

TRANSPORTATION AFTER Y2K: CAN WE GET THERE FROM HERE?

HEARING BEFORE THE SPECIAL COMMITTEE ON THE YEAR 2000 TECHNOLOGY PROBLEM UNITED STATES SENATE ONE HUNDRED FIFTH CONGRESS SECOND SESSION

ON
DEFINING THE SCOPE AND SEVERITY OF THE YEAR 2000 PROBLEM IN
THE TRANSPORTATION INDUSTRY

SEPTEMBER 10, 1998

Printed for the use of the Committee



Available via the World Wide Web: <http://www.access.gpo.gov/congress/senate>

U.S. GOVERNMENT PRINTING OFFICE

51-127 CC

WASHINGTON : 1998

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, DC 20402

SPECIAL COMMITTEE ON THE
YEAR 2000 TECHNOLOGY PROBLEM

[Created by S. Res. 208, 105th Cong., 2d Sess. (1998)]

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THURSDAY, SEPTEMBER 10, 1998

U.S. SENATE,
SPECIAL COMMITTEE ON THE YEAR 2000
TECHNOLOGY PROBLEM,
Washington, DC.

The committee met, pursuant to notice, at 9:32 a.m., in Room SD-192, Dirksen Senate Office Building, Hon. Robert F. Bennett (chairman of the committee), presiding.

Present: Senators Bennett, Smith, and Dodd.

OPENING STATEMENT OF HON. ROBERT F. BENNETT, A U.S. SENATOR FROM UTAH, CHAIRMAN, SPECIAL COMMITTEE ON THE YEAR 2000 TECHNOLOGY PROBLEM

Chairman BENNETT. The committee will come to order. This is the committee's sixth hearing on the Year 2000 technology problem. And as in our past hearings which we have held on energy, utilities, health care, telecommunications, and financial institutions, I think we have assembled an excellent set of witnesses. I compliment the staff and thank the witnesses for their willingness to be here.

I look forward to the help of the witnesses in defining the scope and severity of the Year 2000 problem in the transportation industry. Today we are going to explore the obvious safety and convenience concerns for the traveler as well as the potentially paralyzing effect the millennium bug could have on businesses that are increasingly reliant on technology, and just-in-time inventories and prompt transportation of manufactured goods to the marketplace.

We will also be releasing the results of a staff survey on the transportation industry that is very disturbing. We will lead off with that in our testimony. Let me begin by noting the obvious which is that transportation is the life line of our global economy. Everyday thousands of American corporations and businesses depend upon air, rail, maritime shipping, trucking and mass transit to deliver safely, reliably, and economically millions of people and goods essential to their operations.

There are 13 major and over 50 regional U.S. airlines, 7 long-haul and more than 500 short-haul railroads, over 80,000 trucking companies, about a dozen U.S.-flag-maritime shippers, and about 6,000 transit agencies that generate more than \$500 billion in revenues. And more importantly, they support businesses generating many billions more in revenues. A Year 2000 related disruption

within transportation could be more debilitating than any major corporate strike.

I am concerned that the transportation sector as a whole may not be able to transition through the millennium without major disruptions. That is not to say that most of the individual companies that make up the sector are not working hard to correct the problem. It is rather that the interdependencies of these companies and their partners and suppliers, both foreign and domestic, make the transportation sector extremely complex, and thus the Year 2000 issue is very difficult to address.

And one example of automation in the transportation sector is the global positioning system, GPS. Simple receivers such as this one have revolutionized navigation in maritime shipping. This device makes it possible with pinpoint accuracy, and I assure I did not do it [Laughter].

So it is probably correct, makes it possible to determine one's location anywhere in the globe and I can tell you that this hearing room is precisely at 38 degrees, 53 minutes, and 32 seconds north latitude, and 77 degrees, 00 minutes, and 21 seconds west longitude. It makes me sound like I really know what I am talking about. GPS use is increasing everyday in the transportation industry to track freight, trucks, rail cars, and stranded motorists. However, while the satellites and ground stations will be ready, there are over 60 manufacturers of receivers like this one used in thousands of applications, and we cannot be sure which of those manufacturers will have the hand-held systems Y2K ready. This one is likely to be because we borrowed it from the military, but the proliferation of the use of these devices is one example of how dependent on technology transportation has become.

Now I will share with you some of the complicated Year 2000 issues facing the transportation industry. If tomorrow were the Year 2000, the airline industry would not be ready. This does not mean that airplanes would fall out of the sky. That is one of the myths that has come around about the Year 2000, but there are serious problems facing the industry and first and foremost, of course, is flight safety. Jane Garvey, whom we will hear from today, shoulders the herculean task of making sure that the FAA's systems, air and ground traffic control, will be ready for the Year 2000.

But that is only part of the airlines' problems. The airlines, airports, and all of the suppliers and partners that they depend on must also be ready. Critical systems such as aircraft maintenance, passenger ticketing, reservation systems could fail and cause reduced capacity, flight delays, cancellation and consumer discord. Airport runway lighting systems, firefighting equipment, building and jetway security systems, parking systems, or even the pipeline that supplies jet fuel to the eastern seaboard could all cause closure of some of our busiest airports if Year 2000 problems are not aggressively addressed and solved.

I am concerned because the survey being conducted by the Air Transport Association shows that 38 percent of the airports surveyed do not have a Year 2000 plan. The other transportation modes also have serious Year 2000 problems. Maritime ships have over the years become more highly automated as have the ports

and equipment used to offload cargo. It is of no use to have the ship arrive on time and be unable to be unloaded or unable to dock. Many shippers are concerned about whether the U.S. Customs Service systems used to clear freight will continue to operate and ensure the uninterrupted flow of imports and exports, and then they are also concerned about the ability of the Coast Guard to ensure safe operation within ports if their systems are not Y2K ready.

Let me take the opportunity to clear up another Y2K myth, one frankly that I have helped spread out of ignorance for a little while until I became better informed. The railroads assure us that the computers can be overridden and that rail switches can indeed be manually switched in contrast to earlier reports by individuals who said that could not happen. Nonetheless, the railroads face significant challenges with their train control systems as well as their dispatching and scheduling systems.

City officials face significant problems with traffic lights, easy-pass toll systems, traffic monitoring systems that help us avoid gridlock in cities. The New York Transit Authority, which we will hear from today, has 6 million riders a day, and they must address Y2K issues in mass transit, bus and subway ticketing systems as well as systems integral to the operation of the subway itself.

Finally, we are releasing today the results of a survey conducted by the committee staff to assess the overall preparedness of the transportation sector. We undertook this survey because as is the case in previous hearings, we found that such assessments are not available from any other source, public or private. And the charts displayed show the results of the survey and frankly they are a little disturbing.

First, we targeted a total of 32 airlines, airports, railroads, maritime shippers, trucking companies, transportation, metropolitan transit authorities and so on, and despite well over 100 phone calls to offer assistance and encourage results, which probably made us into something of a pest, particularly to those who were helping us, only 50 percent responded. That is the 16 companies whose results are displayed on the table and, of course, the results of the survey will be available to everyone.

We made the survey simple. I can only conclude that those who did not respond were either unaware of the severity of the problem or embarrassed on their lack of progress. Now, as you can see from the table, if you get into the details—I recognize that in the audience you cannot read it from there, but we will have a summary for you—only one-third of the companies who responded—understand what I am saying here now—only half of the people we went after responded, and only one-third of those that responded have completed assessment of their systems. This is a task that should have been finished a year ago.

In addition, only one-half, again only one-half of those that have responded have begun any contingency plan. Keep in mind that we went after the leaders in the industry, those with vast resources. So presumably those that we did not survey are behind those that we have. And this gives us great pause. The hard part is yet to come: the testing and final implementation of Y2K solution. And I

am forced to conclude that there may be significant interruptions in the transportation industry.

