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January 6, 1995

Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Dear Commissioners

Attached are Redcom Laboratories Incorporated comments pertaining to the Notice of Proposed Rule Making, CC Docket No. 94-102, "REVISION OF THE COMMISSION'S RULES TO ENSURE COMPATIBILITY WITH ENHANCED 911 EMERGENCY CALLING SYSTEMS".

The first 20 pages following this cover letter contain items 1 through 60 as presented in the above mentioned document along with our comments on each item. The last few pages contain our comments regarding the proposed amendments to Title 47 of the Code of Federal Regulations, Part 68.

We hope our comments will be beneficial in helping to resolve this important issue.

Sincerely

Jerome S. Caplan

Director of Compliance and
System Certification

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I. INTRODUCTION	
<p>1. In this proceeding, the Commission proposes to amend its regulations to address issues raised by the provision of 911 and enhanced 911 services through certain telecommunications technologies. The primary objective of this proceeding is to ensure broad availability of 911 and enhanced 911 services to users of the public switched telephone network (PSTN) whose health and safety may depend on 911 emergency services systems. Toward this end, we intend to ensure that the effective operation of 911 services is not compromised by new developments in telecommunications. First, we address a petition filed by the Adcomm Engineering Company ("Adcomm") to amend Part 68 of the rules by proposing technical performance requirements that ensure the compatibility of private branch exchanges (PBXs) with enhanced 911 emergency services. In this Notice of Proposed Rulemaking, we seek comment on proposals for ensuring the compatibility of private branch exchanges (PBXs) and other dispersed private telephone systems with enhanced 911 emergency services.</p>	<p>No Comment</p>
<p>2. Second, we propose to adopt rules that would require wireless services, in particular commercial mobile radio services (CMRS) that provide real time voice services, to include features that will make enhanced 911 services available to mobile radio callers. These features include Station Number Identification (SNI), Automatic Location Information (ALI), Selective Routing (SR), and other features for 911 calls provided over wireless mobile units. This action responds to a Petition for Reconsideration filed by the Texas Advisory Commission on State Emergency Communications (TX-ACSEC) under the Office of the Attorney General for the state of Texas. It also responds to the issues raised in the Emergency Access Position Paper filed recently by the Associated Public Safety Communications Officials-International, Inc. (APCO), the National Emergency Number Association (NENA), the National Association of State Nine One One Administrators (NASNA), and the Personal Communications Industry Association (PCIA).</p>	<p>No Comment</p>
II. BACKGROUND	
<p>3. Since AT&T's announcement in 1965 that the digits 9-1-1 would be made available nationally as an emergency telephone number, the use of 911 for emergency purposes has become widespread. The Commission's Network Reliability Council, in performing a special study of the reliability of 911 services, found that "the American public depends on 911 services in its emergencies." The Council found that 89 percent of the wireline access lines in the United States are served by some form of 911 service and that the service is increasingly engineered to provide a high level of reliability. Currently, about 260,000 calls nationwide are placed to 911 every day.</p>	<p>No Comment</p>

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<p>4. 911 emergency services enable telephone users to receive, and state and local governments to provide, fast response to emergency situations. The ability to dial 911 offers several advantages to users. First, it is a single, nationally used three-digit number that is easy to remember and dial in emergency situations. This provides callers, including children, with easy access to emergency services in areas where the telephone number for the various emergency service providers is not readily known. Second, because 911 calls are sent to Public Safety Answering Points (PSAPs) over dedicated telephone lines, these calls are recognized and answered as emergency calls by professionals trained to assist callers in need of emergency assistance. Third, the use of 911 shortens the response time to requests for assistance because PSAP professionals have ready access to police, fire, and health emergency response service providers.</p>	<p>No Comment</p>
<p>5. There are different levels of 911 services available, depending on the location. Basic 911 service is a forwarding arrangement in which calls dialed to the 911 telephone number are translated at a telephone company switch and are transmitted to a public safety agency for response. Most emergency systems, however, have enhanced this service.</p>	<p>No Comment</p>
<p>6. Enhanced 911 systems help emergency services personnel achieve the shortest possible emergency response time by using Automatic Number Identification (ANI) to route an emergency call to the PSAP nearest the caller's location. At a minimum, enhanced 911 service provides the PSAP with the ANI of the calling party, permitting the PSAP to call back in the event the call is disconnected. A fully enhanced 911 system not only displays the ANI, but also permits an attendant at the PSAP to identify the calling party's address through the use of an external Automatic Location Identification (ALI) database. The ALI feature also permits selective routing (SR) of the call to the appropriate PSAP for the identified location and displays the public safety agencies (fire, police and emergency medical services) covering that location on the PSAP terminal. A fully enhanced 911 system may also provide the PSAP with other information, including the name of the subscriber, city, zip code, telephone number, date, time of day, and the class of telephone service (business, residential, etc.). Approximately 85% of 911 services include some form of enhanced 911 service.</p>	<p>No Comment</p>
<p>7. Congress created the Federal Communications Commission "for the purpose [among others] of promoting safety of life and property through the use of wire and radio communication...."¹⁰ This Commission has jurisdiction to license the electromagnetic spectrum, and also to regulate "instrumentalities, facilities [and] apparatus" through which wire and radio services are provided. It is difficult to identify a nationwide wire or radio communication service more immediately associated with promoting safety of life and property than 911. We believe that broad availability of 911 and enhanced 911 services will best promote "safety of life and property through the use of wire and radio communication."</p>	<p>We agree with this position.</p>
<p>8. Private Branch Exchange and Dispersed Private Telephone Systems. Private Branch Exchange (PBX) and other dispersed private telephone systems may present location identification problems for emergency services personnel. PBX</p>	<p>We concur with the statement.</p>

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<p>systems route calls between telephone stations in an organization and connect those stations to the public switched telephone network through trunk lines. A single PBX may serve a number of different buildings. When a caller dials 9-1-1 from a station served by a PBX, a PSAP attendant may be able to retrieve the street address of a main building (the billing address associated with the ANI). Determining the precise location of the caller within a large building or at a station within a PBX that serves more than one building, however, may be complicated and time-consuming in a situation where time is critical. While it is technically feasible to include location identification information in transmitting calls from stations served by PBX or other dispersed private telephone systems, there currently is no uniform means for ensuring that this information reaches emergency services personnel. Moreover, telephone users may or may not be aware that their telephone service is provided through PBX systems, and, in any event, are unlikely to be aware of 911 capabilities or limitations of the PBX systems. Yet, the ability of 911 service providers to deliver life saving services to them may depend on PBX compatibility with enhanced 911 systems.</p>	
<p>9. Enhanced 911 and Wireless Systems. While some wireless systems are capable of providing basic 911 service, few, if any, are currently capable of providing an enhanced 911 service. This raises public policy concerns because the number of calls to 911 from wireless users, such as cellular telephone customers, is increasing rapidly. More than 13,000 new cellular telephones are installed daily in the United States. In major metropolitan areas, it is estimated that as many as 10% of the 911 calls originate from mobile radio service subscribers. For example, in January 1993, one California Highway Patrol communication facility fielded 80,000 calls for emergency assistance, 25,076 of which were from cellular telephones. In 1987, the Massachusetts state police received only about 300 cellular calls per month. By December 1992, that number had grown to more than 15,700. We expect growth in the use of mobile radio services to continue. It has been estimated that by 1998 there will be 32 million cellular customers and 2.6 million Personal Communications Networks customers.</p>	<p>We concur with the statement.</p>
<p>10. The continuing growth of mobile radio service customers will increase the number of 911 calls that are placed from mobile telephones. As currently configured, however, wireless 911 services are inferior to the wireline 911 services that telephone users have come to expect. Specifically, 911 calls originated by mobile radio users generally do not provide PSAP attendants with the caller's precise location. Because the callers may not know their location, the ability of emergency service personnel to respond is hindered.</p>	<p>We concur with the statement.</p>
<p>III. COMPATIBILITY OF PBX EQUIPMENT WITH 911 SYSTEMS</p>	
<p>11. Several states and localities have passed regulations or ordinances for the purpose of requiring PBX equipment to be compatible with 911 systems. The specific requirements, however, vary significantly from one state to another. While several types of equipment and services may be available to ensure</p>	<p>Noted.</p>

