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BEFORE THE
Federal Communications Commission
WASHINGTON, D.C.

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| In the Matter of |) | |
| |) | |
| Revision of the Commission's |) | CC Docket No. 94-102 |
| Rules To Ensure Compatibility |) | RM-8143 |
| with Enhanced 911 Emergency |) | |
| Calling Systems |) | |

REPORT OF CTIA, PCIA, APCO, NENA, NASNA, ALLIANCE

The Cellular Telecommunications Industry Association ("CTIA"), Personal Communications Industry Association ("PCIA"), Association of Public-Safety Communications Officials-International, Inc. ("APCO"), National Emergency Number Association ("NENA"), National Association of State Nine One One Administrators ("NASNA"), and the Ad Hoc Alliance for Public Access to 911 ("Alliance")¹ respectfully

¹ CTIA is the international organization of the wireless communications industry for both wireless carriers and manufacturers. Membership in the association covers Commercial Mobile Radio Service ("CMRS") providers and manufacturers. PCIA is the international trade association representing numerous segments of the wireless industry. PCIA's members include PCS licensees and those in the cellular, paging, ESMR, SMR, mobile data, cable, computer, manufacturing and local and interexchange sectors of the industry, as well as technicians, wireless systems integrators, communications site owners, distributors, service professional and private corporate system users. APCO International is a not-for-profit professional organization dedicated to the enhancement of public safety communications. APCO International represents the people who manage, operate, maintain, and supply the communications systems used to safeguard the lives and property of citizens worldwide. NENA is a non-profit organization which fosters the technological advancement, availability, and implementation of a universal emergency telephone number system. In carrying out its mission, NENA promotes research, planning, training and education. NASNA is an organization composed of state 9-1-1 directors and program

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submit this joint report on the status of certain issues regarding access to wireless E 9-1-1.²

In its Report and Order, the Commission requires the above mentioned parties to report jointly to the Commission on the status of (1) the development of the technical and operational standards necessary to implement and enable widespread wireless access to emergency services,³ (2) the development of common channel signaling,⁴ and (3) the industry's progress in developing a "grade of service" standard for 911 service.⁵ This Report was developed by the Parties via the Wireless E 9-1-1 Implementation Ad Hoc ("WEIAD")⁶ and addresses the issues delineated by the

administrators. The Alliance membership includes representatives from various consumer groups. The signatories to this Report will hereafter be referred to as the "Parties".

² See In the Matter of Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Report and Order and Further Notice of Proposed Rulemaking, CC Docket No. 94-102, RM-8143 (released July 26, 1996) ("911 Report and Order").

³ 911 Report and Order at ¶ 73.

⁴ 911 Report and Order at ¶ 132. The Commission defines common channel signaling as "a network architecture supported by numerous protocols." Id. at n.264.

⁵ 911 Report and Order at ¶ 125. The Commission defines "grade of service" as "the percentage of calls between the mobile transmitter and the PSAP that are blocked either within the radio or the wireline network." 911 Report and Order at ¶ 120.

⁶ The WEIAD is a group consisting of representatives from the wireless industry, the public safety community and consumer groups, including the required signatories to this Report. In an effort to jointly produce this status Report, the WEIAD met on several occasions, known as WEIAD-1, WEIAD-

Commission. Additionally, this Report provides a summary of recent activities regarding call-back and the "strongest signal" proposal. The parties also have included references to funding, liability, and other legislative issues.

I. TECHNICAL AND OPERATIONAL STANDARDS AND COMMON CHANNEL SIGNALING

The Commission requires the Parties to report annually on "the status of the discussions, what decisions have been made, and what can be done to expedite resolution of the issues."⁷ Additionally, the Commission required that the Parties "furnish the Commission with reports detailing the status of the issues involving the interfaces and signalling systems to be deployed for E911 services, what decisions have been made by standard bodies or through mutual agreement among the interested parties, and what can be done to expedite the resolution of the issues."⁸ The Report and Order referred generally to the development of technical and operational standards by Committee T-1 of the American National Standards Institute ("ANSI") and Committee TR45.2 Ad Hoc on Wireless Emergency Services ("TR45.2") of the Telecommunications Industry Association ("TIA").