I have often said that the three places I do not want to be on January 1, 2000 are in an airplane, a hospital or an elevator. I think maybe Ms. Garvey can make me feel a little bit better about the airplane in U.S. airspace. I still do not want to be in an airplane overseas. But I have not changed my mind fully. I hope the witnesses today will help me do that.

To summarize better than I have the findings of this survey, we have asked Paul Hunter, who is on the professional staff of NASA, and he is a detailee to the committee—and we are very grateful that NASA has made him available to us—to give us a snapshot summary of the survey and the points that it made. Mr. Hunter, if you would proceed.

**STATEMENT OF PAUL HUNTER, PROFESSIONAL STAFF,
SPECIAL COMMITTEE ON YEAR 2000 TECHNOLOGY PROBLEM**

Mr. Hunter. Thank you, Senator. As you pointed out, this is the work of the committee staff. I have prepared some brief oral remarks but we have prepared a more detailed written assessment we would like to submit for the record.

[The prepared statement of Mr. Hunter and the survey results can be found in the appendix.]

Mr. Hunter. The committee undertook this survey because as you mentioned, it is very difficult to get a cross-cutting and thorough analysis of any of these sectors of the economy that are susceptible to Y2K problems. So we attempted to try to—

Chairman BENNETT. Pull the microphone a little closer.

Mr. Hunter. Excuse me, Senator. We attempted to obtain a snapshot of the readiness of the major players in the transportation sector. Our approach to do this was to conduct a confidential survey of major players in significant segments of the transportation industry which would include the airlines, the airports, railroads, shipping, trucking firms, and the metropolitan transit authorities. As you mentioned, we did attempt to target 32 organizations, which was roughly about 5 or 6 per significant transportation mode and, as you also mentioned, we had received, as of yesterday afternoon a total of 16 responses.

Now if I may refer to the charts that are on the left side of the room, my left side, from left to right, these charts are a summary of the survey. The survey was actually 21 questions and this survey is similar to the survey that was released on the utility industries. As we promised anonymity, we only identify companies by company type. Then from left to right, there is a column for the date that they became aware of Y2K problems and the date that they established their formal projects. There is a question as to whether or not they have completed their assessments and identification of how many of their systems they identified as mission critical.

Then we touched upon the partnership and relationships aspects of the Y2K problem and we asked them whether they have been contacting their service providers and vendors. Next, we touched upon the legal and liability issues, and this question was a little bit more narrowly defined than general legality. The question was

more to the effect are you concerned that a failure on the part of a service provider or partner will lead to legal liability on your part?

We then asked whether or not contingency plans were complete at this time, whether or not they had been contacted by creditors or investors on their Y2K preparations and plans, and then finally will they finish on time?

The response rate, if I might briefly summarize, was that about 62 percent of them had not at this time completed their assessment phase, which is disturbing, given that we have a little bit over 15 months before midnight December 31, 1999, and for point of reference, the Office of Management and Budget had directed the Federal agencies to complete their assessments by June 1997, over 1 year ago. So if we use the Federal guidelines for comparison, we would consider that given the lack of assessment being completed at this time, these parties are very late.

I also point out that no respondent has completed their contingency planning, but even worse the reports indicate that over half had not even begun their contingency planning. This is significant. It indicates that they will be very late making contingency decisions. Fifty percent of the returns indicated some expectations of lawsuits and as I mentioned, it is more common to expect a failure from this survey on the part of a partner or service provider than on self-failure.

We also captured the total Y2K costs of 15 of the 16 parties and they reported a total of over \$650 million for these 15 parties. We actually anticipate that being somewhat low although these are the figures reported. One of the reasons for this statement is that we saw wide variations in the costs. We actually discussed this with a few of the people/parties during the interviewing process in preparation for these hearings, and we found differences in the way that Y2K cost accounting is done.

We asked the parties surveyed what would they recommend that the Congress do to get the country and the transportation sector ready for the Y2K millennium change? The most common response was a request for safe harbor or good samaritan legislation to protect those parties that are sharing information on the Y2K problem from product disparagement and other types of lawsuits. The next most common request was some sort of liability protection for parties executing due diligence in preparing for the Y2K event.

Finally, there were several times that it was mentioned that Congress should promote the discovery and dissemination of valid and accurate Y2K information such as you just did in your opening remarks with regard to the railroad switches. And then the last item that was mentioned more than one time was that Congress should continue oversight of Federal agencies, power utilities, telecommunications, and other service providers that are in general very important to a broad cross section of the country.

That concludes my remarks, Senator. I will be happy to take any questions you might have.

Chairman BENNETT. Thank you very much. We appreciate that and stay available because we may very well have questions for you.

We would like to go now to our panel of witnesses. Because the transportation sector is so diverse, we have had a difficult time selecting the witnesses because we could have so many. We have talked to over 100 people in preparation for the hearing, and we think we have assembled the right set of formidable witnesses. We have invited witnesses from some of the biggest stakeholders in the transportation world and some with the best Year 2000 programs in the history.

We have tried to be as objective as possible in our hearings and not resort to finger-pointing. We have on occasion perhaps made some witnesses a little uncomfortable and that is not our purpose; we are not trying to beat up on anybody. I must say that I feel disappointment at some corporations who were invited to come and for whatever reason decided that they would not come, and because I do not want to beat up on anybody I will not use any names. But the problem is so serious and involves the nation, indeed the world, in such a serious way that I am disappointed when someone who does have information that could be shared with this committee and through the committee with others decides that they will not participate when invited.

And I would hope that the absence of representatives from these companies genuinely indicates a busy schedule rather than demonstration of where they think the importance of Y2K really is. We will revisit the transportation issue next year and I would hope these people would then respond to an engraved invitation and I would expect that they would then appear.

Now having said that, I want to welcome today's witnesses. As I said, we are very pleased with the group that we have assembled and very grateful that each one of them is willing to come be with us. We will begin with Hon. Mort Downey, Deputy Secretary of the Department of Transportation, and Mr. Downey has been asked to set the scene for the hearing by discussing the level of automation in the transportation industry. Sir, we are very grateful to you for your willingness to do this and welcome you to the committee.

STATEMENT OF HON. MORTIMER L. DOWNEY, DEPUTY SECRETARY OF TRANSPORTATION, DEPARTMENT OF TRANSPORTATION

Mr. DOWNEY. Thank you, Mr. Chairman. It is a pleasure to be here and certainly we value the relationship we have with the committee in working on this issue which we really have to be in a partnership to achieve what we need to do.

Chairman BENNETT. Excuse me. I should make the point that Senator Dodd, the vice chairman of the committee, is having transportation problems this morning.

Mr. DOWNEY. Hopefully we did not cause them.

Chairman BENNETT. I do not know who caused them, but with the wonders of modern communication, he can tell us what we would have guessed a few years ago: he is stuck in traffic and will be here as quickly as he can. Go ahead, sir.

Mr. DOWNEY. Thank you, Mr. Chairman. And I have a written statement that I would like to provide for the record, if I could just summarize it.

Chairman BENNETT. Without objection.

Mr. DOWNEY. I think a hearing like this will be very helpful in our efforts in getting awareness of the problem, especially at the senior management levels in the American corporations and public agencies. That is the key really to success is getting senior management committed to the progress that needs to happen.

There are many, many, as we know, computer-based improvements to our transportation system that have been put in place over the last two decades. They have made it far more efficient. Just-in-time deliveries, intelligent transportation systems, improved highway flows—most mornings—a lot of things have been done to make the systems safer and even more things will happen in the future, but all of them put the Achilles heel in place of the Y2K problem: will they continue to function or will they be a burden when the Year 2000 comes? That is why we put such a high priority within our Department to dealing with the issue.

Just to summarize quickly where we are within the Department although I know the focus is primarily industry, we are making good progress. Our assessments are complete, have been complete for many months. We have completed repair of our own systems to the extent of 46 percent of the Department's mission critical systems. They are renovated, they are tested, they are certified. Our inspector general has reviewed them and given us comfort that it is done, and we believe we will substantially meet the next milestone which is 100 percent completion or renovation by September 30, leaving us the balance of the time before next January to focus on testing and on implementation, which really has to be going forward.