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<p>accurate routing of 911 calls from PBX or other dispersed private telephone systems, a lack of uniformity in this equipment may impair public emergency services by delivering inaccurate, incomplete, or misleading call origination information to the public switched telephone network. Moreover, mutually incompatible systems for resolving this problem are likely to cause user confusion or higher costs in equipment or services.</p>	
<p>12. We propose to amend Part 68 of our rules to ensure the compatibility of PBX equipment with enhanced 911 services. The record in this proceeding, discussed below, indicates that market forces to date have not been effective in implementing a solution to this problem. States and localities are considering separate and possibly conflicting regulations on PBX owners and equipment. Failure to address the problem quickly could result in increased costs as equipment that is not compatible with enhanced 911 systems becomes more widely distributed. Accordingly, we find that it is in the public interest to propose rules to require that PBX and other dispersed private telephone systems (hereinafter referred to collectively as "PBX equipment") operate effectively with enhanced 911 systems.</p>	<p>We concur with the statement.</p>
<p>A. Adcomm and Industry Proposals</p>	
<p>13. Adcomm Petition. The Adcomm petition seeks to prevent situations in which the provision of emergency services to a caller is delayed because the caller's location cannot be precisely determined when the caller dials 9-1-1 from a telephone served by PBX equipment. Adcomm proposes specific rules to ensure that telephone stations served by PBX equipment are compatible with public emergency access networks. Adcomm points out that the resolution of this problem will require accurate management of telephone number databases and may have implications for the North American Numbering Plan by creating additional demand for numbers. Adcomm states, however, that its proposed amendments address only that aspect of Part 68 concerned with preserving the integrity of emergency services provided on the public switched telephone networks. Specifically, Adcomm's proposed rules are ". . . simply intended to align interface approaches without proposing to control user implementations or local exchange carrier (LEC) services." Adcomm's proposal would: (1) require PBX equipment to provide specific location information of the calling station to enhanced 911 systems; (2) require premises owners to provide local telephone companies with information on their PBX systems; (3) require certain training, verification, supervision and testing procedures for PBX operation; (4) specify signal power limitations; and (5) set technical standards for compatibility with enhanced 911 systems, including trunk interface and signaling requirements.</p>	<p>The Adcomm proposal does not address the complexity of change required to address this issue. While a beginning point must necessarily be less than a complete answer, the Commission must allow time for equipment manufacturers to respond to the new rules. Flexibility is key to successful implementation. Failure to allow adequate time and flexibility to address the issues properly simply puts the Commission in the role of creating a marketplace for one vendor who has a specific device to address a sub-set of the issues.</p> <p>The specific topics outlined will be further addressed later in our comments.</p>
<p>14. Industry Efforts. The Telecommunications Industry Association (TIA), through a subcommittee of its Multi-line Telecommunications Committee, has been working to develop technical standards for PBXs to resolve the Enhanced 911 problem. In October, 1993, TIA issued a Technical Systems Bulletin (TSB-103) entitled "PBX and KTS Support of Enhanced 911 Calling Service", which addresses dialing, call routing, and caller location database issues associated</p>	<p>The TIA document, TSB-103 should be a part of the official appendix of this proceeding. A draft should be available to all commenters for review for comment inclusion in this proceeding. There are numerous technical aspects of leading-edge switching equipment designs which are not shared with TIA membership which necessarily must be allowed for. An example is packet switching (Frame relay or ATM) which must have identifiers in each packet to ensure packets relating to 911 call information is not discarded due to traffic congestion.</p>

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<p>with PBX and KTS support of enhanced 911 service providers. TIA anticipates final voting by the membership on these proposals in late 1994.</p>	
<p>15. Comments. Commenters responding to Adcomm's petition generally acknowledge the need to ensure compatibility between PBXs and Enhanced 911 services, but take different positions on how compatibility may best be achieved. Bell Atlantic, BellSouth, GTE, and TIA urge the Commission to delay action pending industry consensus on standards. The North American Telecommunications Association (NATA) and the South Carolina Budget and Control Board (SCBCB) contend that the Commission should lead any such industry effort. SCBCB states it cannot endorse the Adcomm proposal due to potential technical and financial hardships. NATA objects to Adcomm's proposed verification requirements and opposes new training requirements on customer premises equipment (CPE) installation personnel. NATA argues that LECs do not offer the kind of interconnection of switched services that would permit PBXs to transmit station identification in a format that could be accepted or processed by the telephone network.</p>	<p>The issues raised here reflect the "tip of the iceberg" regarding the cost of the evolution. Clearly, the small business user community cannot be burdened with expensive solutions, especially in these economic times.</p> <p>One of the most critical aspects of this interconnect issue has not even been discussed anywhere in this proceeding. Beginning January 1, 1995, the Rochester, N.Y. telephone franchise will be fully open to competition. Dial tone may be provided to customers by desk-top PC's operating out of a garage. The major issue may not be what the telephone network TODAY can transport, but what the telephone network TOMORROW MUST transport, whether the service provider is a Bell company or the local grocer with a PC.</p>
<p>16. APCO, which supports the petition, expresses concern about PBXs that block 911 calls in favor of an internal safety service. APCO is also concerned about the confusion caused when an extra digit must be dialed to get an outside line before dialing 911 from a PBX station in an emergency. BellSouth, GTE, and NATA express concern about the cost of dedicated 911 trunks and the impact of the proposal on the North American Numbering Plan (NANP). Adcomm notes that the enhanced 911 trunking mentioned in its petition was not intended to require PBXs to have dedicated trunks to PSAPs. Adcomm states that, under its proposed rules, end users and LECs may choose different ways of handling trunking. GTE suggests there are particular difficulties identifying the location of calls placed from college campuses, hospitals, military installations and wireless PBXs.</p>	<p>Some industrial complexes and most military complexes have their own safety departments which may include police, fire, Haz-Mat, and medical services. Their 24x7 staffed operations centers provide a far greater level of understanding of a problem being reported than any civilian 911 agency could possibly provide, especially if the level of training given and the tenure of telecommunicators is considered. In fact, civilian agencies are frequently barred from entering industrial and civilian complexes because of special security or hazard requirements. These exceptions to normal response behaviors must be accommodated.</p> <p>The short-sighted view presented by the Telco's requiring dedicated trunks from PBXs illustrates a lack of concern for end consumer cost to implement some forms of access. In a large metropolitan area, thousands of new dedicated trunks would have to be added to the service providers network to accommodate these trunks. One would presume the provider(Telco?) doesn't do this for free.</p>
<p>17. Commenters identified several specific elements that should be included in any resolution of the PBX/enhanced 911 compatibility issue. GTE states that compatibility will require the creation of a standard LEC/private switching system interface with identifying information for private switching system calling stations, private switching system compliance with NENA standards for the transmission of ALI data to the telephone company or caller location database, and the creation of either alternative number identification or Direct Inward Dial (DID) numbers for private switching system stations. Bell Atlantic concurs with GTE that any technical standards should specifically include the signaling and protocol specifications that have been published by NENA, to ensure that calls sent from PBXs to 911 systems carry proper identifying information. NATA states that any rules the Commission adopts should ensure that telephone companies develop and market the least costly form of Enhanced 911 interconnection, and that such costs be fairly distributed. GTE asserts that a solution may also require added functionality in end office switches and additional telephone number assignments.</p>	<p>We agree in concept to these statements, however, certain dangerous assumptions are apparent</p> <p>The tens of thousands of non-DID stations connected behind PBXs and KTU systems would indeed place a significant burden on the national telephone numbering scheme. It is, however, not only unnecessary but unfeasible. New technology thrusts are moving to one telephone number, transportable around the country as needed. Couple this with the thousands of new dial tone service providers (former Telco's and interconnects) that there will be in the network, it is ludicrous to believe the "Telco will assign the numbers" for these stations. The service provider ("telephone company") doesn't "own" the numbers; the public does.</p> <p>It also doesn't necessarily follow that the existing "telephone company" will be the keeper of the 911 ALI database. It is certainly within the technical capabilities of other service providers to have their own databases and trunks to a 911 center. If the Commission is intending to restrict alternative access to 911 centers by requiring new service providers to connect to and have their sensitive competitive data stored by the existing monopoly telephone company, it may be viewed as unconstitutionally anti-competitive. A possible solution would be a "third party cooperative" which would provide the database access for all companies, including the existing Telco. All providers would then have to handle the ALI information equally. Automatic electronic data transfers upon completion of install/change orders</p>