Phase 1. TR45.2 represents all providers of Commercial Mobile Radio Service ("CMRS") emergency services. With the

2, and WEIAD-3. Formal minutes of these meetings are available upon request.

⁷ 911 Report and Order at ¶ 75.

⁸ Id. at ¶ 132.

support of NENA, APCO and NASNA, this committee has developed a standard, J-STD-034, to assist in meeting the Phase 1 requirements of the Report and Order: to relay to a designated PSAP the 9-1-1 wireless caller's telephone number ("ANI") and the location ("ALI") of the cell site/sector or base station receiving that call. J-STD-034 is classified as a joint TIA Interim Standard and a Trial Use Standard of the Alliance for Telecommunications Industry Solutions ("ATIS").

The Phase 1 standard contemplates two methods of interconnection of the wireless and wireline networks:

1. An Enhanced Multi Frequency ("EMF") protocol based on the existing Feature Group D signaling; or
2. Enhancements to Signaling System 7 ("SS7") Integrated Services Digital Network User Part ("ISUP") Initial Address Message ("IAM") protocols.

The NENA Technical Committee has developed a parallel EMF protocol document, NENA-03-002, governing the passing of the callback number and the cell/sector location information from the selective router -- usually a wireline telephone company switch -- to the PSAP. The NENA committee is continuing to work on defining the ISUP protocols necessary for passing ANI and ALI from the router to the PSAP.

Phase 2. TR45.2 also has begun initial work on the Phase 2 requirement to transmit location coordinates. The Phase 1 cell site/sector information would remain as a "default" in the event of failure to transmit the Phase 2

information. Two methods are under study for conveying location coordinates:

1. Including this information in the IAM of the SS7 ISUP; or
2. Non-call path signaling to accomplish the same task.⁹

It is important to bear in mind that this is an information processing standard meant to be technology-neutral and capable of transmitting location data from several possible sources: terrestrial carrier network, satellite network, handset, or third-party vendor. TR-45.2's schedule is to complete its work in early 1999.

II. GRADE OF SERVICE

Our discussions indicate that wireline companies typically perform at -- or are upgrading their systems to achieve -- a grade of service ("GOS") of one busy signal per one hundred 9-1-1 call attempts during the average busy hour of the week (P.01). It was agreed that this is an acceptable grade of service.

Grade of service was not a part of the Consensus submission by CTIA and the public safety organizations in late 1995. The wireless industry generally contended that carriers have incentives to keep the percentage of blocked

⁹ Some vendors are employing non-call path methods to pass the 17-20 digits of Phase 1 ANI and ALI where so-called "CAMA" trunking in the wireline network limits capacity to 8-10 digits.

calls low and that additional competition -- PCS and SMR, besides cellular -- would only increase those incentives. Public safety organizations feared degradation of what normally has been a P.01 grade of service in the wireline network. In its 1996 Order, the Commission agreed with carriers that federal GOS standards were not yet warranted, but proposed to keep informed on wireless network quality.¹⁰

For CMRS service, both the radio and the trunk side need to be considered for GOS. The present grade of service on the radio side is unknown, and some consider it difficult to measure consistently given the mobility of wireless users. In engineering GOS in the trunk side, P.01 between the PSAP and the carrier is the normal standard. However, carriers do not expect to achieve this in "spike" calling, such as multiple reports of traffic accidents, fires, explosions and other disasters that prompt "Good Samaritans" to summon help. While such overloads also can occur in the wireline network their location and duration are usually easier to predict than in the wireless network.

The Alliance stated that a recent study in Los Angeles came up with a GOS of P.16 or worse. Furthermore, the Alliance indicated that, while typically less expensive analog radio service is being heavily promoted for safety purposes, the wireless industry is, at the same time, reallocating channels from analog to digital service. The

¹⁰ 911 Report and Order at ¶ 124.