All of our senior administrators in the Department, and you will hear later this morning from Ms. Garvey, are committed to this as their top priority. The Secretary and I are personally involved in it, and as I said, our inspector general is being very much a part of the team in assuring that whatever we are reporting, whatever we are saying, is, in fact, a fair representation of the situation at the time. So that when we issue a report to you or to OMB, this is documented and verified and hopefully gives us the direction where we need to go.

But our broader concerns and something that now we feel that we have got the Department, at least, in a management sense moving forward, is what happens broadly in the system. We are working with other Federal departments through John Koskinen's council, which I personally participate in, to get all of the Federal agencies in all of the sectors recognizing their interrelationship, recognizing the steps we have to do.

We have safety regulatory authority. In most of our modes it focuses on results. We do not tell precisely step by step a railroad or a transit agency how to assure safety in their system, but we want to be sure that they are doing the right things, and this is another area where we need to be sure they are proceeding. That requires awareness. It requires corporate responsibility. We are now conducting outreach, as you have done, to identify progress in the transportation sectors and to determine how best we can support their repair efforts.

Let me summarize some of the cross-cutting issues. As your survey found as well, many private companies are reluctant to report

or share information out of fear of liability. So surveys are incomplete or sometimes over-optimistic. Some sectors, airports and shipping in particular, are just emerging in their awareness of the problem, which means we need to do more in the way of outreach. Foreign airlines and foreign shipping companies, especially those from less developed parts of the world, are particularly limited in the steps that they have taken, and they are also short of the resources to deal with the problem.

Many large enterprises, and I certainly include all of the U.S. airlines in that category, have their active repair programs in place, but like small businesses in other sectors many transportation suppliers and smaller operators are behind the curve. Our dependence on other sectors such as energy and telecommunications also means that even if we had all of our job done, we still may have transportation problems. That is one of the reasons why the President's Council is looking at broad-based contingency plans, not just Energy saying it is not our problem or Transportation saying it is not our problem. We recognize it as a mutual problem. We need to deal with it in that way.

Finally, in terms of cross-cutting issues, there has been uncertainty about embedded chips in all of the transportation uses, and while we certainly cannot say we have run them all to the ground, in most cases in the transportation equipment and transportation systems, the chips seem to be event oriented. They focus on operating cycles. How many times has the engine been started? How many times, how many hours has the aircraft flown, as opposed to dates, so that while we are not out of the woods completely, we think this will be less of a problem than we had first anticipated but not totally resolved as yet.

We are taking steps to assist our partners. As I said, we have met with industry associations, with businesses in every sector. We have held forums on aviation, on maritime, on rail, on pipelines and on surface transportation. And we will do more of that as the year goes on. We have reached out globally through the global aviation and maritime organizations. The Secretary has raised the issue at the European Conference of Ministers of Transport. He has raised it in his travels in Africa. I raised it in Asia earlier this year. So we are doing outreach with other countries. We will have a Year 2000 transportation website. We have issued a brochure of guidance for the operators of intelligent transportation systems, the traffic control systems, identifying what they should do.

We have issued guidance with respect to the use of Federal highway and transit and airport funds and where those dollars are made available to States, to localities, to airport operators. There are uses for Y2K compliance that are permitted and we are certainly encouraging those agencies to use our dollars to get this job done. There are other things they might want to invest in. They will always have a second chance at those. They will not have a second chance at getting the system fixes in place.

You referred to the global positioning system earlier. We have been working with the Defense Department. We at DOT are the liaison with Defense on all civil uses of GPS. We have found that the safety certified receivers are Y2K compliant, will work. They also will work through next August rollover of the date on the GPS

satellites, but some of the lower-end consumer receivers may be a problem. We are advising users through our Coast Guard outreach that they should contact manufacturers. This is an area certainly where better ability to share information will be very helpful. We would like to be able to broadly make that information available.

We are working on contingency plans with each of the modes and we will use our existing authority where necessary to ensure transportation safety. If we have to step in to restrict or even shut down operations because we are concerned about safety, that will be our first priority in any mode of transportation.

Let me conclude with some comments, as requested, what Congress might do that could help in the partnership to get this done. I certainly would hope that Congress will pass the proposed good samaritan legislation. We have heard this from a number of people in the transportation sector. They need that protection to be able to share information. The ability to share information will be critical in resolving the issues.

I also certainly hope that Congress will enact the president's proposed contingent emergency funding supplemental to meet needs over the next year for our internal activities. It will give us the flexibility to respond not only to what we know we need to be but to things I am certain we will find that we need to do over the coming year.

And third, I would ask that Congress be cautious in considering any new legislation to mandate specific steps. It is too late. It would be too late for us to issue regulations to say how to do this or to pass laws how to do it. We really need to work with industry on how to achieve the response. And also that we consider the impact of any other legislation on the Y2K effort. I have just issued a memo within the Department saying with respect to any new regulations that we have in the pipeline, analyze their impact and be sure we are not putting a burden on industry that takes away their attention from solving this problem. So if there are things that would require system reprogramming and they are postponable, we are saying make them effective late in 2000, early in 2001, but do not dilute the effort on compliance.

And finally, Congress and the administration and business leadership have to continue the effort to raise awareness with our constituencies, with the general public. If we do that, if we do, as you have done this morning, give assurances where rumors have begun to spread, that we knock those down, but also pay attention to what really needs to get done, it is a major effort. I am certain we will not get 100 percent of it all across the country in every transit system, in every railroad, in every operation, but I think we will get enough to maintain the flow of commerce, the convenience of moving passengers, and most importantly the safety of the system which I think has to be our first goal and we certainly look forward to working with you, Mr. Chairman, on this issue.

[The prepared statement of Mr. Downey can be found in the appendix.]

Chairman BENNETT. Thank you very much. That was very helpful. Let me comment on the congressional issues that you raised. On the good samaritan legislation, we have given the assignment on this committee to Senator Kyl, who sits on the Judiciary Com-

mittee, and he reports to me that there is good progress. We do expect that there will be some kind of legislation moving out of the Judiciary Committee very quickly.

This committee, as you know, has no legislative authority. We can only recommend to the legislative committees, but Senator Hatch will be introducing a bill, I am told by Senator Kyl, and it will maybe even move without a hearing out of that committee as quickly as possible.

Mr. DOWNEY. We certainly would like to help as much as we could on that.

Chairman BENNETT. Yes. We feel good about that. The funding supplemental, of course, we are very focused on, and one of the advantages of this committee is that we have both the chairman and the ranking member of the Senate Appropriations Committee.

Mr. DOWNEY. And a key member of our Appropriations Subcommittee as well.

Chairman BENNETT. Yes. And it always helps to have that kind of pipeline into the appropriations process. Finally, I congratulate you on your willingness to put a moratorium on new regulations. The SEC has announced the same thing with American businesses, that the SEC will not be issuing any new regulations for now until the Year 2000 that would require diverting resources from the Year 2000 problem to reprogramming for those regulations. And I am delighted that you are doing the same kind of thing and congratulate you on that.

Mr. DOWNEY. If we have any issues where a safety matter would require the issuance of a reg, we would do it, but other than that it is clearly something that we would like to postpone.

Chairman BENNETT. Just an editorial comment. We may discover in the whole Government that the moratorium on regulations is a good idea, quite separate and apart from Y2K. Sorry. I could not resist that.

We have been joined by Senator Smith and Senator Dodd. And they arrived in that order. Senator Smith, do you have an opening statement?

Senator SMITH. I do, Mr. Chairman. I will not take the time to read it but would ask that it be included in the record.

Chairman BENNETT. Without objection.

Senator SMITH. I would just comment how pleased I am that Union Pacific is one of the companies here that will be testifying. I say that because this is a great company, a railroad that services 23 States. It has recently gone through a merger with the Southern Pacific. That merger has been more problematic than I think they ever imagined, in part over computer issues in merging two companies. So I actually think we can learn a great deal from their experience and the disruption that that has caused to inventories, employment, and backups all over this country. And I hope that they will speak to that because I think there are many lessons to be learned there. Thank you.

