

## WIRELESS SERVICES

### ■ Summary

- Low response rate from the commercial wireless industry to the Commission survey makes general conclusions difficult. Low response is cause for concern and might indicate risk of malfunctions.
- Larger commercial wireless providers have implemented plans for fixing Year 2000 problems, but have more work to do.
- Only half of the smaller wireless providers have a Year 2000 plan. Therefore, contingency planning is most critical.

### INTRODUCTION

The wireless communications community is the most diverse group in the communications sector. With over two million wireless licensees, the Commission has regulatory oversight over interests that range from the commercial services, such as cellular telephones, pagers, and radios used in taxis, to the use of radio equipment by state and local governments for public safety of life and property. In most parts of the country, about a half-dozen commercial carriers are providing wireless telecommunications service. Thus, if Y2K problems occur, alternative wireless service providers may be available to the general public.

This section focuses on commercial wireless services provided directly to the public and assesses their testing efforts, Y2K risks and contingency plans. Public safety communications used by police, fire, and emergency personnel are critical and are addressed in a separate Emergency Services Section to this Report. See page 90. This report does not assess Y2K readiness among the private wireless community. However, because of concerns about the Y2K readiness of all wireless entities, we have customized another survey that assesses the status of non-commercial wireless licensees. This should give a broader summary of the complete wireless industry's Y2K readiness.

We conclude that, in light of the poor response to our surveys by a large number of commercial wireless providers, especially smaller carriers, there is cause for concern about their Y2K preparedness, and possible associated risks to their customers. Because of this concern, the Commission is contacting companies again and will continue to do so in an effort to get information about their Y2K preparedness.

### COMMERCIAL WIRELESS TELECOMMUNICATIONS

#### Methodology of Assessment

The Commission conducted a survey that targeted a random sample of 300 commercial wireless entities, including licensees in the cellular service, personal communications services (PCS), specialized mobile radio services, and paging services. In addition, surveys were sent to the 12 largest carriers. Responses from the survey were collected in December 1998 and January 1999. For purposes of this report, operators that provide service to more than 500,000 customers are considered large carriers, and those that provide service to less than 500,000 customers are considered small carriers.

Thirty-one percent of all carriers surveyed provided responses to the survey. As a group, respondents provide service in every State and serve approximately 42 million customers. However, as of 1997, there were approximately 108 million commercial wireless subscribers. Thus, the responses received represent less than 40 percent of the entire wireless customer base. In view of this low response rate, the



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Commission has resurveyed those carriers who have not yet responded and will provide the results in future reports.

**Assessment**

**Overview**

The poor response rate may have many explanations. We have no choice, however, other than to classify the wireless sector as one at risk given the uncertainty of its efforts at this time. Both the Commission and CTIA repeatedly attempted to get better responses from carriers, but to no avail. Thus, we intend to increase our survey efforts and our education and awareness programs over the remainder of the year. These programs include seminars, mailings, additional surveys, and outreach programs through industry association programs.

We note that industry associations such as the Cellular Telephone Industry Association (CTIA) and the Personal Communications Industry Association (PCIA) are also assessing and facilitating Y2K remediation and preparedness efforts. In September 1998, CTIA released a report on the readiness of the cellular and PCS industries. This survey reported that wireless carriers in general have Y2K task forces in place and have a target date for completion of efforts of the second quarter of 1999. CTIA also reports that it is engaged in industry testing efforts in order to facilitate inter-network testing. The data collected from the Commission's survey efforts will be compared to the CTIA's Y2K Report (and any updates as a result of testing efforts).

According to PCIA, wireless carriers have made Y2K considerations an integral part of their network planning and operational activities for the past several years in light of the fact that PCS networks are new and messaging carriers are substantially expanding and upgrading their networks to support new, high-speed protocols and to make other technological improvements. As a result, PCIA reports that much of the plant in place was designed after the Y2K bug was identified and was Y2K compliant when deployed. It reports that many companies now require software and hardware vendors to certify Y2K compliance in purchase orders and contracts, and have programs in place to verify compliance. PCIA indicates that small carriers are working with the manufacturers to determine the extent of their Y2K problems. While encouraging, we note that the fact that the equipment is new is not a guarantee that it is Y2K compliant.