Alliance expressed concern that this reallocation of channels may cause further reduction in the grade of service available to these users. Industry representatives, however, pointed out that conversion to digital typically conserves and extends available spectrum, thereby improving wireless carriers' GOS. Moreover, industry representatives claim that there is no evidence that analog spectrum is shrinking faster than the number of analog users or that analog service necessarily is priced differently from digital service. Apart from the Alliance offer of the results of the Los Angeles study, no empirical data was presented concerning current grades of service for wireless communications.

Besides the problem of "spike" calling discussed above, wireless call completion may be affected by local governmental restrictions which limit the number of cell sites in a given area. Short of limiting the number of subscribers, which is impractical, the following suggestions were offered for further consideration: (1) 9-1-1 call priority, (2) minimal "choking" of cell site surges of 9-1-1 calls, and, (3) relief from antenna site restrictions.

WEIAD-2 suggested the report to the FCC focus, at this time, on the network side of the mobile switch. For the most part, wire telephone companies leave to the wireless carriers the determination and ordering of trunk capacity to connect the mobile switch to the public switched telephone network. We know of one large LEC, and there may be others,

that asks for a minimum of two DSO trunks from competitive wireline carriers, shared tenant service providers and wireless carriers. The LEC applies this policy uniformly out of concern for the anti-discrimination provisions of the 1996 amendments to the Communications Act.

We are advised that the adequacy of the mobile switch-to-PSTN trunking can be tested relatively simply by wireless carriers. Traffic statistics and reports are standard with every switch on the market. The carriers can collect statistics on every trunk group they have, including peg counts (number of calls), overflows (number of "busies") and holding times.

Wireless carriers may not be collecting statistics specific to 9-1-1 calls, since 9-1-1 is typically translated to another number and sent to the PSTN like any other call, but they are believed to be capable of doing so. Presumably, they monitor the traffic on their access trunks. If dedicated 9-1-1 trunk groups are established, the collection of traffic statistics would become routine.

III. STRONGEST SIGNAL PROPOSAL AND CALL BACK PROPOSAL

Although the Commission did not request a formal report on the Alliance's strongest signal proposal and the issues surrounding call-back, the Parties, via the WEIAD, have engaged in in-depth discussion of these issues. As a result, the WEIAD has produced draft reports on each of

these topics. Those reports are included as Appendices A and B for the Commission's review.

IV. FUNDING, LIABILITY AND OTHER LEGISLATIVE ISSUES

Legislative activity and interpretation regarding these issues is constantly evolving. The following are descriptions of two possible resources on these topics.

XYPoint, Inc. is a vendor of wireless E9-1-1 services that has tracked and tabulated legislative activity in the states in funding, PSAP and carrier liability, and other issues bearing on the implementation of wireless emergency call information and routing. They provide state-by-state analyses of state 9-1-1 surcharges, wireless 9-1-1 cost recovery, and wireless 9-1-1 limitation of liability laws ("wireless indemnity"). This information can be viewed at the company's website, www.xypoint.com.

For its part, NENA has attempted to post much of this legislative material for convenient Internet access. Currently, 27 states are in the database, and 26 of these have links to the text. Augmentation and updating continue. The home page is addressed at www.nena9-1-1.org, and the specific site for state law is:
www.nena9-1-1.org/nrc/wireless/wirefrnt.htm .

Respectfully Submitted,



Michael F. Altschul
Cellular Telecommunications
Industry Association



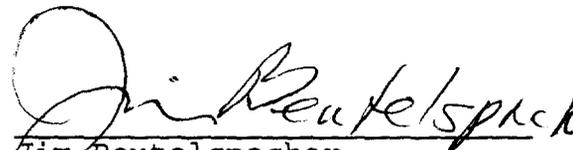
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Personal Communications
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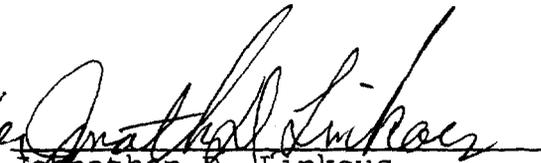
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January 30, 1998

APPENDIX A

WEIAD SUMMARY DISCUSSION ON STRONGEST SIGNAL

Coverage "holes" will always exist in one form or another due to the very nature of radio communications. A wireless telephone user who is located in such a hole may find that there is no signal or insufficient signal to establish and maintain adequate communications over the wireless system accessed by the handset. There is agreement that in these instances, a user should be able to attempt access to an alternate, technically compatible, system for 9-1-1 calls.