[The prepared statement of Senator Smith can be found in the appendix.]

Chairman BENNETT. Thank you. Senator Dodd, we announced that you were a case study for transportation problems this morning.

Vice Chairman DODD. Yes, classic one.

Chairman BENNETT. Classic one.

Vice Chairman DODD. Rock Creek Park.

Chairman BENNETT. We are delighted to have you. Do you have an opening statement?

OPENING STATEMENT OF HON. CHRISTOPHER J. DODD, A U.S. SENATOR FROM CONNECTICUT, VICE CHAIRMAN, SPECIAL COMMITTEE ON THE YEAR 2000 TECHNOLOGY PROBLEM

Vice Chairman DODD. Thank you, Mr. Chairman, and I do have a few remarks I would to share, but also let me commend you once again for the tremendous job you are doing here chairing this effort that is examining the full ramifications and aspects of this issue and, as you said on numerous occasions, our fervent hope is that this entire effort will prove that, in fact, nothing significant happened or happens on January 1, 2000, but I think most people would agree that one of the reasons that may be the case is because we have insisted that various sectors of our economy pay attention to this issue early, and as each day goes by, of course, the date gets closer. So I am particularly grateful to you for those efforts.

We had a series of very important and I think informative hearings up to this point covering utilities and banking, finance, telecommunications, and health care. They have been important, I think, and quite frankly, I have been heartened and at times concerned, both emotions, as to the level of the Year 2000 preparedness. Indeed, some agencies and some corresponding industries are well along their way to becoming ready for January 1, 2000. Yet, I think it is important that we state that very clearly, many are not or rather have been very slow to commit the necessary resources to meet this mammoth challenge.

The potential repercussions and disruptions due to inadequate Year 2000 preparation to our industry, commerce, and financial systems become readily apparent, I think, and are extremely important. However, there are some industries and sectors where a failure in mission critical systems is bone chilling. One of these areas became apparent during this committee's health hearing. In that hearing, you will recall the critical nature of medical devices, for example, whether a cardiac monitor would function, was apparent to everyone.

Today's hearing covers some similar critical ground. Perhaps the most frequently asked Y2K question concerns whether our airlines will fly and fly safely in the minute past midnight on January 1, 2000? However, inherent in this question is a thousand other questions that relate to airports, navigational systems, airline maintenance, airport security, just to name a very few. The transportation sector is not just whether or not our planes are going to fall out of the sky, but whether goods and services will get where they are needed when they are needed. A breakdown of the rail system, for example, means that food might not get from the farm to the grocery store. These are the kind of disruptions that we must begin to develop contingency plans for and to address.

Let me also add, if I can here, that just this week I received the Office of Management and Budget's—the committee did—most re-

cent progress report on Year 2000 conversion issues. The report tells us the Department of Transportation—you will, I know, know about this, Mr. Downey—has improved its management oversight and has accelerated the rate at which the FAA is remediating air traffic control system components, and the report indicates that at the end of July 1998, the Department of Transportation percentage of mission critical systems renovated stood at 65 percent, a significant improvement over the 25 percent report in the previous quarter.

However, with 10 percent of its systems tested and 3 percent implemented, it remains significantly behind schedule. Clearly progress is being made and clearly more needs to be done. In OMB's government-wide summary, the Department of Transportation is rated as a tier I agency. Unfortunately, tier I denotes a troubled agency with tier III being the best.

Nonetheless, I am pleased that we have such distinguished witnesses here with us, Mr. Chairman, and I look forward to hearing their testimony as well this morning. And this is a very important area and again I commend you, Mr. Chairman, for the work you've done.

[The prepared statement of Vice Chairman Dodd can be found in the appendix.]

Chairman BENNETT. Thank you very much, Vice Chairman Dodd. I appreciate your kind words and I must reciprocate that one of the nice things about this committee is that we have no partisan bickering or difficulties and complete cooperation across majority-minority lines. Indeed, those lines blur very quickly which is as it should be when you're facing a problem of this challenge.

I'm grateful to Vice Chairman Dodd for his contribution to that spirit and atmosphere of working together. Well, Senator, you have come in time to hear the Honorable Jane Garvey. Mr. Secretary, we thank you for your testimony. Stay close by. We may be back to you.

Mr. DOWNEY. Thank you.

Chairman BENNETT. Everybody wants to know about the planes falling out of the sky so we will go to Administrator Garvey and she will be the first member of an aviation panel. Sitting with her on the panel we will have Charles Feld, who is the chief information officer of Delta Airlines, to give us the perspective of a major international carrier. And then Ms. Deborah Freedman, who is the senior vice president of SABRE Technology Solutions. SABRE handles reservations for a number of airlines, and she will discuss airline reservations, scheduling and other support systems. And then the final panel witness will be Ms. Paige Miller who is commissioner of the Port of Seattle, who has oversight of the Seattle-Tacoma Airport. So we have the Federal agency, we have an airline, we have a reservation expert, and we have an airport. I think that combination should give us a pretty good understanding of where we can be New Year's Day if we want to be visiting somebody by air.

Ms. Garvey, Administrator Garvey, we appreciate your being here and we will start with you.

**STATEMENT HON. JANE F. GARVEY, ADMINISTRATOR,
FEDERAL AVIATION ADMINISTRATION**

Ms. GARVEY. Thank you very much, Mr. Chairman, Senator Dodd, and Senator Smith. Thank you very much. I appreciate the opportunity to appear before you this morning to discuss FAA's activities with respect to the Y2K problem. I have already submitted my formal written testimony and I would like to ask that it be made part of the record.

Chairman BENNETT. Without objection.

Ms. GARVEY. Thank you very much. I will offer just a few oral comments, if I can. Let me begin by assuring you, as the Deputy Secretary has, that the Y2K issue is a top priority for me. It is a top priority for the FAA. In February, we changed the management structure at the FAA, creating a Y2K program officer who reports directly to me. We have closed a significant gap in the OMB Federal Y2K Compliance Schedule, and we continue to make steady progress within the agency.

Our teams in the field have already assessed every system in the FAA, not just the mission critical systems. We are now, as you have indicated, well into our renovation phase where we actually make modifications to the systems that need them. By the time of the next OMB quarterly report, the FAA is scheduled to complete renovation of 99 percent of all of the required systems. As we continue our wider repair efforts, we are on schedule to have a majority of our systems compliant within the Department of Transportation and OMB's deadline of March 31, 1999. All of our systems will be fully compliant by the end of June 1999, a date that we have accelerated from our original estimate of November 1999, and we continue, at the Secretary and the Deputy Secretary's request, to evaluate our schedule and wherever possible, we will accelerate to meet the deadline of March 31, 1999, which OMB has established as the date that systems Government-wide will be Y2K compliant.

We have overcome many obstacles to get where we are today. I am proud of the work that the staff has done, and I am proud of the fact that we have been able to accomplish so much. However, I also recognize that we face many other challenges and we do have a long way to go.

One of the great challenges, as you have indicated, is working with our partners in industry to identify other areas within the aviation system that require a solution to the Y2K problem. Let me highlight some of the activities that we have undertaken at the FAA to address these industry-wide concerns. We have sponsored with ATA—ATA has been extraordinarily helpful—we have sponsored an Industry Day in June of this year and we have another one scheduled for late October. We have really had several goals in the Industry Day. One really is to assess the problem. Two is to offer some solutions, where we could, to the problem, and we also wanted to avoid duplication. We have a very short time table here, and we want to make sure that we are not duplicating each other's efforts.

We have been able to bring together key stakeholders from all sectors of the aviation industry to raise the awareness and really to work together on Y2K problems. We have had over 120 in at-

tendance in our June meeting, and I expect in October a meeting that will be even larger. And, I think it is fair to say that we felt that the information and the cooperation that was generated was beneficial for all of us.