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	<p>would keep the database current and would keep the legal responsibility to do so in the hands of the service provider. A simple PC based transaction system could handle the smaller companies. This method would level the playing field for the smaller competitive companies and would eliminate the "big brother" appearance of the existing temporary-monopoly telephone company.</p> <p>A scheme to allow the telephone network to be a "path" between an intelligent PBX/KTU and the PSAP would seem to be one possible solution, with the public network sending the ANI of the line-side "trunk" and 911 service class mark identifying the signaling type and the PBX/KTU sending its own station digits. The 911 console would display all the originating data as well as data-base provided call-back info. The call-back info would identify if the calling number is the call-back (DID), whether the "trunk" ANI is the call back (Ring-in service), whether there is a different DID access number, and whether or not a local attendant is bridged on the call, either listen only or talk-allowed.</p> <p>Also to be addressed here is the requirement for privacy of number records, especially from the service provider, as the quantity of stations behind PBX/KTU systems and their numbering plan is competitive information, and may in fact, invoke national security issues regarding non-disclosure of certain numbers. In fact, PBX/KTU systems may have to substitute for or block certain station numbers.</p>
<p>18. TIA contends that Part 68 should specify as few technical details as possible to avoid stifling technological advancement of enhanced 911 services and equipment. In order to assure that enhanced 911 services will work properly, TIA states that the regulations should: (1) clearly define the responsibilities of all entities involved; (2) reference the appropriate standards to be used, preferably national; (3) set reasonable deadlines for compliance; and (4) involve regulatory agencies in educating the public regarding the deployment and use of enhanced 911 calling service.</p>	<p>Generally agree. However, with manufacturers of both 911 terminal equipment and network/premise switching equipment both developing independent plans, signalling methods, and protocols, consensus upon a standard would be all but impossible. Some interface signalling specification, including data fields to be exchanged, would allow parties on both sides (network switching/ 911 terminal equipment) to develop their own solutions for originating/terminating the information.</p>
<p>B. Discussion</p>	
<p>19. We believe that federal rules for achieving uniformity are appropriate in these circumstances to avoid confusion among telephone users connected to PBXs and to ensure that PBX equipment operates on the public switched telephone network (PSTN) at an optimal level for emergency purposes. The Adcomm petition, the comments received, and published reports of difficulties in delivering emergency services to the proper location indicate that the incompatibility of PBXs with enhanced 911 systems is hampering public safety access through the public switched telephone network.</p>	<p>See comments in 18.</p>
<p>20. We propose to amend Part 68 of the rules to require compatibility of PBX equipment with enhanced 911 systems. We agree with Adcomm and several commenters that any Part 68 requirements must take into account industry standards, protocols and technical references. Moreover, the comments persuade us that any proposal for amending our rules must consider not only the delivery of ANI, but also issues such as ALI database administration and the delivery of other information, e.g., calling party number, to the PSAP that may facilitate a more timely emergency response. We, therefore, initiate a Notice of Proposed Rulemaking to require compatibility of PBX equipment with enhanced 911 systems. The proposed rules are patterned closely after those proposed by</p>	<p>Any discussions and subsequent rules regarding database administration and related matters MUST account for the current transition to competition in the local loop. ALI information (database) of a local service provider is critical competitive information and therefore must be protected from competitors eyes. This includes the resident BOC/Independent TELCO in any area. For example, as this is written, Rochester Telephone Corp. has opened its territory for competition and already has no less than 5 competitors for local dial tone. The 911 trunking issue must also be resolved to PSAP's, including which local provider database to associate to which trunks.</p>

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<p>Adcomm, with modifications to reflect some of the commenters' concerns. We seek comment on these proposed rules.</p>	
<p>21. In considering the proposed rules, our paramount concern is to ensure that PBX equipment does not hinder delivery of emergency services by impeding the transmission of adequate location information over the PSTN. We believe that any rules adopted must provide sufficient flexibility to foster the development of alternative methods and technological innovation in resolving compatibility problems between PBX and other dispersed private telephone systems and enhanced 911 systems. Moreover, we believe that the proposed rules should carefully balance the need to achieve compatibility and the need to ensure that equipment owners and manufacturers are not unduly burdened in implementing such upgrades. We seek comment on whether the proposed rules permit sufficient flexibility in conforming PBX systems to the needs of their owners while ensuring that the location of callers to 9-1-1 is properly identified to PSAP operators. We seek comment on whether and how equipment manufacturers, multi-line telephone system (MLTS) service providers, local exchange carriers, public safety agencies, and others such as local building inspectors should be identified as responsible parties, as suggested in TSB-103. Commenters supporting this suggestion should discuss specific amendments to Part 68 that would achieve this objective. Further, we ask that commenters provide detailed analysis of the technical and cost considerations of implementing the proposed rules for equipment owners, equipment manufacturers, network service providers, and other affected parties. In addition, we seek comment on whether there are particular difficulties in applying the proposal to college campuses, hospitals, military installations or wireless PBXs, and on whether the proposed rules must be applied where the equipment serves a physically small location, such as a single story building, or a small number of closely situated telephone stations. Commenters should propose specific alternative language where they do not believe the proposed language is appropriate.</p>	<p>See comments 18 and 20. Also, individual PBX's may be "homed" to various local providers, which may not include the existing local exchange provider. Additionally, the territories served by these new local dial tone providers may have absolutely no relationship to existing political or LATA boundaries. Former NNX relationships to geographical locations absolutely are useless. This is further compounded by local number transportability which will completely erase this current relationship.</p> <p>There are many installations, especially military installations and private industry doing government contracts, where ALI information would want to be suppressed. Some of these locations may also have local security/fire/medical dispatch centers who answer campus 911 calls (e.g. Kodak, Rochester). Any 911 calls within the campus are directed to private communications centers. These locations must be able to forward selective ALI information to the PSAP if outside campus response is required.</p>
<p>22. 911 Availability. Both the Adcomm proposal and TSB-103 would require that PBX equipment properly route emergency calls dialed using the digits 911 or 9-911 (where 9 must be dialed to reach outside lines). TSB-103 notes that special dialing or routing features in PBX equipment, such as dial 9 blocking to prevent toll fraud and Automatic Route Selection for least cost routing, should not be implemented in ways that prevent 911 dialing. We tentatively conclude that a caller at a PBX station having the capability to reach the public switched network should have the ability to reach emergency services by dialing 911 without having to dial any additional digits. TSB-103 suggests that some form of user education or notification may be appropriate to ensure proper dialing by the casual user of terminal equipment within a PBX or dispersed private telephone system. We further propose to require that PBX equipment domestically manufactured or imported prior to the proposed implementation date of the rules be labeled with a warning describing its limitations for those attempting to use it to call enhanced 911. We seek comment on these proposed rules.</p>	<p>See also 21.</p> <p>Labeling should be the responsibility of the owner, not the manufacturer, as the owner generally has the capability to change routing within such PBX's without the knowledge of the manufacturer.</p>
<p>23. Attendant Notification. TSB-103 recommends that new PBX equipment be</p>	<p>We agree that an attendant be notified and automatically included in the conversation, MUTED, by action of an</p>

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<p>capable of alerting an attendant or other on-premises personnel and providing calling station information to such personnel when a 911 call is dialed. On premises personnel may assist emergency services personnel in locating or assisting the caller, particularly on large premises like schools, hotels, or military installations. TSB-103 points out that some state laws prohibit attendant "bridge-on" to a 911 call (e.g., a three way emergency call that includes the 911 caller, an attendant, and the PSAP operator) because it may create confusion. We propose to require PBX equipment to be capable of notifying an attendant, if one is present, and seek comment on our proposal. See Appendix C, proposed §68.320(e). We ask that commenters discuss any potential conflict with existing state or local regulations.</p>	<p>automatic conference bridge action. The attendant may then activate "cut-in" as needed to supplement information or provide detail the original caller may not have. Many "inside" users are knowledgeable about department information and possibly building identification, but can't give reference information for response purposes.</p>
<p>24. ALI database maintenance. Several commenters, as well as TSB-103, note that timely and accurate database maintenance is an essential element of enhanced 911 service. TSB-103 contends that any regulations should clearly define the responsibilities of all parties involved in implementing an enhanced 911 system. As noted above, accurate caller location information is vital to ensuring the timely delivery of emergency services through the public switched telephone network. TSB-103 demonstrates that a variety of customer premises equipment configurations or network services may perform this function. Both Adcomm and TSB-103 envision database maintenance as a separate issue from that of PBX equipment compatibility with enhanced 911.</p>	<p>See comments in 18-21. It would seem the only practical means would be to have direct user access via modem to the database. Appropriate passwords and filter screens would be used to protect information. Additionally, audit information can be stored for a period of time.</p>
<p>25. We propose to require coordination procedures to ensure accurate and timely transmission of database information by PBX owners to local exchange carriers. We expect that the proposed rules will permit accurate and timely database maintenance, irrespective of the services or technologies employed to update and transmit information to enhanced 911 systems. We seek comment on whether the verification and training procedures in the proposed rules are sufficient to ensure the delivery of accurate caller location information from PBX equipment to emergency services personnel. See Appendix C, proposed §§68.228 and 68.320. Commenters should state with specificity whether additional equipment or service requirements should be imposed to achieve compatibility.</p>	<p>The verification process proposed is bureaucratic and costly. The process proposed indicates a lack of understanding of current technological capability of network switches or PBX's. Phones may be moved about a premise and the switch automatically updates the line information, but would have no knowledge of the location without manual intervention. Large campus environments would require several full time people just to handle the administration of the changes to databases.</p> <p>The local exchange carriers (dial tone providers) will be in a competitive environment and must be paid for each and every change made to remain competitive in their own markets unless each dial-tone provider is made independently responsible for their own E-911 database and trunking information.</p>
<p>26. Station Number Identification (SNI). Several states that have established 911 as the primary emergency telephone number require certain minimum information to be delivered to PSAPs. Typically, such states require the caller's station number, caller location identification, and a call-back number. We tentatively conclude that our rules should establish that, at a minimum, a caller's telephone number, caller location identification, and a call-back number must be transmitted from the PBX or other dispersed private telephone system for use at the PSAP. We seek comment on these requirements and ask whether additional information requirements should be adopted. TSB-103 and GTE advocate the creation of alternative number identification (an "artificial" SNI) for each calling station on PBX equipment to facilitate delivery of caller location identification and to permit call-back by emergency services personnel. We seek comment on this approach, particularly with respect to commenters' concerns about its impact on</p>	<p>See comments 18-21. The artificial SNI proposed must not be allowed to be implemented as the local NNX doesn't have any geographical relationship in a competitive environment anyway. Better to address the Listed Directory Number or billing number and PBX extension information directly. Give the PBX owner the responsibility to keep the database updated. Any owner who does databases for the PBX should have the wherewithal to maintain an ALI database.</p>

