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CTIA
Cellular Telecommunications Industry Association

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

September 25, 1998

Ms. Magalie Salas
Secretary
Federal Communications Commission
1919 M Street, N.W., 2nd Floor
Washington, D.C. 20554

Re: **Ex Parte**
CC Docket No. 94-102 (E9-1-1)

Dear Ms. Salas:

On Friday, September 25, 1998, the Cellular Telecommunications Industry Association ("CTIA") represented by Randy Coleman, Vice President of Regulatory Policy and Law and Andrea Williams, Assistant General Counsel, met with Paul Misener, Chief of Staff, Senior Legal Advisor, Office of Commissioner Furchtgott-Roth, Federal Communications Commission. The issues discussed were CTIA's request for additional time for CMRS carriers to comply with FCC's rules governing TTY access to 911 over digital wireless systems, the progress of Wireless TTY Forum, technical challenges that the wireless industry is attempting to overcome, preliminary findings and research on trying to achieve "backward" compatibility between Baudot signaling and digital wireless technologies with minimal character error rates, a standardized test plan, and TTY performance standards and data solutions. Additionally, a copy of CTIA's filing requesting extension time was left with Mr. Misener. It is already filed in the docket.

Pursuant to Section 1.1206 of the Commission's Rules, an original and one copy of this letter and its attachments are being filed with your office. If you have any questions concerning this submission, please contact the undersigned.

Sincerely,

Terri Granison
Paralegal

Attachment

September 11, 1998

Mr. Daniel Phythyon
Chief, Wireless Telecommunications Bureau
Federal Communications Commission
2025 M Street, NW, Room 5002
Washington, DC 20554

Re: ***Ex parte*** **Communication**
Revision of the Commission's Rules to Ensure
Compatibility with Enhanced 911 Emergency Calling Systems
CC Docket No. 94-102

Dear Mr. Phythyon:

Since September 1997, the wireless telecommunications industry (wireless telecommunications carriers and equipment manufacturers), manufacturers of TTY equipment, emergency and relay service providers (9-1-1 and TRS), and consumer organizations that represent individuals who are deaf and hard-of-hearing ("Stakeholders") have undertaken intensive collaborative efforts through the Wireless TTY Forum ("TTY Forum") to provide viable solutions for TTY users to access 9-1-1 over digital wireless systems. These efforts have been documented in the Quarterly Status Reports submitted to the Commission on April 10, 1998, and July 10, 1998.[1] Based on the facts presented below and the documented test results in the Status Reports, CMRS carriers offering digital wireless services will not be able to comply with the FCC's rules governing TTY access to 9-1-1 over digital wireless systems by October 1, 1998.

In an effort to focus research efforts and resources to meet the Commission's October 1, 1998, compliance date, the TTY Forum has focused on trying to find acceptable short-term solutions while work continues to develop long term solutions, *i.e,* data solutions, for TTY users to access 9-1-1 over digital wireless systems. For short-term solutions, the TTY Forum has primarily concentrated on "backward" compatibility, *i.e.,* attempting to transmit 45.45 baud Baudot signaling over digital wireless systems.[2]

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[1] See In the Matter of Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, Quarterly Status Reports filed April 10, 1998, and July 10, 1998("April Quarterly Status Report" and "July Quarterly Status Report"). A Supplemental Status Report will be filed prior to September 30, 1998, and will include information and test results provided from TTY Forum Meetings 6 and 7.

[2] April Quarterly Status Report at 3; July Quarterly Status Report at 1-3.

While the TTY Forum has identified the technical challenges associated with backward compatibility, it recognizes that the majority of TTY users still rely on TTY machines equipped with 45.45 baud Baudot signaling as their primary mode of communication.[3] However, varied test results, a significant breakthrough isolating one source of the problem for one digital technology, *i.e.*, CDMA technology, and the need for TTY performance standards suggests that further research needs to be conducted as well as the development of technical guidelines and standards in order to provide both short-term and long-term technically feasible solutions.