We have also communicated with manufacturers of critical airport systems stressing the need for their products to be Y2K compliant and asking that pertinent information be sent to the affected airports and to the FAA. We have also developed and distributed a comprehensive airport system list to over 5,000 public airports to help them identify and correct Y2K issues. We put that up on the FAA Y2K website and I know that airports are accessing that on a daily basis.

On the international front, we have issued a Y2K International Project Plan in April, implementing coordination with our international partners. We are working very closely with ICAO to raise the awareness of Y2K issues in the international community, and we have assigned full-time an FAA employee to work with ICAO in their Montreal office to offer guidance and support in any way we can. We have identified the 6 countries where 60 percent of our Americans travel and we have a workplan in every one of those countries to deal with the Y2K problem. And, either the Secretary or I have met with our counterparts in those countries.

In September, 2 weeks from now in Montreal, I will offer, with the Deputy Secretary, two resolutions on Y2K. The first resolution will urge each ICAO member state to provide Y2K status in the form of a Notice to Airmen no later than July 1, 1999. The second resolution will require ICAO to develop and publish for use by its member states an assessment criteria for each state so we will know exactly what progress has been made.

Mr. Chairman and members of the committee, while I am pleased with the progress that the FAA has made in solving our Y2K problems, we recognize this is a unique situation. This is a deadline that will not slip. The solution will be found in cooperative and collaborative efforts between the FAA and the aviation industry. It is really essential for all of us to work together to make a smooth transition to the new millennium, and while I am pleased with the progress, I want to stress that I am not overconfident and will not be until January 2, 2000. Thank you.

[The prepared statement of Ms. Garvey can be found in the appendix.]

Chairman BENNETT. Thank you very much. Mr. Feld.

**STATEMENT OF CHARLES FELD, CHIEF INFORMATION
OFFICER, DELTA AIRLINES**

Mr. FELD. Thank you, Mr. Chairman and Vice Chairman Dodd, Senator Smith. It is really a pleasure and almost fun to be here today although the topic is not great fun. I think it is a very important topic as you pointed out. My name is Charlie Feld. I am the chief information officer at Delta Airlines, and prior to that, and I was particularly relating to Senator Bennett's remarks, I was the chief information office at Frito-Lay where we had 15,000 trucks and a perishable product, and then more recently until July of last year, I was the chief information officer that was involved in the merger of the Burlington Northern and Santa Fe Railroad, in

which case I went to retire, and before retiring Jerry Grinstein, who is the chairman of Burlington Northern, asked me to come over to Delta since he is on the Delta board. So I have now gotten in the airline business. So I have got a view of the problem in every direction.

We submitted our answers to the questions so hopefully I will just give a summary of that and then be available for questions. The way we have attacked it at Delta is really to take care of business at home first and then move to the broader network so within the Delta borders we have had tremendous focus from the top. Our CEO Leo Mullin, has led the charge. We have made it our No. 1 priority. We have more than half of our development resources on Y2K and the rest of the company is pretty much standing down with other systems request, and Leo helps me explain on a weekly basis the word "no" and what part of no do you not understand that you are not going to get this other request until we get Y2K done? So, Delta is getting strong leadership from the top.

In 25 years of being a CIO, I have probably been to board of directors meetings a dozen or so times. I have been to every board of directors meeting since I have joined Delta last fall, and it is a topic of review by every board member. So visibility for the top has really powered us into this thing and it is our No. 1 priority. And that is why we feel we will be successful.

We have got about 600 major systems in our airline, which is about twice what a railroad has, which I was kind of surprised at. It is pretty big information base, about 60 million lines of code. A couple of hundred of those are mission critical. Our plan, and we are on track to that plan, is to be fully remediated by the end of 1998 and fully tested by mid-year 1999 in terms of all of our systems.

In addition to fixing the Year 2000 problem, we have really made this part of us getting healthier as an IT organization and as an airline so we are beginning as part of it to replace a lot of infrastructure, a lot of old machines that are out there that needed to be replaced anyway. So we will have an asset going forward. This is not just a cost to us. And we have treated it that way and it will set the stage for us to go into the 21st century including recentralizing a lot of our technology acquisition processes.

On a broader scope, when you get outside of Delta's borders, we are focused on the major partners which obviously are the FAA, the airports, other airlines, reservation systems, the international front. So as we begin to expand the borders, we actually feel that that is getting healthier, but it is getting healthier at different rates. OK. I mean the question—meetings, as short as 3 or 4 months ago, I would have felt worse. I feel much better now. We have calibrated with the FAA from a lot of different sources and I would agree with Ms. Garvey that we are on track. They are doing the right things from the distance that we can see it.

The airports are kind of all over the map, as she indicated. Some of them are done. Some of them are just getting started. Some of them are trying to figure out how to get started. And as we increase our influence, we are going to keep pushing out to the airports through the ATA and IATA which are the two active partners that help us manage the airports. In terms of beyond the major

partners, there are so many interfaces and so many things that we just do not know just trying to figure out where things are going to come in from as we go more toward electronic commerce, and our strategy here is to continue to press out after the major partners but then be prepared and strong to react to things with business contingency plans and a very strong programming force as we go forward.

In terms of what Congress can do, there is a tremendous amount of overhead, filling out forms, answering questions, people playing not to lose, people being afraid to say anything, and I think the legislation would be important. Also, separating fact from fiction because there is enough fact in here that if we can just work on the facts that would be a lot better than dealing with a lot of the fiction. And more than anything else, although there is not a lot of time, there is still time, and I think what Congress needs to have is maybe not legislation but leadership.

The red light came on. I guess I am done.

Chairman BENNETT. You are allowed to finish your thought.

Mr. FELD. I think that leadership would be important, the same kind of leadership that our board of directors and our CEO has provided in terms of getting funds, getting focus, getting, you know, people to get on this, because this is just hard work. This is not nuclear science and the problem is just getting it up in the priorities, and I think these kind of meetings and this kind of pressure will really help a lot to CIO's and people that really want to get this done.

[The prepared statements of Mr. Feld can be found in the appendix.]

Chairman BENNETT. Thank you very much. Ms. Freedman, are we going to be able to get our tickets?

**STATEMENT OF DEBORAH A. FREEDMAN, SENIOR VICE
PRESIDENT, SABRE TECHNOLOGY SOLUTIONS**

Ms. FREEDMAN. Absolutely.

Chairman BENNETT. OK.

Vice Chairman DODD. That you will get. [Laughter.]

Ms. FREEDMAN. We have got a good story.

Vice Chairman DODD. Now, to get a plane—but you will get a ticket.

Ms. FREEDMAN. On behalf of the SABRE Group, a world leader in electronic travel distribution and information technology solutions, I appreciate the opportunity to address the issues facing the airline industry related to the Year 2000 technology problem. I am a senior vice president responsible for application development for the SABRE Technology Solutions Division of the SABRE Group. In that capacity I am responsible for coordinating the Year 2000 program for the SABRE Group and ensuring that our systems are Year 2000 ready for our customers who use SABRE Group information technology services and solutions, which include among others American Airlines, US Airways, and Canadian Airlines.

The SABRE Group was formerly an operating division of American Airlines and is now a separate corporation. Twenty percent of the company's stock is traded on the New York Stock Exchange and 80 percent is still owned by the AMR Corporation, American

Airlines parent. SABRE Group is a diversified information technology company that has two major divisions: the electronic travel distribution business and the information technology solutions and services business. Both components are interdependent as the electronic travel distribution business most commonly referred to as the computer reservation system, or CRS, is the largest distribution channel for airline schedules, prices, and reservations.

Travel agents and others electronically book \$66 billion of travel per year including about one-third of the air travel worldwide through the SABRE computer reservation system. Readying the SABRE CRS, the world's largest privately owned computer network for Year 2000 has been a large part of our company's effort. Consumers have come to depend on the one-stop shopping with their favorite travel agents and Internet sites, which in turn depend on a CRS offering, a seamless presentation of data collected from varying sources, airlines, hotels, car rental companies, rail, cruises, and tours.