In the case of no signal from the preferred system, there is agreement that programming a purely analog handset to use A over B or B over A may alleviate the problem. Two proposals were considered. The first is based on the premise that the user should always be able to access the strongest channel when placing a 9-1-1 call. The second proposal is that all handsets be programmed to use A over B or B over A logic when 9-1-1 is dialed, at a minimum. Among the proposals presented but not fully explored was establishing minimum signal strength levels as a trigger for the handset to switch systems.

The Strongest Signal and A over B proposals are not mutually exclusive. It was agreed that the user should always be given the choice between viable alternatives. There was concern by some participants that the Strongest Signal proposal, favored by the Alliance, may not be desirable, technically feasible, or sufficient. The Alliance position is that more than significant opportunity has been afforded through the FCC comment period for such objections to be stated and supported.

The WEIAD desires the best means to ensure the completion of 9-1-1 calls. As one avenue of exploration, Public Safety and the Wireless Industry suggested that the WEIAD request the appropriate Standards Development Organization (SDO) to expeditiously consider the Alliance proposal. The Alliance does not believe that such a reference is appropriate because it maintains that its petition does not seek a change in the existing standard, or in the interoperability "standards" or "common air Interfaces" that have been established. The other parties disagreed with this position and maintained that the SDO itself should determine if the Alliance proposal requires a change in an existing standard or the establishment of a new standard.

A two track approach which contemplated endorsement of prompt consideration of the Alliance proposal by the FCC and the SDO was not acceptable. However, the Wireless Industry and the Public Safety organizations agreed to assist the Alliance in expediting the SDO process in order to reduce the time for the SDO to consider the Alliance proposal. The WEIAD recognizes the Alliance will

continue to urge the FCC to rule on its petition. The Alliance agrees that it will take under advisement the suggestion that it submit its proposal to the appropriate SDO for consideration.

I. The WEIAD-3 recommends that the wireless industry promptly begin to undertake to educate users of purely analog phones manufactured or provisioned prior to mm/dd/yy(earliest practical) on the capabilities of those phones to be programmed, where capable, to use A over B or B over A logic as prescribed by EIA/TIA 553* for 9-1-1 calls.**

II. The WEIAD-3 recommends that all purely analog phones manufactured or provisioned after mm/dd/yy(earliest practical) be programmed, where capable, to use A over B or B over A logic as prescribed in EIA/TIA 553* for 9-1-1 calls, at a minimum; with the proviso that users can elect to stay on their preferred carrier.

* Paragraph 26.1.1.2

**Implementing this logic will apply to all calls

Recommendation III represents the consensus of the WEIAD. The Alliance does not concur with this recommendation.

III. The WEIAD desires the best means to ensure the completion of 9-1-1 calls. As one avenue of exploration, the WEIAD remands to the appropriate SDO¹¹, for expeditious consideration, the AD HOC Alliance proposal that all purely analog phones manufactured or provisioned after (earliest possible date) be programmed, where capable, to scan all of the forward control channels assigned to both system A and system B and select and use the channel with the strongest compatible signal whenever a 9-1-1 call is placed, with the provision that the user be able to disable this feature.

To advance the achievement of this capability, the Wireless Industry and Public Safety organizations agree to assist the Alliance in creating a requirements document for consideration by the appropriate SDO.

(see attached SRD)

¹¹ In the event that a problem is identified but no solution is known or available to be offered for review, a mechanism exists in the form of a Standards Requirements Document (SRD). This document describes the problem and defines the elements required to address the problem. It is submitted to the appropriate Standards Development Organization (SDOs) and contributions are made by the members in an effort to craft solutions.

When a proposed solution exists, the process has long been established to review the technical validity and merit of any party's proposal. In this case, the proposal would accompany the SRD. The submission of an SRD is the first rung of the ladder.