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<p>the North American Numbering Plan (NANP). We ask that commenters describe in detail how the proposed rules would affect the NANP, and that proponents of any alternatives to these proposals include an assessment of the potential impact of such alternatives on the NANP, as well as specific proposed language for inclusion in the rules.</p>	
<p>27. Information Protocol Standard. Bell Atlantic and GTE suggest that NENA standards for information protocol (the format in which information is transmitted for display on a PSAP attendant's screen) should be explicitly referenced in any rules governing enhanced 911 services that we adopt. We seek comment on this proposal, and a detailed analysis of the relevant cost and technical considerations. Specifically, we seek comment on whether this is the most appropriate format for transmitting information about 911 calls, and whether, or how, this format should be incorporated in our rules. Whether or not the NENA standard is appropriate for purposes of PBX compatibility with enhanced 911 systems, we believe that a standard protocol for transmission of information associated with 911 calls is essential. Costs for PBX equipment are unnecessarily increased by a multiplicity of formats, and we tentatively conclude that the potential for user confusion absent a uniform format warrants the adoption of a nationwide standard in our rules.</p>	<p>We concur that a nationwide standard is needed. Much work is needed to identify the impact of competitive local loop operations (both companies and electronic switch media) before a typical interface requirement be established. It may not be possible to identify all information aspects with current technology.</p>
<p>28. Network Interface Standards. TSB-103 notes that some PBX equipment may directly access the Automatic Location Identification Database Management System (ALI DMS) to input and update changes in station location records. TSB-103 states that these data link interfaces should be standardized, and that such standards should address security and data integrity verification issues. We seek comment on this recommendation. Commenters should specifically address the technical feasibility, cost, and current availability of systems for ensuring security and data integrity verification. Commenters also should propose specific language for inclusion in the rules.</p>	<p>Belcore no longer speaks for the national network companies. The "standards" they create are "standards" only to the extent that users (local dial tone providers) purchase their equipment. In the new world of local loop competition, Belcore "standards" are meaningless. Any proposed rule should not adopt the Belcore "standard" without close scrutiny for anti-competitive issues.</p>
<p>29. Local Exchange Company Services. We seek comment on the kind of LEC services that are essential to the compatibility of enhanced 911 systems with PBX equipment. Adcomm, TSB-103 and NATA acknowledge that telephone company services play an essential role in the identification of caller location to a PSAP. Local telephone companies provide facilities interface codes and tariffed network services that enable equipment registered at the Commission to be supported in the network. Their involvement is essential to enable PBXs to transmit proper identification and location information to a 911 tandem or PSAP. Specifically, we seek detailed information on the availability, cost, and any other factors affecting the implementation of LEC services to support the requirements set forth in our proposed rules or to support any alternative solution to the instant compatibility problem.</p>	<p>See comments 18-28.</p>
<p>C. Implementation Schedule</p>	
<p>30. We tentatively conclude that we should require rapid implementation of</p>	<p>We totally oppose mandatory manufacturers compliance requirements as the currently deployed technology may not</p>

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<p>features capable of implementation with minimal difficulties for PBX equipment. Both the record in the Adcomm proceeding and TSB-103 indicate that coordination and standardization, rather than technical difficulties, are the chief obstacles to achieving compatibility between 911 systems and PBX equipment. In any event, minor technical obstacles should not unreasonably delay equipment modifications affecting public safety access. We believe that a proposal to require compliance as a condition of registration of new equipment would impose a minimal burden on manufacturers and suppliers, and would not impose significant burdens on users or customers served by 911 emergency systems. We ask for comment on this analysis.</p>	<p>even have call processing software associated with the system as manufactured. Virtually anybody's computer can control call processing functions of many existing switches and some PBX's. The manufacturer has no control over call processing programs designed by the users themselves. Any registration restrictions must be separated from the hardware and firmware manufacturing process and the call processing software development. This burden is significant, especially in light of the competitive nature of the local loop today. The rules should be based on "service standards" rather than hardware or software registration standards. For example, stating that Leech's (including the new competitors) provide 911 access to "subscribers" is adequate. Let the LEC determine the best way to handle the requirement. The LEC then has a choice of purchasing a switch which has the capability or generating the necessary software himself for remote computer controlled switches. Redcom offers to the rule making body an opportunity for further discussion on this issue, at which time Redcom's 15 year experience in this field may be shared.</p>
<p>31. We propose that the manufacture and importation of PBX equipment that does not comply with these provisions must cease as of one year from the effective date of the order adopting rules. In this proceeding, the proposed rule would impose these requirements on equipment that is newly installed more than 18 months after the effective date of the order adopting; rules in this proceeding, thus prohibiting the installation of non-complying equipment beyond that date. We do not propose to require manufacturers and suppliers to reregister grandfathered equipment or to reconfigure equipment that has been installed as of the effective date of the order. We tentatively conclude that the restrictions on importation, manufacture and installation of non-complying equipment are sufficient to promote rapid deployment of equipment that is compatible with enhanced 911 systems, and we seek comment on this analysis. In the interim period, we propose that any PBX equipment subject to these requirements that is manufactured or imported on or after 30 days from the effective date of the order adopting rules in this proceeding that does not comply with the PBX rule provisions be labeled with emergency dialing instructions on the device and on the outside of the packaging in which it is marketed. We seek comment on these proposed dates and requirements. We invite alternative recommendations with an analysis of the costs and benefits of those alternatives.</p>	<p>We ABSOLUTELY OPPOSE any rule to this effect. See comment 30. The proposed language is far too broad and is anti-competitive. Redcom is also an exporter of PBX equipment. The way the rule is stated, we could no longer manufacture for export without the useless (to foreign countries) American 911 standard software and hardware. That is anti-competitive and discriminatory.</p> <p>Additionally, the proposed requirement for an 18 month grace period before installation compliance is mandated is much too short and creates an undue hardship and devaluation of existing PBX products in the used PBX market. A minimum of 5 years is required.</p>
<p>IV. COMPATIBILITY WITH OF WIRELESS SERVICES WITH ENHANCED 911</p>	
<p>32. The Texas Advisory Commission on State Emergency Communications (TX-ACSEC) filed a petition for reconsideration in the PCS proceeding asking that we require PCS licensees to provide accurate location information about 911 callers from the outset. It also requested that we mandate a single enhanced 911 standard for all wireless technologies so that local governments are not required to expend scarce resources configuring their systems to handle a multitude of signalling protocols and interfaces. TX-ACSEC argued that we must act on these fronts.</p>	<p>No comment.</p>
<p>33. Several parties, such as the Association of Public-Safety Communications Officials International, Inc. (APCO) and the National Emergency Number Association, filed comments in support of TX-ACSEC's position. KSI, Inc. ("KSI"),</p>	<p>We agree that the PCS and mobile services development should not be unduly stifled. Some stepped transition rules may be necessary, thus giving notice to these new services that migration to a final standard is required prior to their deployment in quantity.</p>

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<p>agreed that we should require PCS licensees to provide enhanced 911 services, but argued against a Commission-mandated enhanced 911 standard. KSI stated that a single enhanced 911 standard could stifle the development of possible alternative solutions by lessening the availability of capital to companies, like KSI, with nascent enhanced 911 technologies. APCO-International and others also believe that we should establish performance requirements while allowing industry to develop the necessary standards. American Personal Communications, American Telephone and Telegraph, MCI Telecommunications Corporation and Telocator (PCIA)³⁷ all acknowledged the need for enhanced 911 capabilities in mobile telephone networks, but argued that enhanced 911 standards should be developed separately from the PCS proceeding so as not to delay the implementation of PCS.</p>	
<p>34. We have become increasingly concerned about the inability of mobile radio systems to interface with the enhanced 911 systems that have been deployed in wireline networks. In the Second Report and Order, we stated that industry and standards-setting bodies should direct particular attention to offering an emergency 911 capability for services that would work with enhanced 911 systems and, to the extent feasible, permit locating a caller when the caller does not know his location. We expressed particular concern that unless such capability is designed into personal communications system (PCS) equipment, dialing 911 from a PCS telephone would not be equivalent to dialing 911 from a wireline telephone. We added that the health and safety of citizens, as well as the fullest commercial success of PCS, would be affected by whether PCS is capable of providing enhanced 911 services. Accordingly, we stated that we intended to initiate a future proceeding to address enhanced 911 and related issues with regard to PCS, cellular, and any other relevant mobile service. In the Memorandum Opinion and Order, GEN Docket No. 90-314 (adopted June 9, 1994) at para. 202, we dismissed TXACSEC's petition for reconsideration, stating that the issues raised therein would be addressed in a separate proceeding.</p>	<p>See 33. Additionally, ALI information should be updated as a call is in progress to the 911 center so an in-progress event can be tracked. This is especially important for roamer calls where the person is not familiar with the local landmarks.</p>
<p>35. On June 30, 1994, APCO, NENA, NASNA, and PCIA issued an "Emergency Access Position Paper" ("Joint Paper"), which they filed as an ex parte comment in the PCS proceeding. See Appendix D. The Joint Paper presents the consensus recommendations of these organizations to assist standards bodies in developing appropriate standards for emergency access from wireless service systems to "9-11 type systems."</p>	<p>No comment.</p>
<p>36. The record before us indicates support for incorporating enhanced 911 technology in mobile telephone networks. The record also suggests that parties are skeptical of our ability to mandate an enhanced 911 standard in the PCS rulemaking proceeding without significantly delaying the implementation of PCS. Accordingly, we are initiating this separate rulemaking proceeding to address the enhanced 911 capabilities of PCS, cellular, and other relevant radio services. We are basing most of our proposals on the Joint Paper.</p>	<p>No comment.</p>
<p>B. Discussion</p>	