Airlines depend on computer systems for most all aspects of their operations including flight planning, crew scheduling, maintenance and engineering, capacity planning, pricing, ticketing, and billing. The day-to-day operations of a major air carrier require hundreds of individual systems to work in concert so that the carrier may deliver quality service to its customers. The platforms for these systems vary from large mainframes handling millions of transactions involving flight operations, schedule changes, code share partners, reservations and financial reporting, to such simple personal computers handling staff planning for small airports with just a few gates.

Any observer of the airline industry will quickly notice its elaborate interdependencies, systems within the airline itself and between airlines and their partners, their passengers, and their cargo customers. For example, airlines regularly trade passengers with each other as they make their way from point to point on the globe, and the smooth transition of those passengers depends on the electronic transfer of data between carriers. Cargo operations exchange shipment data with forwarders, the Postal Service, and customers. Airlines require immediate availability of support services such as fueling, catering, and air traffic control, and the companies and government agencies providing these services are crucial to the reliable operation of the industry.

Individual companies in the airline industry cannot realistically operate in isolation from each other. Indeed, the overall success of the industry in solving the Year 2000 problem will largely be determined by how well industry participants ensure the reliable flow of information not only through their own systems but through each other's systems. Certain system failures could have dramatic and even cascading impacts on other members of the industry. The SABRE Group has made Year 2000 readiness a major corporate priority since 1995. The company's Year 2000 project has the goal of ensuring the hardware and software systems operated or licensed in our business including systems provided to our technology outsourcing customers, including airlines and travel agencies subscribers, are designed to operate and properly manage dates beyond 1999.

SABRE Group has developed a rigorous systematic approach to the Year 2000 problem which focuses on a detailed inventory of applications, hardware, system software, and utilities, analysis and remediation, testing of all systems and the continued Year 2000 readiness through repeated testing.

Early planning, high prioritization and clearly defined processes, careful correction, and thorough testing are keys to successfully managing the Year 2000 program. The SABRE Group's vast Year 2000 program involves checking more than 1,000 applications, over 200 million lines of application code, 3,300 third party products including operating systems and hardware, confirming proper system interfaces with more than 600 suppliers and providing new software and hardware in excess of 40,000 travel agencies. At peak, the SABRE group applied equivalent of more than 700 full-time employees to fixing the Year 2000 problem and to date has expended more than 1.2 million labor hours on the project.

We are pleased to report that the vast majority, over 94 percent, of all our systems, have, in fact, been tested and are deemed ready, and in the remaining days of our program, we are currently focusing on the continued deployment of hardware to airports and travel agencies, clean management which is the continued readiness of the systems and hardware, industry interface test to ensure interoperability by validating data feeds from the suppliers, partners, government, and other members of the industry, business simulation testing which is a day in the life of the airline and the CRS, and business continuity preparation should a failure occur such as building defensive code into our systems and working with our customers to define manual procedures where feasible.

As I have stated, the ultimate success of this effort in the airline industry depends in large measure on ensuring interoperability. The validation of industry components is already moving to the forefront of the testing initiative and will prove to be the final hurdle in the Year 2000 race. Efforts are currently underway to schedule Year 2000 testing with all the companies with which we and our customers trade information. At this point in time, we will be dependent upon many of our counterparts and partners and their completion schedules.

Over the next few months, the SABRE Group will use industry interface testing as a bellwether for readiness of the industry. In our context to date, I regret to report that less than 50 percent of the companies with which we have tried to schedule testing are prepared to schedule testing or execute testing. I hope this hearing will serve as a wake-up call for the airline industry. In conclusion, the SABRE Group is working diligently to ensure that the customers and the traveling public can depend on our systems in the Year 2000 and beyond. Thank you.

[The prepared statement of Ms. Freedman can be found in the appendix.]

Chairman BENNETT. Thank you. Appreciate that very much. Ms. Miller, we look forward to hearing you. I should point out again that in the survey the committee took only one of the airports we contacted responded. So you have a heavy burden here speaking for all of the airports, but we will only hold you for specifics for your own. So we look forward to hearing from you.

**STATEMENT OF PAIGE MILLER, COMMISSIONER, PORT OF
SEATTLE**

Ms. MILLER. Thank you, Mr. Chairman. I will do my best.

Chairman BENNETT. Thank you.

Ms. MILLER. Good morning. I am Port of Seattle commissioner Paige Miller. I am one of the five elected officials who are responsible for the operation of Seattle-Tacoma International Airport. And I am here on behalf of the citizens of King County in Washington State to explain how seriously we take the Y2K issue at Sea-Tac, as we call it, and to share with you some of our experience and to provide some suggestions on how Congress might help all airports deal with this crisis.

I am proud of the fact that a recent Air Transport Association review found that we appear to be ahead of many other airports in preparing for Y2K, but I am also here to express our concerns about how the airport industry will accomplish the Y2K program in the short time remaining.

The Port of Seattle is a leader in Y2K program mobilization. We started in 1993 replacing old computer programs to make sure that they will handle the Y2K transition and in 1997 we started looking at mechanical devices in our inventory for the embedded computer chip problems that could also fail. What we found was that practically everything in the airport was potentially affected and that we had better get moving fast to find the problems and get them fixed.

Examples of key systems that are high on our list: Security controls, runway lighting, baggage conveyers, fire alarms, backup generators, 911 response systems, storm water treatment, heating, and parking garage systems. If those systems fail, we obviously would have a difficult time maintaining even a minimal throughput of airplanes, passengers, and cars. Given the magnitude of the threat, we have mobilized a Y2K team. Today, there are 10 full-time staffers in that office, and there will soon be 30. That team is following the GAO recommended Y2K project plan available on the World Wide Web. That plan says find and assess each system, fix or replace it, test to ensure compliance, and make contingency plans in case it all falls apart anyway.

I have with me, by the way, our Y2K project plan, and I will make it available to your staff. As of today, we have identified 113 systems. We have completed initial assessment on all of them. We are just beginning to fix and test. At this point, roughly a third of our systems are not compliant according to vendors, a third are compliant according to vendors, and a third are still unknown because the vendor has not given us a definitive answer or is not in business anymore.

Our budget for fixing known non-compliant systems and testing all systems is approximately \$10 million. Fixing systems found to be non-compliant in our testing and testing them could potentially cost another \$10 to \$20 million. In the worst case scenario, this would represent nearly a third of our annual operating budget.

A number of factors make it difficult to solve the Y2K problem. First is the rock hard, unmovable deadline. January 1, 2000 will be here in 477 days. And every business, every airport, every government office from the Senate down to the dogcatcher must meet

that same deadline. That means we are all competing for the same technically competent people at the same time to fight the same deadline. Another important factor, as has been mentioned, is the liability concerns of vendors and owners which can delay their sharing of information and developing optimal solutions together. Finally, once you fix the system, you have the added effort to keep it fixed because when you fix something else, that may impact the system you have already fixed.

I am not here to assure you that we will complete our Y2K program on time despite our best efforts with our most capable people. We will do everything humanly possible to organize, manage, and deliver solutions for each of the 113 systems at Sea-Tac and to have contingency plans in place for their possible failure. In some cases, we are cannibalizing our own offices, pulling some of our best people away from other projects that badly need them, but the problem is worldwide and industry-wide involving airlines, airports, and air traffic control systems. What we know about other airports is that for the most part they have started their programs later than we have and they are planning to spend fewer resources than we are.

I will end with a few suggestions for ways Congress could help with the crisis. First, lead by example. The time for study is past. We urgently need to produce an emergency plan for the country which prioritizes sectors of the economy, identifies key resources that need to be redirected from the least important to the most important, and pass legislation to accomplish that. To do that, you may have to defer other urgent issues while you devote time to this one.

Also, consider some sort of emergency funding mechanisms to assist entities such as airports that serve the national interest to replace diverted operating and capital funds that they have depleted by Y2K. Some funds should also be used to make sure that all the compliance data that we and other airports create as we deal with this problem is immediately available to other airports that are trying to catch up on Y2K. That way they will not have to reinvent the wheel.