It appears from the discussions at the TTY Forum that manufacturers are still in the testing phase of developing technically viable solutions which will allow TTY users to access 9-1-1 over digital wireless systems. There is every indication that no manufacturer of wireless digital handsets will have a commercially available product[4] by October 1, 1998. Without the appropriate equipment, it is technically and fundamentally impossible for wireless carriers to comply with the Commission's rules governing TTY access to 9-1-1 over digital wireless systems by October 1, 1998.[5]

The TTY Forum has provided preliminary test results and demonstrations on several potential methods for addressing "backward" compatibility between TTYs and the different wireless digital technologies. The goal is to achieve "backward" compatibility and at the same time minimize the character error rate, particularly in emergency situations. However, a certain character error rate is inherent with wireline and wireless, both analog and digital technologies, and TTY devices. The Quarterly Status Reports and the forthcoming Supplemental Status Report document and explain the activities undertaken by various participants of the TTY Forum not only in trying to isolate the source of the problem but also the factors that contribute to the variance in the character error rates.

The TTY Forum developed a uniform test script that manufacturers representing various digital technologies and at least one TTY manufacturer have used in their testing. Test results showed a wide variation in the character error rates among the various digital wireless technologies. Moreover, there is concern that the variation in test results may be partially the result of inconsistent test methods, inconsistent methods of evaluating test results among the various manufacturers, and inconsistent performance of various TTY equipment.

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[3] April Quarterly Status Report at 3-4.

[4] In its discussions with CTIA concerning the TTY Forum, the Wireless Telecommunications Bureau staff has indicated that commercially available means the product can be sold or made available to the customer at point of sale or shortly thereafter.

[5] See 47 C.F.R. § 20.18(c).

At the recent TTY Forum Meeting held September 8-9, 1998, the TTY Forum co-chair noted that while the initial effort of the TTY Forum was not to produce tests results, the Forum has moved to the point where testing is critical to gathering information and a standardized test plan should be developed. Accordingly, the TTY Forum in conjunction with the wireless digital technology groups are developing a consistent test method and method of evaluating test results.

In the event that equipment would not be commercially available by the FCC's October 1, 1998 compliance date, CTIA agreed at the July 1998 TTY Forum Meeting to establish an Ad Hoc Working Group to develop a proposed workplan with scheduled milestones.[6] In anticipation of the CTIA Ad Hoc Working Group meeting in September 1998, CTIA have had several discussions with its members concerning an approach to the TTY compatibility issues. Attached is a proposed workplan that CTIA has drafted with input from its members. While the proposed workplan was recently provided to the other Stakeholder groups, they have not had an opportunity to review and discuss the proposal within their respective groups. It is anticipated that the Ad Hoc Working Group will meet by the end of September 1998. *It is important that the Commission understands that the proposed workplan of the wireless telecommunications industry is a draft document and does not necessarily reflect the views of the consumer advocacy groups, TTY manufacturers or the PSAP organizations. Most important, the draft document needs the input from these Stakeholder groups before it is finalized.* Accordingly, additional time is needed for such discussions, finalization of a workplan, and implementation of that workplan.

Based on the foregoing, CTIA, with the support of PCIA, respectfully requests that the Wireless Telecommunications Bureau pursuant to its delegated authority grant an additional three-month extension from October 1, 1998, to January 1, 1999, for CMRS carriers to comply with Section 20.18(c) of the Commission rules.[7]

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[6] CTIA has requested each Stakeholder group to provide two representatives to the CTIA Ad Hoc Working Group. In addition to CTIA and PCIA representing the wireless industry, there will be one technical representative from each wireless digital technology group. The composition of the Ad Hoc Working Group will be: Consumers – 2, PSAPs – 2, TTY manufacturers – 2, Wireless Industry - 2 (CTIA & PCIA) , CDG (CDMA) – 1, GSM North America (GSM 1900) – 1, UWCC (TDMA) – 1, and iDEN – 1.

[7] Based on the discussions of the TTY Forum, there is the likelihood that the equipment necessary to provide TTY access to 9-1-1 over digital wireless systems will not be commercially available until after January 1, 1999. Accordingly, CTIA, with the support of PCIA, will also seek an additional extension of time from the full Commission.

If you should need any additional information concerning this matter, please do not hesitate to contact us.