The Commission's Year 2000 survey revealed that approximately 54 percent of the total respondents, both large and small, have implemented a Year 2000 remediation plan or process (Figure 1). However, 100 percent of the large carrier respondents have a remediation plan. For these responding carriers, all will have remediation plans completed before December 1999 (see Figure 3).

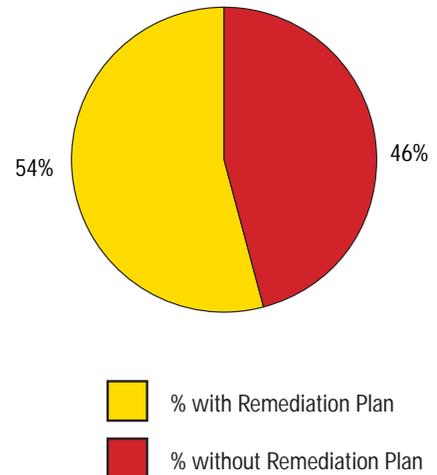


Figure 1. Total Responses

Given the low response rate and the late completion dates estimated, there is reason for concern. Greater effort should, therefore, be devoted to contingency or backup plans in the event of system malfunctions.

The results of the survey of commercial wireless licensees are summarized in the following two charts. Figure 2 (chart of all respondents) shows the percentages of completion of the various steps in the overall plan for fixing the Year 2000 problem, shown respectively by network elements, support systems, and auxiliary systems. Figure 3 shows the average estimated completion dates for the steps of the overall plan. The completion rates for network, support, and auxiliary systems range from a low of 28 percent to a high of 83 percent.

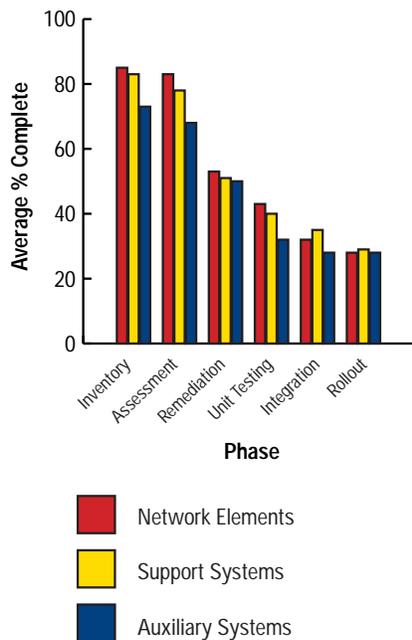


Figure 2.

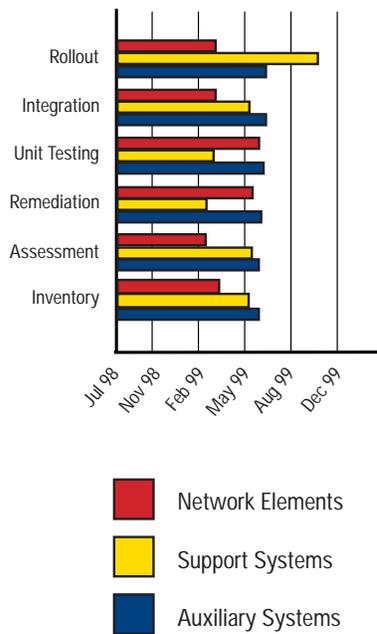


Figure 3.

### Survey Responses by Size and Components

The following discussion reviews Year 2000 readiness results by size of the wireless carrier and by components of the overall wireless network. The charts below summarize results according to carrier size.