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<p>37. We believe that Commission action is necessary to ensure that, over time, mobile radio service users on the public switched telephone network have the same level of access to 911 emergency services as wireline callers. Wireless customers clearly expect access to 911 services, and may be unaware that their mobile radio services do not provide the kind of location information that emergency services personnel receive from stations on the wireline network. Thus, as the use of wireless services expands, those who access the public switched telephone network through mobile radio units may suffer a degradation in access to 911 emergency services absent a requirement that mobile radio systems must be compatible with enhanced 911 services. Accordingly, we propose to require that mobile radio transmitters supplied to wireless customers provide the same level of access to 911 emergency services as is available to wireline customers.</p>	<p>Concur.</p>
<p>38. As an initial matter, we need to define the categories of mobile radio services that might be subject to compatibility requirements with enhanced 911 services. Our initial view is that mobile radio services offering access to real-time voice services provided on the public switched network may be an appropriate definition. 911 service today primarily depends on voice, or voice equivalent (text telephone or TTY) communication. We believe that users of voice mobile radio services today reasonably expect to have access to emergency services through 911. These customers would seem to be the population of mobile radio users PSAP facilities are primarily organized to serve. For example, cellular radio systems already represent a significant, and increasing, community of 911 service users. We seek comment on this analysis. Should any compatibility requirements that might be imposed on mobile radio services be limited to those features most closely resembling traditional 911 services? Would commercial mobile radio services (CMRS)⁴⁴ providing real-time voice be an appropriate category, or should other, more limited services, such as one-way paging or the Non-Voice, Non-Geostationary Mobile Satellite Service, be required to meet compatibility requirements for some or all 911 features? What are the social, economic and other costs of including or excluding various categories of mobile radio services from any 911 compatibility requirements that might be developed? What are the costs and benefits of requiring any or all of the various 911 features? What time frames would be appropriate for requiring such features? Commenters should discuss how these considerations might vary with respect to specific types of services, e.g., cellular, PCS, or mobile satellite services. While we do not initially propose to apply rules for 911 compatibility to private mobile radio services, which may not be available to the public or interconnected with the public switched network, we ask for comment on this decision. We request comments on whether and how the proposed performance requirements, particularly phase-in periods, should be applied to existing systems (e.g., cellular) vis-a-vis new systems such as PCS. We also ask for comment on our proposal to limit this requirement to services capable of providing real-time voice.</p>	<p>We generally agree that services which can be used to report to 911 centers should provide ALI. However, many existing LB, VHF, and UHF radio services allow connection to the public network. These radio services would not be able to afford wholesale change-out of equipment designed to last 20-30 years. This would include Amateur Radio and business band radio. The cost to benefit ratio in these types of service would be prohibitive and an unnecessary burden.</p>
<p>39. With respect to appropriate features, we note that currently, mobile radio services, such as cellular, are able to provide access to 911 service, but they are</p>	<p>See answer 38</p>

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<p>unable to provide the information necessary for enhanced 911, such as the location of the caller (ALI), the number of the caller, call back capability, or an indication of the type of service required. By contrast, approximately 76% of wireline customers who have 911 services have access to these features. Availability of enhanced 911 service for wireless customers may require modifications to mobile radio handsets, mobile radio service provider networks, the public switched telephone network, or public safety access systems. In order to render functionally equivalent service, it appears that the mobile station must be able to communicate the information, e.g., ANI and ALI, to the base station, and the base station must be able to interpret all information transmitted from the mobile unit, provide the proper priority handling of 911 calls, and forward sufficient information to the public safety answering point to provide call back capability, location information (enabling selective routing), and determination of the type of emergency service needed.</p>	
<p>40. We propose to adopt rules to improve the access of users of mobile radio services to 911, particularly enhanced 911 services. While we do not anticipate adopting extensive technical standards for enhanced 911 operation -- industry standards-setting committees are better equipped to address precise technical requirements for enhanced 911 compatibility -- we propose that general performance criteria be adopted. We will discuss the essential capabilities proposed in the Joint Paper for access to 911 and enhanced 911 through wireless services.</p>	<p>No comment.</p>
<p>41. 911 availability. The Joint Paper recommends, and we propose, that a user have the ability to reach emergency services from any service initialized mobile radio handset in a home service area or a subscribed-to roamed service area by dialing only 911. This means that any mobile radio transmitter that is service initialized on a radio network must be allowed to make a 911 call without a requirement for user validation. We ask commenters to describe the extent to which mobile radio services and equipment provide these capabilities today, and whether or to what extent implementation of these features would require hardware changes to the mobile equipment or the associated base stations. What considerations are raised for new or developing services? Commenters should specifically address the application of this feature to mobile radio handsets used on a "roaming basis" or outside a mobile radio service provider's roaming area. Commenters should provide specific data on the economic and technical feasibility of such a requirement. We propose that this dialing feature be made available one year after the effective date of the order adopting rules in this proceeding, and we seek comment on the ability of licensees and equipment manufacturers to implement that feature in this time frame.</p>	<p>No comment.</p>
<p>42. Grade of service. The term "grade of service" refers to the percentage of calls between the mobile transmitter and the PSAP that are blocked either within the radio or the wireline network. The interconnection of a mobile radio transmitter call with a PSAP attendant may involve several interconnecting networks, including mobile radio links and the wireline PSTN. The Joint Paper expresses concern that competitive forces, expected to drive service quality levels in a</p>	<p>We concur.</p>

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<p>wireless environment, may result in higher blocking rates than wireline networks experience.</p>	
<p>43. The Joint Paper recommends, and we agree, that standards bodies should investigate technical solutions or other strategies to ensure minimal blocking of 911 calls from mobile radio transmitters. Any overall grade of service objective will require a cooperative effort between the initiating, interconnecting, and terminating systems. Our initial view is that federal standards are not warranted at this time. We seek comment on this assessment. Commenters advocating federal standards should describe how grades of service would be defined, and discuss any jurisdictional implications of imposing such standards.</p>	<p>This capability is critical for disaster situations where local networks are damaged or inundated with traffic requests, such as that experienced in an earthquake. A means of identifying at the ORIGINATION point (handset) that a call is a 911 priority call is required. This priority must be applied to RF spectrum access and successive switching efforts through any interconnecting networks until a PSAP is reached.</p>
<p>44. 911 call priority. We seek comment on our proposal to require that, one year after the effective date of the order adopting rules in this proceeding, originating 911 calls must be assigned priority over non-emergency service calls. This priority would be assigned at the handset and would extend to placing the 911 call at the beginning of any queue for calls waiting to be placed in the mobile radio network. Because of the unknown nature and importance of calls in progress, this priority would not require the interruption of calls in progress. We seek comment on whether this capability would require any major equipment modifications. Do existing systems have this capability? If not, what obstacles exist for developing this features? We seek comment on the technical feasibility and cost for licensees and equipment manufacturers of establishing priority for 911 calls in new and existing mobile radio networks.</p>	<p>We concur.</p>
<p>45. User location information. The Joint Paper finds that the wireless system should have the ability to identify the location of a wireless terminal used to make a 911 call. We agree. Automatic location identification (ALI) is more easily accomplished within a wired telephone network because the location of each telephone is known. ALI is not as easy in a mobile radio network because the caller can be located anywhere in the network's service area. In a wireless network, a caller's approximate location can be determined by identifying the specific transmitter that is communicating with the caller. Such approximations, however, may only narrow the location of the caller to an area of a few square miles and may be of minimal use to emergency service personnel, particularly in urban settings. Moreover, to obtain precise geographic location information, a PSAP would need to know not only the latitude and longitude of the mobile unit, but also its elevation in the event the caller is located in a high-rise building.</p>	<p>No comment.</p>
<p>46. We seek comment on the specific technical and cost considerations affecting the implementation of an ALI requirement for enhanced 911 service to wireless customers that would include detailed location information. While there are several possible methods available to provide location data with varying levels of precision, all of these raise issues regarding performance, cost or technical feasibility. These methods include: Global Positioning Satellites (GPS), including differential GPS; time delay measurements; received signal strength; ranging and triangulation; received signal angle of arrival, e.g., reception employing "smart" antenna technology or KSI's Direction Finding Localization System; CDMA time</p>	<p>No comment.</p>