Public Safety Organizations (PSOs) offered to assist the wireless industry to help shepherd the Alliance's proposal through an SDO process. Additionally, the PSOs and the wireless industry helped draft such a document for the Alliance. The draft SRD was offered to the Alliance for submission to the SDO process.

*****DRAFT** Standards Requirement Document (SRD)**

*****DRAFT** For Improved 9-1-1 Access**

(SRD prepared by Synacom Tech)

Statement of Problems

Even though wireless 9-1-1 service is generally adequate and reliable, it may be improved by attempting to access radio interfaces available to a mobile station that may be precluded by mobile station preferences programmed in mobile stations. Generally it is desirable for the mobile station to access the air interface that is preferred to that mobile station since that air interface has been selected by the user, the service provider, or both. However, it is also recognized that the mode and band preferred by a mobile station may not have adequate channels available in all areas. When a user is attempting to access emergency services (e.g., by dialing 9-1-1) and maintenance of an adequate preferred channel is not possible, access to the other bands and modes available to the mobile station should be attempted.

Additionally, 9-1-1 is now allowed from mobile stations that have not been service activated (or which are operating with a personal identity module removed). To spread emergency service requests to all wireless service providers, mobiles that have not been service activated should access the compatible wireless systems on an equal basis (i.e., do not be presupposed to the lower frequency bands available).

Immediate Requirements:

Allow mobile stations to allow access all bands and modes offered by the phone.

Allow non-activated mobile stations at the factory to access to 9-1-1 on a non-discriminatory basis for all bands available to the mobile station (e.g., use both odd and even factory default SIDs on cellular mobile stations)

Possible solutions:

Balanced factory programming of SID for A and B side cellular carriers.

Factory programming of system selection preference for all available bands.

Possibly add a separate system preference for emergency service access.

Long Term Requirements:

Do no [minimal] harm for the existing call processing.

For emergency service calls (9-1-1):

- access an available voice channel expeditiously
- on any band or mode available to the phone
- that allows the caller to clearly communicate with the 9-1-1 call taker.

Delay the call minimally (e.g., 2-5 seconds)

Seek the clearest available voice channel.

Do not get stuck. Attempt alternate accesses if radio contact cannot be maintained on a particular access channel.

Provide an access that is better than normal access (e.g., clearer, more reliable, better access probability).

Possible solutions

Seek "strongest" or "best" available control channel.

Seek "best" available voice channel.

Attempt different mode or band on emergency call failure.

APPENDIX B

REPORT TO WEIAD - 3 Callback Working Group January 6 & 7, 1998 Phoenix, AZ

The Callback Technical Workshop met to review the issues related to providing "Callback" for 9-1-1 calls. Discussion centered on the precise definition of the problem and possible solutions. Consideration of the FCC Memorandum Opinion and Order, 97-402 released December 23, 1997 guided the focus of the decision making process for the Workshop. The following report captures the definition of the problem and possible courses of action as well as relevant issues and concerns discussed by the group.