Respectfully submitted,

Andrea D. Williams
Assistant General Counsel
Cellular Telecommunications Industry Association

Mary Madigan Jones
Vice President of External Affairs
Personal Communications Industry Association

Attachment (1)

cc: Dr. Dale Hatfield
Ms. Elizabeth Lyle
Ms. Meryl Icove
Ms. Pam Gregory
Mr. John Cimko
Ms. Nancy Boocker
Mr. Marty Liebman

PROPOSED WORKPLAN OF THE WIRELESS TELECOMMUNICATIONS INDUSTRY FOR TTY ACCESS OVER DIGITAL WIRELESS SYSTEMS

Since September 1997, the wireless telecommunications industry (wireless carriers and phone manufacturers), manufacturers of TTY equipment, emergency and relay service providers (9-1-1 and TRS), and consumer organizations that represent individuals who are deaf and hard-of-hearing ("Stakeholders") have undertaken intensive collaborative efforts through the Wireless TTY Forum to develop short-term and long-term solutions for TTY users to access 9-1-1 over digital wireless systems. While the TTY Forum's primary focus to date has been to find an acceptable short-time solution by the FCC's October 1, 1998, compliance date, the varied test results, a significant breakthrough isolating one source of the problem for one digital technology, and the need for TTY performance standards suggest that further research needs to be conducted in order to provide both short and long term technically feasible solutions. Hence, compliance by October 1, 1998, for a short-term solution for some digital technologies may be technically impossible.

The wireless industry is committed to continuing intensive collaborative efforts to provide viable and practical solutions for TTY access over digital wireless systems not only for 9-1-1 purposes but also to meet the industry's obligations under Sections 225 and 255 of the Communications Act of 1934, as amended. The wireless industry acknowledges that it cannot resolve this issue in a technical vacuum, and that the wireless industry must continue to work cooperatively with TTY manufacturers, the appropriate consumer organizations and organizations representing public safety answering points ("PSAPs") to resolve this issue. Accordingly, the wireless industry proposes the following workplan with scheduled milestones for developing and providing technical solutions for TTY users to access digital wireless systems.

PROPOSED WORKPLAN

I. **Assessment of Test Results and Development of Test Plan**

To date, the TTY Forum has focused on "backward" compatibility, *i.e.*, solving for 45.45 baud Baudot signaling. The TTY Forum provided preliminary test results and demonstrations on several potential methods for addressing "backward" compatibility between TTYs and the different wireless digital technologies. The TTY Forum has developed a uniform test script that manufacturers representing various digital technologies and at least one TTY manufacturer have used in their testing. Test results, however, indicate a wide variance in the character error rate. Furthermore, trying to isolate the cause of the problem within a short time frame has been a Herculean yet circumspect task with no conclusive results to date. While the goal is to minimize the character error rate, particularly in 9-1-1 situations, a certain character error rate is inherent with wireline and wireless, both analog and digital technology, and TTY devices. Moreover, there is concern that the wide variance in test results may be contributed by inconsistent test methods, inconsistent methods of evaluating test results among the various manufacturers, and inconsistent performance of various TTY equipment .

The wireless industry recognizes the need for the development of a consistent test method, a uniform method of evaluating the test results ("test plan"), and TTY performance standards to determine the minimal level of character error rate that TTY users can expect with certain digital technologies and certain TTY devices. To address this issue, the wireless industry proposes to do the following activities:

A. **Independent review and assessment of tests conducted to date.**

The TTY Forum has requested Dr. Dale Hatfield, Chief of the FCC's Office of Engineering and Technology ("OET") to review and assess the tests conducted to date. It is anticipated that Mr. Hatfield will provide guidance to the TTY Forum on the soundness of the research conducted to date and identify any discontinuity or gaps in such research that should be explored in the development of a consistent test plan, as defined below.

Primary Responsibility: Dale Hatfield/FCC OET
Completion Date: TBD

B. **Development of test plan**

In conjunction with the TTY Forum, the wireless digital technology groups[1] (CDG, GSM North America and UWC Consortium) shall develop a consistent test method[2] and method of evaluating test results ("test plan") for its respective digital technology (CDMA, TDMA, GSM 1900). The wireless digital technology groups shall seek input from technical experts that represent TTY manufacturers, PSAPs and consumer groups, *i.e.*, Gallaudet University. The wireless digital technology groups should also consider any guidance from Dr. Hatfield with respect to any discontinuity or gaps in research that should be explored in the development of a consistent test plan. Each wireless digital technology group will be responsible for distributing the test plans to their respective members.

TTY manufacturers, PSAPs and Gallaudet University shall make available their technical experts and any technical data necessary for the development of the test plan.