From 9-year-olds doing their homework on the net to the counting of ballots that put all of us in office, everyday technology is becoming more and more integrated in the daily lives of Americans. That is why the Y2K problem has the potential to create so much economic, political, and personal crisis. That is also why we need you to lead the country by aggressively organizing a national Y2K program and providing critical resources in funding. If you start now, you can do it and the Port of Seattle stands ready to help you.

[The prepared statement of Ms. Miller can be found in the appendix.]

Chairman BENNETT. Thank you very much. We appreciate your forthrightness and your candor. I have often said facetiously the way to solve the Y2K problem is very simple and that is to start in 1994. Your example in doing that is noted here.

Administrator Garvey, the flying public is probably most concerned about air traffic control. It is the issue that comes up first every time we talk about transportation and you have indicated a lot of progress from the last time we looked at this and that is very

comforting. One of the things we have been trying to do in these hearings is to allay public concern that might be overblown and I have to ask you why the GAO and Air Traffic Controllers Association are more skeptical about your ability to be prepared than you have indicated in your testimony here? Can you address those concerns directly?

And Secretary Downey, any time you want to step in to any of these issues, we would love to have you comment as well.

Ms. GARVEY. I see that the Deputy Secretary is letting me begin here. Thank you so much. [Laughter.]

Chairman BENNETT. He is just being gallant.

Ms. GARVEY. Well, first of all, let me address the issue of the GAO. That is something I do take very seriously. First of all, I think they are right to keep the pressure on us and we certainly know that that is part of the role that they have. As I looked at their most recent testimony, there were three issues that they raised that we have focused on. One is, for example, they say that they do not believe we will meet the OMB deadlines as they have been established, and they are quite right in that.

We have a deadline that is slightly different from the OMB deadline. For example, the full implementation and completion is March 31, and while we expect to have the majority of our systems completed by that point, for us, given the complexity of what we are dealing with, we believe June is a more realistic deadline. I will again reiterate, though, we are trying very, very hard at the Deputy Secretary and Secretary's request to pull that forward and to try as get as close to the March 31 deadline as we can. But we are trying to balance the reality and not overpromise, and we still believe that June is very, very doable.

The second issue that they raise, which I think is an important one, is do we have an accurate assessment of where our systems interface and have we really a plan in place to renovate those interfaces? For both of those questions, I would say yes, we are very much on target to have both the assessment and the renovations done by September 30, but again I think it is fair for them to point that out as an issue and we are very much focused on that and working on that.

There was an error, getting back to GAO. It just may have been a miscommunication on our part. I think they talk about 40 systems that they think we need to replace. It is actually a much smaller number than that and it is 40 components within the system. It is actually six systems that we focused on. So we are continuing to work with GAO. They will keep the pressure on and we will respond as we have, I think, in the past.

With our air traffic controllers, they have raised some issues about our contingency plan, about which we are meeting with them next week. We are just beginning the development. I think the key is to bring them into that process. That has been our plan to develop the contingency during the month of September. They will be meeting with us next week to begin to flesh out those contingency plans in earnest. So we will look forward to some good discussion with the air traffic controllers, and I have met with the senior leadership on this issue, and I think those meetings will be very helpful.

Chairman BENNETT. Mr. Feld, you are a user of all of the services represented at the table, not only the air traffic control system but reservation systems and, of course, airports. You have listened to this testimony, as we have. As a user of these systems, how comfortable are you that they will be available and ready to go?

Mr. FELD. I guess I will just go down the line and go left to right. I think, like I said earlier, the FAA, it is hard to sort the fact and the fiction a few months ago, but I think it is becoming clear. You know everything we can tell in terms of methodology, quality of people working on it, and how they are attacking it, you know, particularly the centralized systems which are the safety systems, are just basically everything that I would do and I feel comfortable as you can without being in the middle of it managing it.

I have also pulsed people. Over the years I have gotten to—25 years of being in the business—gotten to know people at IBM, who were pretty vocally critical, and they have turned positive now, and they said they think they have got it. So I mean fairly high up in IBM. So that. You know a couple of data points along with the methodology, the focus, the quality of the people working on it, from an external point of view feel very confident that the air traffic part will be there.

As you go down the line to reservation systems, much like SABRE, our reservation provider is WorldSpan. There are four major res providers: WorldSpan, Galileo, Amadeus, and SABRE. They have all been on it early. WorldSpan is Y2K compliant in the things that hit us, and we have been testing with them. They also have good connectivity to SABRE, Galileo, and Amadeus. So that part of the industry is about as healthy as anything I have seen.

As far as the airports go, you know, we have just begun to really look up and get involved through the ATA to really try and focus on the airports and really try and work with American, United, my counterparts there, for all of us to try and figure out a way to help out. Each one of us has a dominance in a different airport and, therefore, you know, I think this is the kind of thing if you can reach out and help with methodology, with capability, I think we are just going to have to get in that spirit of things to get the airports along. Some of them are fairly healthy and some of them are just starting to figure it out. So kind of from left to right, that is kind of how we are viewing it at this point.

Chairman BENNETT. Let me ask anyone. You heard from Mr. Feld about where his airline is. Do you have concerns about other carriers, regional carriers? I do not necessarily want names but categories. Is there one part of the airline industry where you think there is a weak link?

Ms. GARVEY. Again, I think you are right, Mr. Chairman, that in terms of some of the larger airlines, I think we are feeling very, very confident. Walt Coleman, is a really key member of the RAA, the Regional Airports Association, has been just terrific about coming forward to the Industry Day and working with us. One of the results of the last Industry Day was to create a working group for airports; and the regionals have been very involved in that with us. So again, I think, you know, we have work to do and probably, as Paige said, there is some variety of where they are, but I think we

are focused on it and certainly the leadership at RAA is very focused on it as well.

Chairman BENNETT. Yes.

Ms. MILLER. In discussing this with staff, because I am not a techie, one of the places that we have talked about maybe needing some special attention is not the big folks, not the airlines, but some of the vendors. We control a lot of systems at our airport, but there are some that we do not. For instance, the security access control system is going to be provided by a subcontractor to an airline. Those companies tend not to be that big and maybe are not that sophisticated, but if that system, for instance, were not to work, we would not be able to move people through our airport. So I think when we think about it, you think about some of the big players, you need to think about who might be a smaller player controlling a critical piece of the infrastructure.

Chairman BENNETT. Vice Chairman Dodd.

Vice Chairman DODD. Thank you, Mr. Chairman, and thank all of our witnesses. I would note, by the way, that Secretary Slater and Secretary Garvey were in, I think, yesterday in Nova Scotia, went up to be with the families on Swiss Air flight 111. We appreciate that immensely and commend you for your sensitivities of that tragedy where I think it was—was it 132 Americans who lost their lives?

Ms. GARVEY. That is correct.

Vice Chairman DODD. Several of my constituents, Mr. Chairman, from Connecticut. So we thank you for doing that. Let me pick up on the first question that the chairman raised, and he sometimes is more gentle than I am about these things. But just as a background, I mean I am looking down, I am trying to just collect data/numbers for people, I mean in a sense. There are 13 major U.S. airlines in this country. There are 34 national airlines. There are 52 regional airlines. There are 670 airports certified by the FAA and there are about a half a billion people who implaned last year in this country, just domestic traffic. I do not know if those numbers are quite right, but I think they are pretty accurate.

And when we get reports, and I again appreciate your comments, Ms. Garvey, and Secretary Downey, why do not you pull up a chair here too because I want you to get on this. [Laughter.]

Ms. GARVEY. Thank you so much, Senator.

Vice Chairman DODD. Sitting back there in spectator status here. But, you know, I read this memo—it is August 14—it is only a couple of weeks ago here now—and I get to the second page of this. This is the memo from the inspector general to the Deputy Secretary of the FAA, and they get down to the last point here, and I will just read it.