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<p>synchronization; commercial FM multilateration; LORAN reception; automatic vehicle monitoring (AVM), time-of-arrival measures; and, cell site/radio port sectorization. All of these methods offer varying degrees of accuracy, affordability, and implementation problems. As an example, GPS does not work well if a caller is inside a building or amid obstructions that attenuate or block the satellite radio signals. Terrestrial radio triangulation methods are also hampered by interference and by signal reflection (multipath), though they are not as affected as satellite communications by attenuation inside buildings. Commenters should also address whether adding ALI components would increase the size of mobile radio transmitters or threaten the market-driven evolution toward smaller devices.</p>	
<p>47. We recently received a copy of a "Survey of Location Technologies to Support Mobile 9-1-1," conducted by C.J. Driscoll & Associates for APCO and the State of California, department of General Services Telecommunications Division. A copy of the report is being placed in the record of this proceeding. This report surveys eighteen different location systems that either exist or are under development and may be suitable for automatic location identification for enhanced 911 service. These systems use at least four different technologies. Some can be retrofitted on existing networks without changing the current mobile equipment. Others would require additional circuitry in new handsets. Location precision varies between about 15 and 125 meters, with most in the 30 to 60 meter range. The report estimates that the costs for handsets range from little to no additional cost to \$300 for retrofitting an existing cellular phone. Most of the systems range between about \$3 and \$30 per handset. The cost for base stations range between about \$10,000 and \$40,000 per base station. We invite comment on the APCO report, specifically with regard to the feasibility and accuracy of the various systems for ALI for enhanced 911 and the cost estimates. We also solicit information as to any systems or technologies that are not discussed in the report.</p>	<p>No comment.</p>
<p>48. We are aware that the industry is working with the public safety community to address many of the same issues that we are addressing in this proceeding, particularly with regard to ALI. A Joint Experts Meeting was held in early August under the auspices of the Telecommunications Industry Association TP45 Committee. This meeting addressed the specific technical characteristics needed for complete systems. Approximately 70 technical experts, representing cellular providers, manufacturers, telephone network operators, radio service providers and the enhanced 911 community attended this meeting. We are inserting a copy of the report of this meeting in the record for comment. A second Joint Experts Meeting was held in mid October under the auspices of the Personal Communications Industry Association, focusing on PCS in particular. These efforts will help to ensure that the rules finally adopted in this proceeding are as effective and efficient as possible.</p>	<p>We believe that ALL segments of the industry be kept advised of these developments and that sufficient review and comment intervals be allowed. It is noteworthy that nothing in this proceeding has addressed the competitive local loop environment, which is already upon us. Companies, both service and manufacturers) must be included in this process. Many of these new service providers will be cable companies who presently have a very limited knowledge of these issues.</p>
<p>49. Due to the concerns about technical and financial feasibility expressed by manufacturers and communications service providers, we tentatively conclude that compliance with any ALI requirement should be implemented in three steps.</p>	<p>We generally agree that services which can be used to report to 911 centers should provide ALI. However, many existing LB, VHF, and UHF radio services allow connection to the public network. These radio services would not be able to afford wholesale change-out of equipment designed to last 20-30 years. This would include Amateur Radio</p>

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<p>Under this approach, as a first step, wireless service providers would be required to design their systems so that the location of the base station or cell site receiving a 911 call from a mobile unit is relayed to the PSAP. If the base station or cell site employs a sectored antenna, the information relayed to the PSAP would have to indicate the sector that received the call. We seek comment on our proposal that wireless base stations be capable, within one year after the effective date of the order adopting rules in this proceeding, to route 911 calls with sufficient location information to permit connection of the mobile station to the PSAP closest to the mobile caller. It appears that this limited ALI information, at a minimum, should indicate the location of the base station receiving the 911 call and, if sectored antennas are employed, the direction (sector) of the mobile unit from the base station or cell site. We seek comment on this analysis, and on the means of transmitting this information to the PSAP, i.e., network elements, information protocol standards, location information updates, and speed of transmission. Compatibility seems to require that these features be passed through the PSTN to the PSAP in a manner and format capable of being used by those facilities. We seek comment on whether the proposed rule allows licensees and equipment manufacturers sufficient time to develop these features, and on the technical and cost considerations involved in implementation.</p>	<p>and business band radio. The cost to benefit ratio in these types of service would be prohibitive and an unnecessary burden.</p> <p>Additionally, temporary radio and PBX installations must be exempted from the requirements. For example, a disaster response PBX installed for a few months at a damaged commercial building should not be required to provide ALI information.</p>
<p>50. In the second stage, the associated base station or cell site should be capable of relaying more precise information. Specifically, we propose to require that, three years after the effective date of the order adopting rules in this proceeding, the ALI information provided to the PSAP must include an estimate of the approximate location and the distance of the mobile unit from the receiving base station or cell site, calculated on the basis of the received signal strength or by some other method. If a signal is received by more than one cell site, we assume the site at which the signal is strongest becomes the controlling site for the call. We seek comment on whether this assumption is correct. We ask that commenters address whether more precise location identification requires identification of the cell site only or identification of a specific base station. We seek specific and detailed analysis of the technical and cost considerations involved in such implementation, and of the time provided to licensees and equipment manufacturers to develop these features.</p>	<p>No comment.</p>
<p>51. In the third phase, we propose to require that, five years after the effective date of the order adopting rules in this proceeding, the mobile station be located in a 3-dimensional environment within a radius of no more than 125 meters. This information should enable the PSAP to assist emergency services personnel by providing a relatively precise location for a 911 caller using a wireless service e. Even greater accuracy could be necessary in urban environments to determine the precise location of a caller within a multistory structure. On the other hand, location information consisting only of latitude and longitude may be sufficient for radio transmitters operating outside of an urbane environment. We request comments on the feasibility of this approach both technically and economically, and on whether the rules propose an appropriate time frame for implementation of these features. Commenters should provide detailed and specific analysis of and support for their conclusions. We ask whether more precise location</p>	<p>Satellite and radio spectrum signals will not be able to penetrate many locals sufficiently to effect a "lock" adequate to calculate position. This is especially true of building structures and tunnels where fill-in repeaters are used for a particular technology, such as cellular, but not for the associated GPS signals. This is particularly problematic for the Handheld PCS user and mobile units moving in multi-path fade environments.</p>

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<p>requirements should be specified in the rules. Commenters should provide analysis demonstrating the feasibility of any proposed requirements. Commenters should also provide specific time periods for various industry segments and feasibility analysis if they recommend more rapid phase-in than the three stage approach proposed in this Notice.</p>	
<p>52. Re-ring/call back. We request comment on the technical and economic feasibility of wireless services to provide the capability to return calls placed from mobile radio transmitters to a 911 emergency number immediately. We propose to require that, within three years of the effective date of the order adopting rules in this proceeding, wireless systems must provide PSAP attendants with the capability to call back the 911 caller if the call is disconnected. We seek detailed analysis of existing and potential capabilities of wireless services to provide information that permits immediate call back to the mobile user. For example, commenters should indicate whether at present when emergency calls are dialed to 911, the PSAP sees the call as originating from a mobile radio subscriber. It appears that many types of mobile radio units, such as cellular, transmit ANI for subscriber billing purposes, and that this information does not pass to the PSAP. We seek comment on whether the directory number of the mobile unit, the subscriber's billing number, or some other number must be transmitted to the PSAP to provide call back capability, or whether call back to the mobile unit may be accomplished by other means. Ideally, this feature would represent a seamless process whereby any return call from the PSAP is connected directly to the mobile unit that originated the call. We seek comment on the technical feasibility and cost to licensees and equipment manufacturers of implementing immediate call back, and request comment on whether the proposed rule provides sufficient time to develop such a feature.</p>	<p>No comment.</p>
<p>53. Common Channel Signaling. The Joint Paper concludes that radio transmissions of 911 calls eventually should be capable of providing the same or similar information and features currently available from wireline calls over enhanced 911 systems. In addition to the ALI and call back information discussed above, the adoption of this performance criterion would require providers to ensure that some or all of the following information is furnished to the PSAP:</p>	<p>No comment.</p>
<ul style="list-style-type: none"> - Call back number and the mobile transmitter subscriber's name - Location of call origination (ALI), as discussed above - Class of service, e.g., residence, business, etc. - Base station provider's name and telephone number - Priority of the caller, e.g., hospital, school, etc. - Routing information to direct the call to the proper PSAP (primary and secondary PSAP identifiers) - Transfer numbers, i.e., separate numbers to allow transfer of calls to police, fire and ambulance services 	
<p>We request comment on the feasibility of these features, which would permit</p>	<p>Language identifier should be included where possible. SS7 standards must be addressed. Again, competitive</p>