#### Network Elements

Network elements are defined as those systems, components, or software that directly affect communications transmission and reception, including:

- Data/messaging systems — Interface (interconnection) to the Public Switched Telephone Network (PSTN), transmitters, control transmitter, and subscriber/customer receivers or pagers.
- Mobile telephone systems — Wireless systems such as cellular, broadband PCS, and multi-channel base stations designed to provide radio telecommunications services to mobile stations. Examples of network elements are interfaced to the PSTN, base stations, cell sites, Mobile Telephone Switching Office (MTSO), microwave links, and subscriber units.

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Commercial wireless operators have focused primarily on mission critical network elements that may be adversely affected by Y2K problems and that ultimately may be responsible for disruptions of wireless services to their customers. The mobile switch located at the MTSO is the network element that could cause major disruptions to the two-way mobile systems if it fails due to Y2K problems. Mobile switches in the larger wireless systems have been upgraded periodically to increase capacity.

However, there is some concern for the smaller rural systems. They may still have their original switches since their customer base has not increased as rapidly as the customer base in the larger systems.

All large carrier respondents are currently implementing remediation plans for network systems. All network elements except for integration and rollout are over 65 percent complete (see Figure 4). All phases of the overall plan for large carriers are estimated to be completed by May 1999 on average (see Figure 5). Large entities that responded to the survey appear to be implementing a timely, practical plan. Small carriers that are implementing a remediation plan report on average that only the inventory phase and assessment phase are over 50 percent complete for network elements (see Figure 6). Therefore, it appears that small carriers are starting remediation implementation much later than larger carriers. However, small carriers estimate that they will be completed with network elements on average before July 1999 (see Figure 7). The main concern continues to be for those small carriers that were not implementing a remediation plan at the time of the survey.

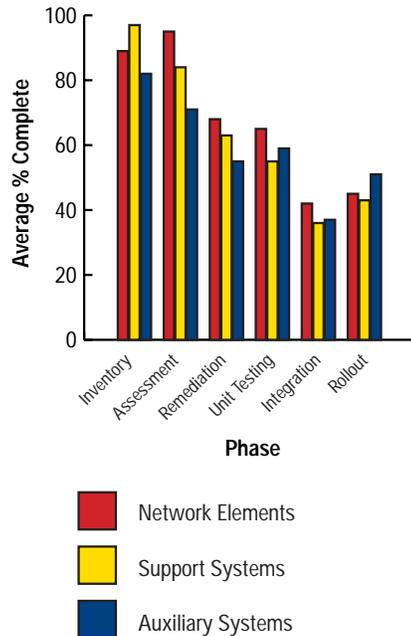


Figure 4.

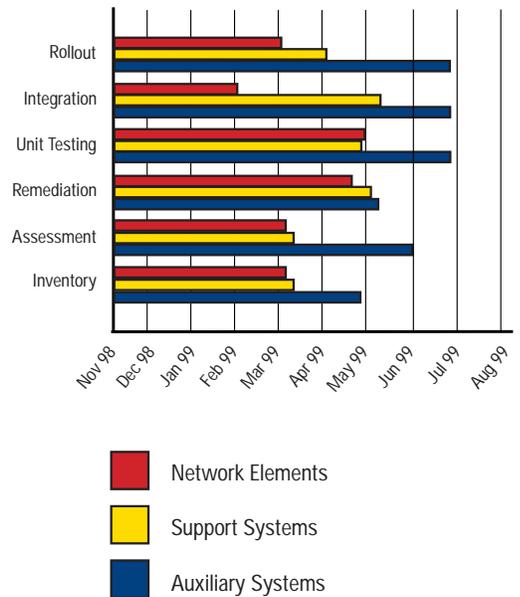


Figure 5.

**Support Systems**

Support systems are defined as operations support and administrative maintenance systems (such as maintenance support, billing, anti-fraud systems, parts ordering, primary power, and backup power). These systems provide important support functions such as operating power, access to and control of the call information to be used for the flow of important financial information, and system security. For



example, if the billing system fails, it may not allow calls by authorized subscribers to be completed. Failure of the anti-fraud systems may leave the network vulnerable.