Primary Responsibility: TTY Forum, CDG, GSM North America, UWC Consortium; TTY manufacturers, PSAPs, and Gallaudet University
Completion date: mid-late September 1998

C. **Conduct tests using test plan and compare new results**

Member companies will conduct tests and submit results to their respective wireless digital technology groups for compilation, comparison, and any necessary modifications.

TTY manufacturers, PSAPs and Gallaudet University shall make available their technical experts, technical data and assistance necessary for manufacturers to conduct the appropriate tests.

Primary Responsibility: Individual manufacturers and carriers, TTY manufacturers, PSAPs, and Gallaudet University
Completion date: 30-45 days after receipt of uniform test plan

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[1] For purposes of the Workplan, wireless digital technology groups means the CDMA Development Group ("CDG"), GSM North America, and Universal Wireless Communications Consortium ("UWC Consortium").

[2] It is anticipated that the test plan will include the uniform test script developed by the TTY Forum.

D. **Presentation of test results derived from use of test plan**
The respective wireless digital technology groups will present the test results derived from the use of the test plan to the TTY Forum. Based on these tests results, the TTY Forum will reassess whether to continue pursuing "backward" compatibility, redirect research and development efforts toward providing data solutions or a combination.

Primary Responsibility: CDG, UWC Consortium, GSM North America, TTY Forum
Completion date: Subsequent TTY Forum Meeting

III. Development of Technical Requirements and Implementation Guidelines

The wireless industry acknowledges that the development of technical requirements and implementation guidelines cannot be accomplished in a technical vacuum. Compatibility means the ability of two products -- the digital wireless handset and the TTY device -- to co-exist in a digital environment. The wireless industry, PSAPS, TTY manufacturers and Gallaudet University must work cooperatively to provide technical requirements that will facilitate such compatibility, particularly for standard and modified voice-based solutions.[3]

A. **Development of technical requirements - digital wireless handsets**
Based on the test results derived from the test plan, each wireless digital technology group will provide the appropriate technical performance criteria and specifications that will allow TTY users to access 9-1-1 over digital wireless systems in accordance with the solution(s) selected by the respective wireless digital technology groups.

While 9-1-1 access is the immediate goal, each wireless digital technology group will also provide the appropriate technical performance criteria and specifications that will allow TTY users to access digital wireless systems for non-emergency calls in accordance with the solution(s) selected by the respective wireless digital technology groups.

Notwithstanding the foregoing provision, manufacturers and carriers that pursue data solutions based on proprietary technical

[3] It appears that data solutions may not require TTY users to depend solely upon existing TTY devices.

data are not obligated to share such technical performance criteria and specifications if the information is deemed confidential. Nothing in this provision shall prohibit or restrain wireless carriers and manufacturers from pursuing a proprietary technical solution that will provide innovative digital wireless technology to TTY users.

Primary Responsibility: Wireless digital technologies groups
Completion Date: TBD in implementation guidelines

B. **Development of technical requirements - TTY devices**
To facilitate compatibility as defined in the previous paragraph, the wireless digital technology groups are dependent upon TTY manufacturers willingness and commitment to develop performance standards for their respective TTY devices. Based on these requirements, the TTY manufacturers will develop a TID as an interim document to provide technical guidance to the respective digital wireless technology groups.

With the support of the TTY Forum, the TTY manufacturers will initiate a parallel effort with the appropriate standards setting body and will develop the appropriate SRD for TTY performance standards for submission at the next subsequent meeting of the relevant standard committee.
Primary Responsibility: TTY manufacturers, TTY Forum
Completion Date: [Seek input from TTY manufacturers re: reasonable dates]

C. **Development of technical requirements - PSAPs' equipment**
[Seek input from PSAPs]

D. **Development of user requirements**
At TTY Forum 6, the consumer advocacy groups offered a document that provides consumer approved criteria for acceptance of the proposal concerning "one phone model per service provider as of October 1, 1998." The purpose of the document is to stimulate discussion and solicit the view of the manufacturers and carriers. While it appears that the proposal is moot with respect to the October 1, 1998 compliance date, some of the listed criteria provides useful guidance to manufacturers and carriers in their efforts to provide technically feasible solutions for TTY users to access 9-1-1 over digital wireless systems.