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<p>radio transmission systems to interface fully with enhanced 911 systems. We also propose to require that common channel signalling capabilities be implemented within three years after the effective date of the order adopting rules in this proceeding, and we request comment on this proposal and timetable. In addition, we seek comment on whether the reliability of 911 technology will be hampered if 911 services are transferred to common channel signaling, and on how these features would affect the survivability of 911 SS7 based calls during a common channel signaling outage. We note that the Network Reliability Council has recommended that, before 9-1-1 calls are handled by SS7, standards bodies must determine whether additional standards are needed for SS7 protocol.</p>	<p>forces dictate that SS7 is an OPTION, not a mandatory inter-switch message protocol. Many switches in the nation are not capable of SS7 nor will they be in the foreseeable future.</p>
<p>54. Access to text telephone devices (TTY). We propose that, within one year of the effective date of the order adopting rules in this proceeding radio services must be capable of permitting access by individuals with speech or hearing disabilities through means other than mobile radio handsets, e.g., through the use of a TTY device. To the extent radio services are accessible to TTY devices today, those services will be able to provide access to 911 service. It is not clear from the Joint Paper or the record what Commission rules or policies would be necessary or appropriate to ensure access to 911 services for TTY-like devices beyond the general requirement that services be compatible with such devices. We seek comment on how to ensure access to 911 service by TTY-type devices that use wireless services, and request comment on the specific additional features, costs and feasibility issues that may be relevant to achieving compatibility.</p>	<p>No comment.</p>
<p>55. Equipment Manufacture, Importation, and Labeling. We seek comment on an approach that would permit wireless providers to employ whatever technologies achieve the required objectives. Features such as ANI and ALI might be implemented in a variety of ways. For example, while we anticipate that mobile equipment would generally need to include equipment to determine and transmit location information, it is feasible that other methods may be used, such as the type of technology described by KSI, that do not require such features to be included in the mobile transmitter. Nevertheless, we solicit comments as to whether it may be necessary to establish specific requirements for base and mobile transmitters to ensure compliance with the objectives of this proceeding, particularly with regard to ANI and ALI. Further, we request information as to what those standards should be. If specific requirements for transmitters are necessary, we contemplate requiring the submittal of information demonstrating compliance as part of the equipment authorization process. We also invite comment as to whether it may be appropriate to establish cut-off dates for manufacture, importation and marketing of equipment that may not meet the standards and how much time should be allowed for transitions to equipment that meets the new requirements. Comments are requested as to whether it may be appropriate, within 30 days after the effective date of the order adopting rules in this proceeding, to require equipment that does not meet the proposed requirements to be labeled with the following statement on the device and on the outside of the packaging in which it is marketed:</p>	<p>Private network radio equipment, such as that used for emergency restoral or in private campus systems must be exempt from this requirement. Additionally, this requirement must not be allowed for in-band voice signalling systems. The current pollution of FSK identifiers on voice radio networks impair the usefulness of the original intent of the radio; to communicate! This issue must be examined service by service.</p>

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<p>You may use this transmitter to dial for help through 911. The person answering may not know where you are, or how to call you back, unless you accurately provide your location and your full telephone number, including area and/or roaming codes.</p>	
<p>V. ADDITIONAL CONSIDERATIONS</p>	
<p>56. Privacy. We seek comment on the necessity for, and implications of, imposing privacy requirements on information transmitted to local exchange carriers and PSAPs in the delivery of 911 emergency services. In adopting federal rules for carriers that provide calling number identification services, the Commission declined to apply privacy protection requirements in circumstances which did not appear to raise serious privacy implications, including calls within private systems and calls to emergency.</p>	<p>Again, careful consideration must be given as to who maintains the ALI database in a competitive local loop environment. This information is competitively sensitive. Even the disclosure of who a subscribers local carrier is may be harmful to competition.</p>
<p>57. The states, however, have adopted varying approaches to the privacy afforded a subscriber's name, address, and telephone number when that information is used in the delivery of emergency services. For example, Florida, Georgia and Iowa prohibit the release of information, other than the name, address, and telephone number of the caller, obtained in the delivery of emergency services. Iowa, South Dakota, and Wyoming waive state privacy requirements for nonpublished numbers for the purpose of delivering emergency services. We note that while the provision of emergency services is essentially local in nature, the use of mobile radio transmitters to place 911 calls may involve emergency service providers located in more than one jurisdiction. Moreover, there is an important national interest in preserving uniform accessibility to 911 services. We ask commenters to address whether there are privacy interests in information transmitted by wireless service providers pursuant to the delivery of emergency services, and if so, what specific measures are appropriate to protect those interests.</p>	<p>No comment.</p>
<p>58. Compatibility with Network Services. We ask whether other steps need to be taken to ensure the American public continues to have access to effective 911 services. For example, private network services offered by telephone companies are not accessible simply by dialing 911. Instead, as with PBXs, an initial "9" first must be dialed. We ask parties to comment on whether rules should be adopted to require such services to permit access simply by dialing 911. In addition, it appears that not all telephone companies provide priority for 911 calls in accessing the central office switch, prior to being sent to the 911 tandem. We seek comments on whether we should impose uniform requirements. Commenters should discuss any jurisdictional issues that might be raised by imposition of such standards.</p>	<p>Priority of calls in the public network is of concern and is not a small technical issue. Any requirements developed must allow for a many year implementation as generics is stored program switches are not necessarily changed often. The situation is much worse for electromechanical switches. Perhaps the use of new network features like "crankback" would help.</p>
<p>59. Preemption. We believe that our proposed rules imposing uniform requirements for compatibility of enhanced 911 systems with wireline equipment and wireless services are consistent with our responsibilities under Section 1 of the Communications Act to promote safety of life and property. The Commission</p>	<p>One comprehensive and fair federal regulation is what is needed. Otherwise, the multiplicity of standards at the state level will create undue hardship on manufacturers to constantly modify their generics to meet ever-changing requirements. The federal government may even be required to fund the initial development by manufacturers to meet a new standard.</p>

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<p>has the authority to preempt state regulation that affects interstate service when it is not possible to separate the interstate and intrastate components of the service, or when state regulation thwarts or impedes a federal policy. We seek comment on any potential conflicts between our proposed rules and existing state regulation affecting PBX equipment or wireless services. Commenters opposing preemption should suggest specific alternatives for ensuring that inconsistent federal, state, and local requirements do not thwart the nationwide goal of achieving compatibility with enhanced 911 systems.</p>	
<p>VI. CONCLUSION</p>	
<p>60. For the reasons set forth above, we seek comment on all aspects of this Notice of Proposed Rulemaking and the specific proposed rules set forth in Appendix C. Our objective is to ensure that the American public continues to have access to effective 911 services. In the Notice of Proposed Rulemaking, we propose rules to ensure compatibility of PBX equipment with Enhanced 911 systems, including procedures for verifying that the location of callers using PBX equipment is received at the appropriate public safety answering point. We seek comment on whether these proposals permit sufficient flexibility in conforming PBX equipment to the needs of their owners while ensuring that the locations of callers to 9-1-1 are properly identified to PSAP operators. In addition, we seek comment on proposals that wireless service providers ensure that mobile radio units supplied to their customers provide the same level of access to 911 emergency services as is generally available to wireline customers. We request comment on the technical and economic feasibility of making wireless services compatible with enhanced 911 services, and on whether wireless service providers should implement the following features: 911 access communicating call origination information; providing priority handling of 911 calls; and forwarding sufficient information to the 911 exchange to provide call back capability, location information, and determination of the type of emergency service needed. We seek comment on whether or what privacy considerations should apply to the provision of enhanced 911 services. Finally, we seek comment on whether additional steps are necessary to ensure that the benefits of 911 services are not diminished by new developments, including comments on what additional rules should be proposed to ensure universal 911 access policies, and for an analysis of jurisdictional issues that might be raised .</p>	<p>No comment.</p>
<p>VII. ORDERING CLAUSE</p>	
<p>61. Accordingly, pursuant to Sections 1, 3, 4, 5, 201-205, 208, 215 218, 226, 227, 302, 303, 313, 314, 332, 403, 404, 410, 602 of the Communications Act of 1934, as amended, 47 USC §§151, 153, 154, 155, 201-5, 208, 215, 218, 226, 227, 302, 303, 313, 314, 332, 403, 404, 410, 602, IT IS ORDERED that NOTICE OF PROPOSED RULEMAKING is hereby provided to amend §§68.1, 68.3, 68.106, 68.228, 68.308, and 68.320 of the Commission's rules, 47 CFR §§68.1, 68.3, 68.106, 68.228, 68.308, 68.320, as indicated above and in Appendix C</p>	

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APPENDIX C - PROPOSED RULES

Part 68 of the Commission's Rules and Regulations (Chapter 1 of Title 47 of the Code of Federal Regulations, Part 68) is proposed to be amended as follows:

1. The authority citation for Part 68 remains as follows:

Authority: Sections 1, 4, 5, 201-205, 208, 215, 218, 226, 227, 302, 303, 313, 314, 332, 403, 404, 410, 602 of the Communications Act of 1934, as amended, 47 USC §§151, 154, 155, 201-5, 208, 215, 218, 226, 227, 302, 303, 313, 314, 332, 403, 404, 410, 602.