All large carrier respondents are currently implementing a remediation plan. Large carriers appear to be making appropriate remediation plans for support systems. All support systems except for integration and rollout are over 50 percent complete (see Figure 4). All phases of the remediation lifecycle for large carriers are estimated to be completed, on average, by July 1999 (see Figure 5). Large carriers that responded to the survey appear to be implementing a timely and practical plan for support systems.

Small carriers that are implementing a remediation plan report on average that only the inventory phase and assessment phase are over 50 percent complete for support systems (see Figure 6). Therefore, it appears, again, that small carriers are starting remediation implementation much later than larger carriers. Support elements for small carriers will be completed on average before September 1999 (see Figure 7). This is a matter of concern — September 1999 is a very late date because unforeseen problems or delays can develop during each phase of remediation. However, the larger concern continues to be for those small carriers that were not implementing a remediation plan at the time of the survey.

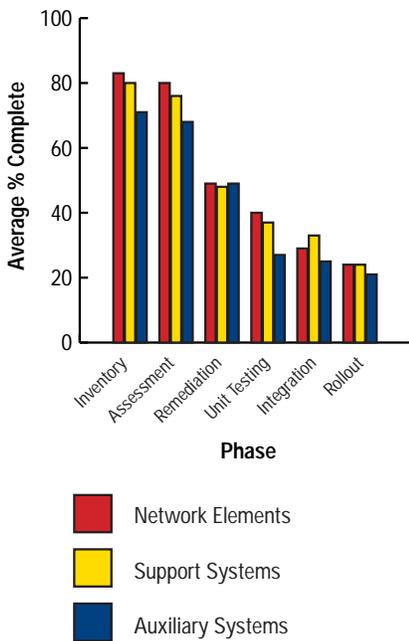


Figure 6.

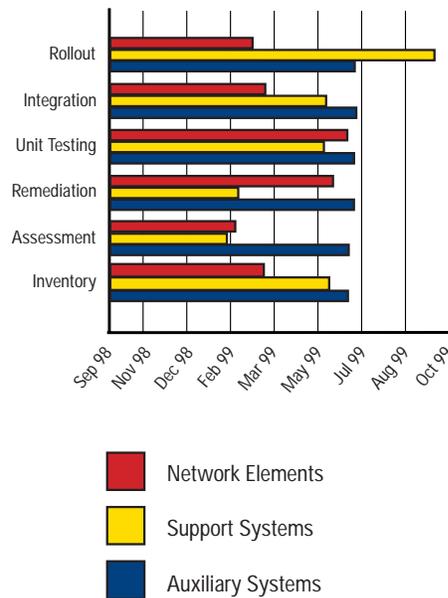


Figure 7.

### Auxiliary Systems

Auxiliary systems or components include such items as payroll, human resources, backup systems (including auxiliary power supplies), security and alarm control systems, and environmental control systems (including heating, ventilation, and cooling systems). Although these systems are not directly involved in the processing of calls and financial or call-based data, failures could burden management of the commercial wireless system, and in the longer term lead to system performance problems. For example, a failure in one or more of the components, such as building access or air conditioning, could lead to the degradation of the system's ability to process calls over time.



All large carrier respondents are currently implementing a remediation plan. They appear to be making appropriate remediation plans for auxiliary systems. All auxiliary systems, except for the integration phase, are over 50 percent complete. All phases of the remediation lifecycle for auxiliary systems of large carriers are estimated to be completed, on average, by July 1999. Large carriers who responded to the survey appear to be implementing a timely and practical plan for auxiliary systems.

Small carriers that are implementing a remediation plan report on average that only the inventory and assessment phases are over 50 percent complete for auxiliary systems. Therefore, it appears that small carriers are starting remediation implementation much later than larger carriers. However, auxiliary elements for small carriers will be completed on average before July 1999. Small carriers may complete remediation plans faster due to the smaller size of the systems compared to the larger carrier system. Therefore, those small carriers that are implementing a remediation plan will likely be prepared for year 2000 with respect to auxiliary systems. However the main concern continues to be those small carriers that are not implementing a remediation plan at the time of the survey.

