading and maintaining their 911 facilities because the surcharge caps are too low to cover the expense. HB 499 would increase the surcharge limit to \$2.00 a month for both wire line and wireless users allowing municipalities to spread the cost evenly among phone users.

This bill also makes minor changes in the amount of surcharges paid by wire line customers with more than 100 local exchange lines, prepaid wireless customers and municipalities with a population of 100,000 people or more to make sure the surcharges are spread out more equitably.

HB 499 would provide for transitional cost recovery for both Phase I and Phase II Enhanced 911 (E-911) service as allowed under FCC proceedings entitled “Revision of the Commission's Rules to Ensure Compatibility with Enhanced 9-1-1 Emergency Calling Systems.” (CC Docket No. 94-102; RM-8143).

This legislation also acknowledges issues associated with multi-line telecommunications system operators and the responsibilities associated with 911 call routing. It further mandates that all wire line instruments used to originate a 911 emergency call be routed to a Public Safety Answering Point.

Finally, changes to current Alaska statutes would make the Governor responsible for certifying the collection and use of all 911 surcharges. This will allow municipalities the opportunity to make applications for federal grants to upgrade their 911 systems and mitigate some of the costs associated with this essential service. This legislation is necessary to provide the quality of emergency response services that Alaskans deserve, which is why I strongly urge your support of this bill.



**COMMITTEE: House  
Community and Regional  
Affairs Standing Committee**

**SUBJECT:  
HB 461-EMERGENCY SERVICES  
DISPATCH/911 SURCHARGE**



DATE: March 2, 2004

# PLEASE SIGN IN

PLEASE PRINT:  
NAME & TITLE

ADDRESS

PHONE

REPRESENTING

(No acronyms unless for a state agency,  
please)

DO YOU  
WANT TO  
TESTIFY?

Mark Johnson, Chief Community Health & EMS	P.O. Box 110616 Juneau, AK 99811-0616	465-5035	Dept. of Health & Soc. Services	Yes
E-mail address:	mark_johnson@health.state.ak.us			
Kevin Rutchie	217 2nd St	5861325	AK Power League	yes
E-mail address:				
Alexander Wochman	224 4th St. S.W.	523-3200	GLB	
E-mail address:				
E-mail address:				
E-mail address:				