The wireless industry acknowledges the consumers' request that essential features of a technical solution include: a) built-in vibrating ring signal or remote vibrator. (If hands-free adapter is used, the phone model should still vibrate.); b) volume control; c)

ability to pass through sounds on the line to the TTY so that the user can monitor ring, busy signal, etc.; c) a visual indication when call has been disconnected. Except for the standard voice-based solutions, the wireless industry will use its best efforts to include such features in some, if not all, technical solutions to the extent it is readily achievable to do so. This provision shall not prohibit or constrain manufacturers or carriers from offering functionally equivalent features or features that provide more advanced technology to TTY users.

Many criteria listed in the document concern marketing and customer care issues as well as pending regulatory issues before the Commission.[4] CTIA and its members believe that the TTY Forum is not the appropriate venue to address such issues since the TTY Forum primarily focuses on TTY access to 9-1-1 over digital wireless systems and many wireless industry participants in the TTY Forum do not have the authority to bind the wireless industry or their respective companies with respect to these issues. Moreover, CTIA and its members believe that it is more appropriate to address such issues in the context of Section 255.

Accordingly, CTIA plans to schedule a meeting in the near future with the drafters of the proposal to address these issues in the context of CTIA's industry approach to accessibility under Section 255.

E. **Development of implementation guidelines**

To ensure timely development and deployment of solutions, each wireless digital technology group shall develop implementation guidelines. These implementation guidelines shall include assigned tasks, proposed TIDs and SRDs if necessary, and projected timelines for completion of each assigned task. The implementation guidelines will be a living document that may need to be revised based upon test results and the need for additional research. If so, the wireless digital technology group will submit revised implementation guidelines to the TTY Forum for submission to the FCC.

Primary Responsibility: Wireless digital technology groups, TTY Forum

Completion Date: Initial Implementation Guidelines – the next subsequent TTY Forum Meeting. Subsequent Revisions – as necessary

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[4] See Criteria 2.0 through 5.0 of Consumer Approved Criteria for Acceptance of "One Phone Model Per Service Provider as of October 1" Proposal

IV. Development and Deployment

Individual manufacturers and carriers will develop the appropriate prototypes for the solutions that best supports their respective digital wireless technology and produces the minimum TTY character error rate. Individual manufacturers and carriers will conduct the appropriate field tests, *e.g.,* TTY Forum Benchmark/Validation Test. The results of these field tests will be compared and compiled by each wireless digital technology group for their respective digital technologies and will be submitted at the next subsequent TTY Forum Meeting. If necessary, manufacturers and carriers will make modifications based on shared test results. Manufacturers will complete implementation in the mobile handsets which includes product design, development and fabrication, and provide carriers with a commercial product(s).

Primary Responsibility: individual manufacturers and carriers; Field Tests – individual manufacturers and carriers, Gallaudet University (proposed); Wireless digital technologies groups
Completion Date: TBD in implementation guidelines

V. Technical Solutions

Test results derived from the use of the test plan may indicate that not all digital wireless technologies or all TTY devices can achieve compatibility with each technical solution listed below. To provide TTY users with a variety of solutions and to allow manufacturers and service providers maximum flexibility to develop innovative technology and services for TTY users, the wireless industry will provide a range of solutions[5] that will allow TTY users to access digital wireless systems. *While the wireless industry will attempt to minimize the character error rate, it cannot guarantee, at this time, a specific character error rate for any solution.*

A. Standard voice-based solutions[6]

The short-term goal is to provide TTY users *with access to 9-1-1* over digital wireless systems without defaulting to analog. Under standard voice-based solutions, each carrier will provide one compatible digital phone model, to be tested and used with a

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[5] Based on the test results from the digital wireless technology groups, each group should have the freedom to create solutions unique to their respective technologies. Thus, there should be a variety of unique solutions rather than limiting TTY users to three digital "flavors" for each solution.

[6] Examples of the standardized voice-based solution include, but are not limited to, the acoustic coupling method proposed by Ericsson at previous TTY Forums, and the Lober & Walsh adapted TTY and proposed interface presented at TTY Forum 5 and 6.

compatible TTY model, at a reasonable price, for each digital technology that the carrier offers. It appears that standard voice-based solutions can be achieved in the time frame listed below, *provided that* there are: 1) no major changes to the vocoder, 2) no new features added to the handset, 3) only one digital phone model per each digital technology, 4) cooperation from the TTY manufacturers to provide a range of audio input levels in TTY devices acceptable to certain digital wireless handsets, and 5) as noted above, no guarantees with respect to a specific character error rate.