I. DEFINING THE PROBLEM

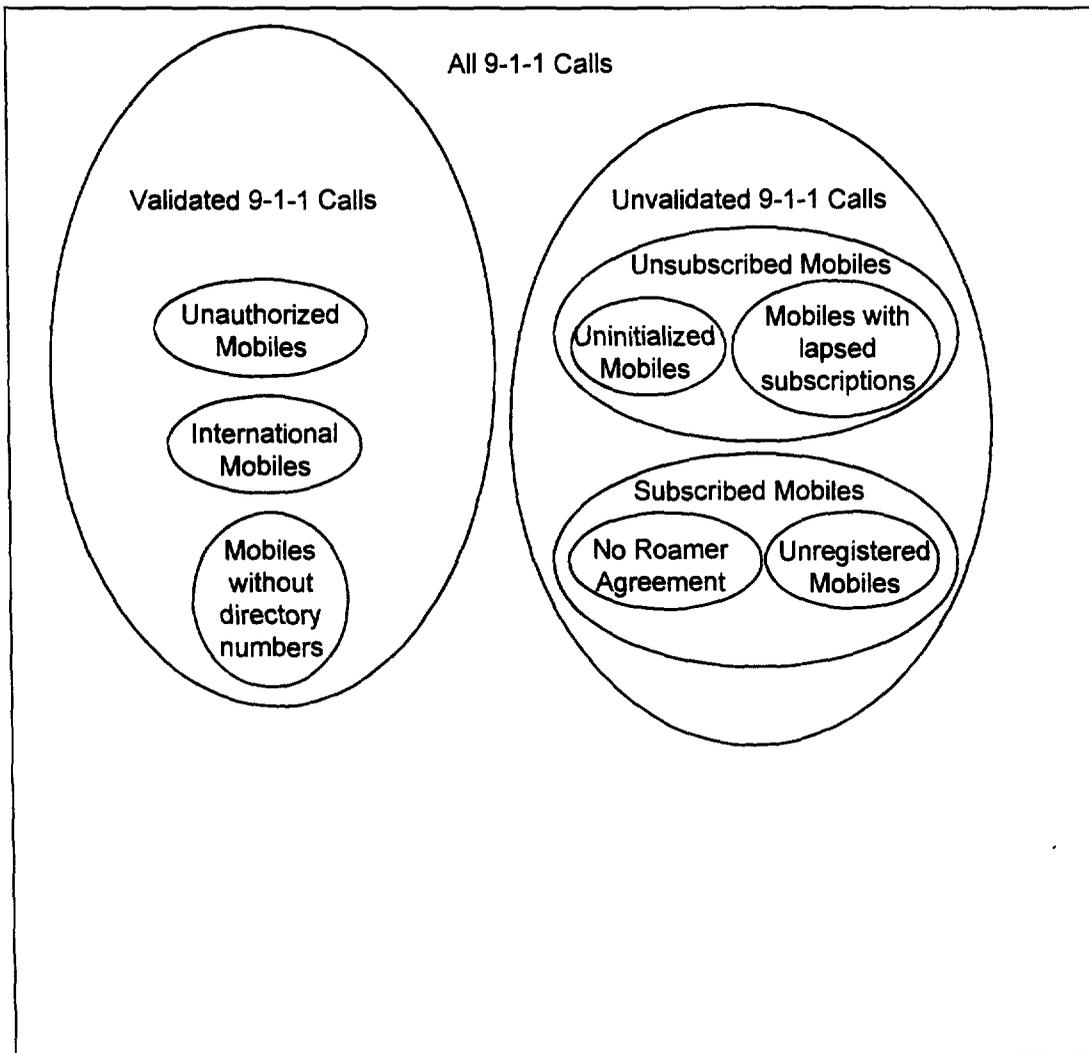
Graphical Representation of Callback Cases

The following figure is a Venn diagram showing the various sets and subsets of 9-1-1 callers. Some of the techniques identified handle some of the exception cases while others do not. The outer box representing all 9-1-1 callers is divided between validated and unvalidated 9-1-1 callers. Validated callers are those callers for whom a legitimate subscription record can be obtained. Unvalidated callers are those callers for whom validation could not be performed and for those for whom validation failed for any reason.

Within the validated callers, some problems exist for some techniques for international mobiles, for mobiles without dialable PSTN directory numbers, and for unauthorized mobiles (a mobile that is known, but not authorized for incoming calls). Unvalidated 9-1-1 calls are divided between callers with a subscription and callers without a subscription. Unvalidated callers with a subscription include mobiles whose home service provider does not have a roaming agreement with the serving service provider. It also includes mobiles who make calls immediately upon power up before registration procedures are performed. Unsubscribed and unvalidated mobiles include uninitialized mobiles (the mobiles fresh from the factory) and mobiles that have previously been activated, but whose subscription has lapsed. (This does not include subscriptions that have been suspended for administrative reasons (e.g., non-payment, stolen, lost, etc.), as these mobiles will be validated, but not authorized to make or receive normal calls. Unvalidated callers include other cases, such as detected clones.