2. Section 68.1 is proposed to be amended by deleting the present §68.1 in its entirety and substituting the following:

§68.1 Purpose. - The purpose of the rules and regulations in this part is to provide for uniform standards for the protection of the telephone network from harm caused by the connection of terminal equipment and associated wiring thereto, for the correct operation of terminal equipment with public emergency access networks, and for the compatibility of hearing aids and telephones.

3. Section 68.3 is proposed to be amended by inserting, according to the alphabetical order of the term defined, each of the following definitions among the definitions already present:

This section does not address the issues of competitive local loop providers who may broker other providers services, provide complete or partial networks themselves, or other combinations of reseller/provider combinations. There are currently 5 or 6 local loop providers now in the formerly exclusive Rochester Telephone territory as of this writing.

Enhanced 9-1-1: A telephone network feature that automatically provides emergency response agencies with telephone directory number and location information on calls placed to the national emergency number, 9-1-1.

Enhanced 9-1-1 compatibility: The ability to relay a number associated with each served emergency response location.

Enhanced 9-1-1 emergency services trunk: Any 2-wire or 4-wire telephone connection that provides access to Enhanced 9-1-1 service.

The definition "trunk" is not adequate to describe the necessary Class 5 LINE or Trunk side connection which must be accommodated for practical access solutions. It is imperative that PBX 911 access NOT BE RESTRICTED to only trunk-side switch connections in Class 5 or 4 offices. It is possible that, if regional tandem connections are required, that PBX owners would be required to have 1 or 2 trunks, costing perhaps \$500.00/month, to these tandems so access to the 911 center could be obtained. This is an unfair and unnecessary burden on the owner to accommodate the occasional 911 call.

Dispersed private telephone system: A PBX or similar multiline telephone system whose connection to the telephone network carries emergency calls from more than one emergency response location.

Emergency response location: A specific site, corresponding to a calling station in a dispersed private telephone system .

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Restriction: The blocking of specific dial codes and sequences during call initiation.

3. Section 68.106 is proposed to be amended to read as follows:

§68.106 [Amended]

(f) Dispersed private telephone system trunk and station number verification for Enhanced 911 purposes. Customers who install dispersed private telephone systems after [insert date 18 months after effective date of order adopting rules in this proceeding] shall provide the telephone company with:

The “telephone Company” term, in its usage throughout this document, is not adequate to describe the service providers who provide “dial tone” to local subscribers. These public dial tone providers switching systems may interconnect to the existing public network, be carried on their own network, or be carried on leased networks. Their interconnection for local 911 service is yet to be determined and may, or may not be, a trunk side connection to the existing telephone companies network. As ATM and other packet transmission protocols, and media such as direct connect fiber, SONET, and other high capacity media are deployed, the cost to break-out a specific 911 interface such as a “4-wire E/M” circuit for a specific PBX is too costly.

(1) The number of trunk connections desired.

(2) The number of stations that may originate emergency calls.

(3) The number of, and identification of emergency response locations that will require number identification.

(4) The FCC Registration Number of the equipment being used. The telephone company will provide 10-digit numbers for the identified emergency response locations.

The items 1-4 above completely ignore the issue that the “telephone company” is no longer a monopoly and thus cannot itself dictate interconnection requirements. The “telcos” of today don’t own the numbers they currently have. Number portability completely destroys the premise that a particular NNX is associated to a geographic region, therefore keeping dual number assignments (DID and 911 ANI) databases current is going to be a severe problem. The Rule must allow for appropriate interconnection decided by competitive forces. For example, why should PBX owners, private switch network owners or emerging public network providers, such as cable companies, be required to provide trunking to and through their competitors networks (such as an RBOC), when they can provide the necessary 911 access themselves. The proprietary database requirements alone preclude sharing customer information with existing 911 database providers (local telcos). Additionally, why perpetuate an administrative nightmare of dual numbers (PBX DID and 911 ANI) when the whole idea is to provide “real” information. Why not provide the PBX DID and station number, or the PBX LDN and station number, to the PSAP? Doesn’t that solve the call-back number issue; eliminate the dual number bureaucracy; make the station ID an automatic instead of manual process; keep NPA and NNX numbers in circulation that would otherwise be wasted trying to identify PBX stations; and generally help out with the competitive issue? The PSAP would get the ALI plus DID number for call-back or the LDN number for the PBX attendant and ALI for the site as a minimum even under today’s public network technology. The Commission can then set timelines (more than 18 months) to upgrade to actual station number and location information. This need could be met by the PBX itself or adjunct equipment and delivered over a dial-up or dedicated data line directly from the premise to the 911 computer, or appropriate Host, in real time. This delivery method has the advantage of being up to the minute accurate and puts the burden of accuracy where it belongs, on the PBX owner. Additionally, it eliminates the competitive customer information sharing issue.

Section 68.228 is proposed to be added as follows:

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§68.228 Enhanced 911 trunk and station number verification.- (a) Verification requirements.

This entire section creates an unnecessarily costly bureaucracy. There is no reason that individual public carriers cannot have their own databases connected to the 911 centers computers. Further, there is no reason why dial-up connection cannot be made to existing and future databases by authorized vendors or PBX owners who would themselves be responsible for changes. Appropriate passwords and log tapes would provide an audit trail of changes for legal (and billing) purposes.

(1) General. The proper transmission of station number identification (SNI) for the station dialing the emergency number 911 shall be verified as part of initial installation and subsequent changes in emergency response location data.

The verification process can be virtually automatic by assigning a test verify code (any NXX number) which would access a computerized verification system which would provide pass-fail feedback.

(2) Station Number Identification. The 10-digit station number identification transmitted for 911 calls shall be verified to:

Why 10 digits? Why not the LDN or Billing number and extension number for PBXs? The costly dual number fiasco could be eliminated as the nation converts to digital switches. Even existing digital switches could accommodate this digit requirement for either the trunk or line side connection with some generic modification. See also the general comments above for this section.

(i) be in the group of station numbers assigned to the trunk by the telephone company and,

(ii) be assigned to the specific emergency response location of the corresponding calling station.

(b) Verification personnel. Work associated with the verification of Enhanced 911 emergency services trunk operation shall be performed under the supervision and control of a supervisor as defined in paragraph (c) of this section. The supervisor and installer may be the same person.

(c) Supervision. Work by installation personnel shall be performed under the responsible supervision and control of a person who:

(i) Has at least 6 months of on-the job experience in the installation of telephone terminal equipment;

(ii) Has been trained in the operation of Enhanced 911 emergency services trunks and in the performance of operations need to verify proper identification procedures and results.

(iii) Or, regardless of compliance with paragraphs (c)(1) and (c)(2) of this section, is a licensed professional engineer in the jurisdiction in which the installation is performed .

This section would imply that a licensed civil engineer could make these changes and not need to know anything about telephony. Additionally, many very competent telephone engineers are not licensed PE's. This section should be completely removed.

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All of the above personnel issues, the costly sending of signed data sheets to clerks and translations personnel, etc. can be avoided by requiring the person who makes the PBX/Network change that causes the record conflict responsible to correct it in the database. The legal (and moral) burden is then where it belongs. See other comments in this section.

(d) Verification procedure The installation supervisor shall provide written notification to the telephone company that the required verification tests have been performed, including the following information:

(1) The responsible supervisor's full name, address and business telephone number; and

(2) The date when Enhanced 911 trunks will go into service, the date when the verification tests were completed, and a list of trunk identification numbers and station numbers verified.

Again, this is proprietary competitive information in today's local loop competitive world and cannot be passed around some public providers company. Some means of "third party administration" is probably going to be required to keep confidential and separate competing companies databases of customers and their locations. The local telephone company of today must be phased out of this database management role. It must occur immediately in areas of the country where local loop competition is already a reality.

(e) Verification of changes. Addition or deletion of Enhanced 911 data base entries will be cause for verification of operation.

3. Section 68.308 is proposed to be amended to read as follows:

§68 & 68.308 Signal power limitations.

(b)

(5)

[In the table "MAXIMUM ALLOWABLE NET AMPLIFICATION BETWEEN PORTS (A) (B) (E) (F)" should show that Enhanced 911 trunks operate with the same requirements as Public Switched Network Ports (2-Wire) by adding the words "Enhanced 911 trunks" after Public Switched Network Ports (2-Wire)" in the first box at the top of the second column from the right.]

Again, this definition section must allow for line-side Class 5 access for PBX's, other customer premise access technologies, including direct customer to 911 center data transmissions, and direct 911 center access by other competitive public carriers.

Section 68.320 is proposed to be added as follows:

§68.320 Enhanced 911 compatibility: technical standards. (a) Trunk interface. Enhanced 911 trunks are analog two wire or four wire channels supporting either E&M type 1 or E&M type 3 signaling.

We do not agree. This requirement, in concert with the many others, will require PBX owners to maintain two trunk-side network connections to some public networks providers tandem, at great expense and bureaucratic testing quagmire. A sizable metropolitan area could have thousand of dedicated trunks added to the public networks which the public or PBX owner must pay for. Why not use the existing Class 5 line-side PBX access "trunks", which are used every day, for the connection. Even now most analog central offices have been replaced with digital switches, and most digital exchanges could handle line-side ANI with some modification.