While the standard voice-based solutions attempt to achieve "backward" compatibility with Baudot TTYs, this solution is dependent upon the TTY Forum's reassessment of research and development discussed in Paragraph 1.D.

Primary Responsibility: Individual manufacturers and carriers
Completion date: To Be Discussed[7]
Commercial Availability of Product: To Be Discussed[7]

B. **Modified voice-based solutions.**
For those wireless companies that plan to pursue an alternate or modified voice-based solutions via direct electrical connection, *e.g.*, RJ-11 connector, a 2.5 mm jack, etc., the TTY Forum is in the process of drafting and will make available a Technical Information Document ("TID").[8] In order to make this solution available in a timely manner, the wireless companies will need the cooperation of the TTY manufacturers to provide a range of audio input levels acceptable to digital wireless handsets.

With the support of CTIA and PCIA, the TTY Forum will initiate a parallel effort with the appropriate standards setting body and will develop a Standards Request Document ("SRD") for submission at

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[7] "Completion date" and "commercial availability of product" are contingent upon several factors, *e.g.*, the timely completion of the work outlined in Sections II, III and IV, additional research that may be necessary, commitment of the Stakeholders to participate in the proposed workplan, and unforeseen delays as a result of technical reasons. Target dates that allow flexibility due to the above factors will be discussed at the forthcoming meeting of the CTIA Ad Hoc Working Group.

[8] The Technical Information Documents referred to in this workplan will be used for information purposes to provide technical guidance to manufacturers and carriers until the development of a standard. The TID is not an endorsement of any particular solution or requirement and shall be used on a voluntary basis.

the next subsequent meetings of the standards committees of the respective digital wireless technologies. All Stakeholders of the TTY Forum will be expected to support efforts in the appropriate standards setting body.

Primary Responsibility: Individual manufacturers and carriers that plan to pursue modified voice-based solution via direct electrical connection; TTY Forum – TID; CTIA, PCIA and TTY Forum – SRD and shepherding through standards process
Completion Date: To Be Discussed[7]
Commercial Availability of Product: To Be Discussed[7]

C. **Data solutions**

Some wireless companies plan to pursue data solutions, *e.g.*, use of the V.18 standard, circuit switched data or proprietary, interactive data and text-messaging services. With the assistance of the wireless digital technologies groups, the TTY Forum will provide a TID for the V.18 standard and circuit switched data for those carriers and manufacturers that wish to pursue such data solutions. Some manufacturers and carriers plan to pursue data solutions for TTY users based on proprietary technical data.[9]

With the support of CTIA and PCIA, the TTY Forum will initiate a parallel effort with the appropriate standards setting body and will develop the appropriate SRDs for data solutions for submission at the next subsequent meetings of the respective standards committees of the various digital wireless technologies. Those manufacturers and carriers that plan to offer data solutions based on proprietary technical data are not expected to submit their proprietary information to the standards-setting process. All Stakeholders of the TTY Forum will be expected to support efforts in the appropriate standards setting body.

Primary Responsibility: Wireless digital technologies groups, CTIA, PCIA, individual manufacturers and carriers
Completion Date: To Be Discussed[7]
Commercial Availability of Product: To Be Discussed[7]

VI. **Notification to Subscribers and Potential Subscribers who use TTYs**

In compliance with the FCC's rules, wireless carriers have notified subscribers and potential subscribers that they may not be able to use

[9] The goal is to provide TTY users with a variety of data and text-messaging solutions. Rather than lock digital wireless technologies into one or two data solutions, the Workplan attempts to provide carriers and manufacturers with the flexibility to provide their TTY customers with a variety of solutions.

TTYs to access 9-1-1 over digital wireless systems. Wireless carriers, with the support of the wireless trade associations, the consumer advocacy groups, TTY manufacturers and wireless handset manufacturers, will continue to notify subscribers and potential subscribers at appropriate intervals until a product is commercially available.

Primary Responsibility: individual wireless carriers and manufacturers, TTY manufacturers, consumer advocacy groups, CTIA and PCIA

Completion Date: On-going

VII. Consumer Education

[TBD after the parties have the opportunity to assess their resources with respect to a concerted effort to educate TTY users regarding the use of wireless telecommunications, particularly transitioning the embedded base of Baudot TTY users to data solutions.]