(see diagram next page)

Figure 1: Venn diagram for 9-1-1 calls



Complexity and Funding Issues

9-1-1 service is not free, and is typically funded through telephone bill surcharges. Since, today, non-subscribers do not pay surcharges, the cost of providing callback capability to that subset of nonsubscribers will have to be absorbed by the paying subscribers.

Whatever the method chosen to provide callback to non-subscribers, complexity and cost are issues the 9-1-1 authority will have to address. Complexity and cost often go hand-in-hand, but not always. There may be a solution that is simple and inexpensive for the carrier, but overly cumbersome for the PSAP.

Either way, there is a cost to the PSAP over and above the normal call handling charges. If the percentages of non-subscribers are confirmed to be as suspected, the issue of callback will become one of cost versus benefit. As an example, will a PSAP that is collecting \$1 per month per subscriber, of which \$.75 goes to pay for service from subscribers, be willing to pay \$4 per month (plus the dollar surcharge they are not receiving) for service from non-subscribers?

It is suggested that callback to unsubscribed callers will evolve as a vertical service over and above the basic requirements for Phase I and Phase II wireless enhanced 9-1-1 service. The decision to buy or not buy the service will be driven by some or all of the following factors:

What percentage of wireless 9-1-1 calls received at the PSAP(s) are from non-subscribers? Is it a significant or negligible number?

Is there sufficient funding available to pay for it?

If not, can additional funding be acquired?

Has the 9-1-1 authority made a decision to provide the same level of service for all callers, even if it exceeds FCC requirements, regardless of cost?

II. RECOMMENDATIONS

How Many Calls Placed to 9-1-1 Cannot Be Successfully Called Back

It has been generally agreed that the most appropriate and efficient solutions for expanding call back capabilities for wireless-originated calls should correspond with the dimensions of the problem -- i.e., the proportional rate for those situations where PSAPs are unable to contact callers who have placed a 9-1-1 call over a wireless network.

Working Group Recommendations:

1. **Determine the percentage (with a reasonable degree of confidence) of 9-1-1 calls originating on wireless networks that cannot be called back and, if possible, categorize this subset according to the following reasons: (a) no roamer agreement, (b) lapsed subscriber, and (c) uninitialized mobile stations.**

Such efforts would include the following:

- o Public safety provider organizations be asked to provide data or validating information concerning the approximate percentage of 9-1-1 calls (that originate on wireless systems) where call back capability would be needed or warranted.
- o Industry be asked to provide data or validation that illustrates the range of circumstances and a realistic approximation of their proportional representation where a call back number cannot be supplied by the system.

2. **Based on the above stated determinations, if the percentage of situations where there is no call-back capability is already low (possibly under 2%), there may be little or no justification for further actions. Alternatively, if the estimated percentage is substantially higher, additional efforts to expeditiously identify and implement practical solutions may be warranted.**

It is further recommended that the above-stated conclusions regarding the public interest need for call back capability should be confirmed by the public safety provider organizations (such as NENA, APCO, etc.).

3. **CTIA and PCIA initiate a "best effort" initiative for the development and implementation of a nationwide (possibly North American) mechanism for the processing of technologically-compatible 9-1-1 calls originating on wireless systems.**

This mechanism should ensure that carrier-to-carrier business relationships do not unduly impede progress in the area of assuring wider 9-1-1 call back capability.

III. CONCLUSION

Possible Courses of Action

Callback using normal call delivery (see J-STD-034) handles most 9-1-1 callers. However, there are a number of exception cases identified (see diagram). There

are several solutions which may be used to address these exception cases including:

- Universal interoperability mechanisms to eliminate non-technical barriers for subscribed domestic mobiles.
- ISUP and ISDN interconnection serves subscribed international mobiles.
- Border cell solutions, such as intersystem paging, may increase callback completion probability.
- Other methods that may be explored (including temporary callback number, roamer ports, spreading the default MIN over multiple values) may alleviate the remaining exception cases.

Any solution considered should recognize that there are two aspects:

1. Callback to the caller (short duration, e.g., less than one hour)
2. ID caller for investigative (e.g. prank call) purposes (longer duration)