#### *Additional Assessment Data*

Based on the survey responses, it appears that a large portion of the wireless commercial industry is currently working with suppliers on Year 2000 issues. Eighty percent of the respondents indicated that they had done so, while only 9 percent indicated that they were not working with suppliers. (Eleven percent of the respondents did not answer this question.) Working with suppliers is a very important step to ensure operation through the critical date change and continued operation thereafter.

Overall, the responses indicate that the commercial wireless industry is satisfied with vendors and customers. Fifty-one percent of the responses to this question indicate moderate satisfaction, while 49 percent indicate that they are very satisfied with their vendors and customers. Vendors are a vital resource in the assessment of equipment and software. Vendors are often the only means to gain Year 2000 information concerning specific components of a system. Some of the respondents commented on the difficulties of outages lasting more than four or five days. Several respondents are concerned that the vendors do not have any sense of urgency in responding to Year 2000 inquiries.

The data collected appears to indicate that the wireless industry has the majority of the necessary resources to plan for the Year 2000. In response to the Commission's inquiry, over 73 percent did not indicate that they lacked any resource. Approximately 9 percent of the total respondents claimed a shortage in personnel, 16 percent in information, and 5 percent in monetary resources. Only a small number of respondents were more descriptive by stating that they need help with complete solutions.

Approximately 45 percent of the respondents have begun or plan to conduct joint testing with their customers and vendors, with some indicating that they are using contractors to conduct testing and complete remediation. We do not, however, have tangible test data to report. Forty-one percent of the respondents indicate that they are not doing joint testing and 14 percent of the respondents did not complete this question. The Telco Year 2000 Forum has been established to facilitate testing. This forum consists of labs and operators to assist in joint planned testing. More information concerning this forum can be found at their website at [www.telcoyear2000.org/primary.htm](http://www.telcoyear2000.org/primary.htm).



## CONTINGENCY PLANNING

Wireless networks are made-up of small, complex systems that work together to complete wireless communications tasks. It is difficult to predict the results of Year 2000 problems on these types of systems. Therefore, contingency planning — i.e., having backup plans in place in case something goes wrong — is an important step in becoming Year 2000 ready. According to the survey, approximately 42 percent of the respondents have begun contingency planning. The following analysis of contingency planning is broken down by size of carriers.

### Large Carriers

Approximately 64 percent of large carriers surveyed have begun contingency planning. Those respondents that have begun to develop plans average less than 50 percent completion (see Figure 8). Large carriers' preparation of contingency plans average less than 40 percent for all elements (see Figure 8). Respondents' analysis of risk and failure were to be completed on average by January 1999 except for network elements that will average completion by March 1999 (see Figure 9). Respondents' average completion for contingency preparation is April 1999 except for electric power with average completion in May 1999. However, those that are not implementing a contingency plan or assessment of probability of risk are of major concern.

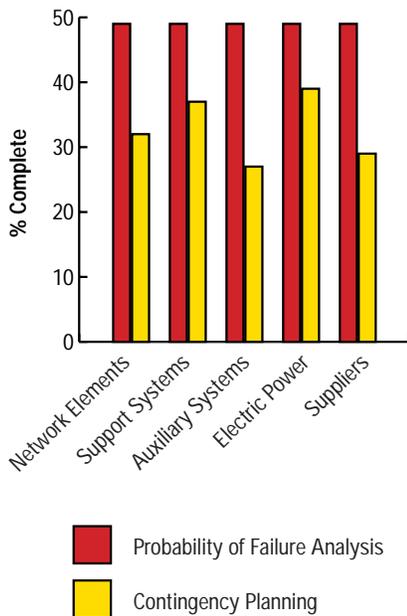


Figure 8.

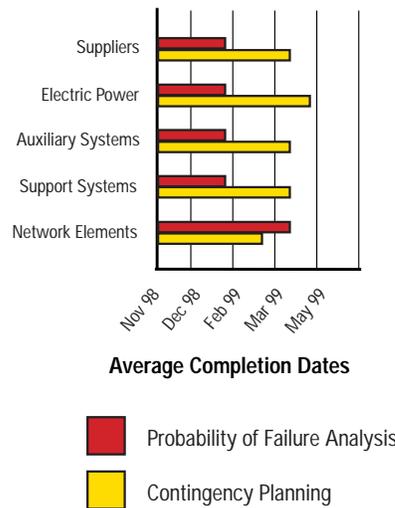


Figure 9.

### Small Carriers

Only about 40 percent of the small carrier respondents have begun contingency planning. These respondents average about 70 percent completion of probability of risk assessment for all items (see Figure 10). Small carriers' preparation of contingency planning averages less than 50 percent for all items (see Figure 10). Respondents' average completion date for analysis of risk and failure is May 1999, except for suppliers, which have an average completion of April 1999 (see Figure 11). Respondents' average completion for contingency preparation is April 1999 for all phases (see Figure 11).



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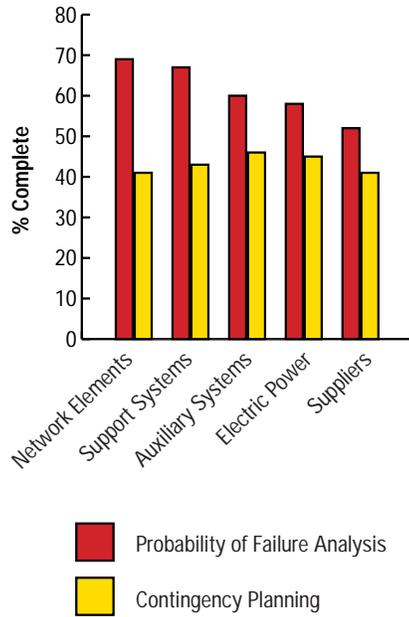


Figure 10.

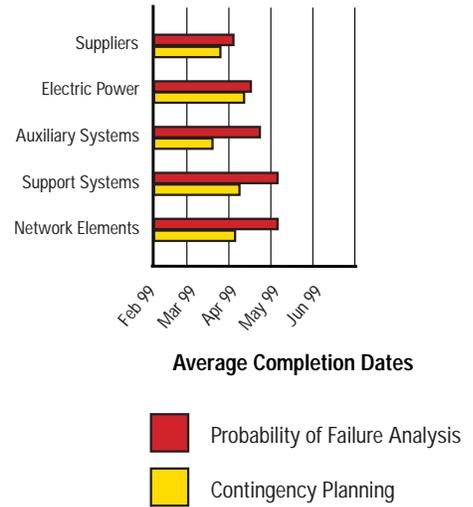


Figure 11.

### CONCLUSIONS AND REMAINING CONCERNS

Commercial wireless licensees are strongly influenced by competitive pressures, including Y2K risks, and certain factors or concerns have emerged that potentially could affect a wireless licensee's own motivation and ability to deal with the Y2K problem. For example, cellular, PCS and paging providers would be influenced by related risks such as the loss of revenue, customers and reputation for reliability. While all large commercial wireless carriers that responded to the survey have implemented a Y2K remediation plan or process, only about half of the other operators serving less than a half-million customers have implemented such a plan. As the Commission has recognized from the beginning of this process, solutions for the Y2K problem have to come from the licensees themselves. The low response rate to the survey from wireless carriers, especially smaller carriers, may be cause for concern about their Y2K preparedness, and possible associated risks to their customers.

**Consumer Tips**

- Fully charge your wireless phone batteries prior to January 1, 2000.
- Contact your service provider to see if your equipment is Year 2000-ready.
- Not all wireless services will be a good alternative to wireline communications because of dependency on wireline communications. Call your wireless service provider to find out if your provider can be an alternative to wireline communication.
- Roaming (use of your wireless service outside of your home calling area) may be disrupted. Though the wireless system you directly subscribe to may not experience any disruptions to service due to Y2K, this does not necessarily mean the "roaming partners" your provider has made arrangements with will have the ability to provide the same disruptionless service.

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