It says the report to the OMB shows that 63 critical systems and underlined—they underline it—will not be renovated and implemented by March 31, 1999, a date established by the OMB. Sixty two are in the FAA and one is in the Coast Guard. But the point is, I mean there you got this, you have got—we had testimony in Hartford—this is before this committee was established—the chairman knows about. I had Richard Swagger, who was the national technology coordinator for the traffic controllers, and he testified in February that while he thought the FAA would improve its

progress which at the time was dismal, he saw no way that the FAA could catch up and thus no way that we could sustain 100 percent of normal flight capacity on January 1, 2000.

I mentioned the GAO. We have heard from others here. Now, again, you know, I like rosy scenarios here, but it seems to me when you start looking at people who are looking at this thing, this is the notion somehow, the statement that by the next OMB report, quarterly report, FAA is scheduled to complete 99 percent of all required systems. I appreciate your words, but I am not terribly reassured when I hear from the inspector general and from other organizations that I do not think have any—I do not know of any particular purpose they would have in raising the specter here of some serious problems.

Mr. DOWNEY. Let me respond and then ask Jane to amplify that. We had the very same concern when we started to take a close look at what was going and the FAA was telling us that November 1999 was their target date for having all of their systems renovated, tested and implemented. We said that was totally and completely unacceptable and come back with a new plan. The plan they have come back with sets June 1999 as their target date and a commitment from Ms. Garvey and her staff that they will seek to even accelerate that to March. I would be a lot more comfortable if they were saying we have a plan to get everything done by March and we are looking system by system. In fact, we met yesterday on those 62 systems and said many of them are freestanding, they are not connected to air traffic, can we get those put in place so we can focus on any lagging systems?

But it has been a long push, but the progress is definitely there. On September 30, the renovation phase, which is renovation not yet tested, not yet implemented, will be completed for the majority of the FAA systems and that is a big step forward from where they were earlier, but I am sure we still have a long ways to go and we are making it No. 1 priority. When I meet monthly with each of our administrators, the very first question is where are you on this and each time I have met, we have seen more progress, and each time I say that is good, how much more can we do?

Vice Chairman DODD. Well, I would hope this committee will be kept informed almost on a weekly basis, we ought to be kept informed, because this is—you know, when I get the General Accounting Office saying in August it is doubtful the FAA can adequately do all this in the time remaining, accordingly they ought to ensure continuity of critical operations and so forth, I think we want to monitor this on a very, very close basis as to how you are proceeding.

And second, I remind you you have got to be tough now when you talk to these people because finding the truth out at the top of the pyramid here is difficult because everybody wants to pass along good news. And the chairman has said this before and it is tremendously accurate. The hardest job for a person in that position is to find out what the truth is, and you are the ones we talk to in these committee hearings. So we are expecting from you all to be rigorous, rigorous in your questioning and in determining whether or not this information is being, not just progress is being reported, but whether or not it is being achieved. I could care less

about whether or not it is being reported. I expect it to be reported. I want to know whether you are getting the job done.

Ms. GARVEY. Senator, if I could just add one thing. I meet with Mr. Mead every other week, who is our inspector general, and his staff. They are part of our team. They are an integral part of the team. The 63 that he refers to in the memo, we absolutely agree with. We have said they will be done by June. What it will not be is the March 31, and that is the piece that, as the Deputy Secretary said, we are still trying to move that forward. But we will be done by June, and he is in agreement with us on that as a schedule.

I also want to mention that his staff validates our progress. In other words, every time we get a progress report, if I say 60 percent is renovated, we have an independent outside contractor validating that and the inspector general validates that as well. So we have really two data points, if you will, for validation. The meetings with the inspector general have been extraordinary from my perspective. We talk definitely weekly and sometimes almost daily on this very topic and his senior staff people are part of the team that are working on this.

I frankly do not think I can do it alone. And I rely on people like that, as you do as well, to say: "Time out, we have got a problem here." So we are in agreement on that schedule. We are in agreement on that number of 63. We will get it done by June, and we will try our darnedest to get it done by March 31.

Vice Chairman DODD. Let me ask you quickly because I do not want to take up time here. I talked about domestic operations here. I want you to take me offshore a bit because we have an awful lot of people—Delta is certainly an airline that a substantial part of its business is offshore. I want you, Mr. Downey, to give us a very cold assessment right now, and I have asked the question before on domestic flights as to whether or not you would fly on January 1, 2000. If I were to ask you whether or not you would get on an international flight on the date January 1, 2000, what is your answer to that question?

Mr. DOWNEY. It would depend where it was going.

Vice Chairman DODD. Well, how about giving us some idea? If it is going offshore, you have serious questions; is that what you are telling us?

Mr. DOWNEY. As Ms. Garvey said, we are working very closely with the air traffic authorities in the six countries that accommodate half of all of our passengers. We are feeling pretty good about those. But there are parts of the world where air traffic control is rudimentary and where attention to this issue is so far almost nonexistent. That is one of our reasons for going to the ICAO meeting later this month and asking for an international resolution to require reporting so that we can then take appropriate action. If the appropriate action is an advisory, which in some cases it would be, we would do that. If the appropriate action were to be to ban American flights to a particular part of the world, we would also do that if we feel it is necessary.

Vice Chairman DODD. Are you working with the State Department on this and other agencies?

Mr. DOWNEY. Working through State on this and working with the embassies around the world, and ICAO is a U.N. organization to which we have an ambassador who is part of the State Department and a delegation that will come from transportation including the airlines and the unions to underscore the importance of the issue.

Vice Chairman DODD. Time has expired, Mr. Chairman.

Chairman BENNETT. Thank you. Senator Smith.

Senator SMITH. I would like to pick up where Vice Chairman Dodd just left off, and I have always thought that government standards were very critical but actually rather minimal standards. And I want to ask Mr. Feld if you have a business standard that you are going to employ to pull the plug, if you will, on flights overseas? Do you have a standard different than the Government's, higher than the Government's?

Mr. FELD. I think what I have seen in the airline business—I have only been in the airline business since last fall—is a tremendous conservatism in terms of safety. I mean I was in the railroad business, and I mean we kill a lot of people in the railroad business just sitting on tracks and, you know, you cannot stop a train at that rate, and I thought the railroad business had a pretty safety minded kind of idea about it. You come to an airline and it is like the air you breathe. I mean pilots will not push back if they are not 100 percent confident in completing their flight as planned. I mean there are so many gates along the way where somebody can just pull the plug and say I am not flying.

And, you know, even though on-time is critical and cash flow is critical, I have never seen a culture where safety is so critical that pushing back a flight is not anything that anybody gets pressure to go do. We are beefing up our business continuity plan. I mean we are less worried about air safety at this point than we are about things like cash flow, service, finding bags, things like that, because I mean we believe that going up is unacceptable if it is just not for whatever reason. This just happens to be a very big event.

Senator SMITH. I am glad that safety is the first criterion and will be the standard by which you will measure whether or not you are going to let flights go, but then you get to the point Ms. Miller made, and that is all the back-up systems, all the vendors; what if the security systems are not fixed in Bangladesh, are you going there? Or do you go there now?

Mr. FELD. No.

Senator SMITH. I mean what will you do if it is apparent that an airport is just not going to be able to get bags from your plane to where the passengers are going to get them? Are you going to pull the plug on those flights? Are you alerting these airports that that is the case?

Mr. FELD. Yes. I think that, you know, the whole system has to work. We have had a lot of discussion about success in the whole airline industry; if it is not we are done. And we are really starting to look up and starting to actively offer help to anybody that needs help, both methodology and people, because the system will not work. The other thing about the airline business is a problem in any city will cause problems to back up anyplace and it is pretty immediate. So there will be gridlock. I mean nobody will go any-

where; right. So I just think the system is a self-correcting system in terms of just not going if you cannot get there, there is no place to put planes, there is no place to park, there is no place to go. You see it in a thunderstorm. Everybody sits down and waits until the time comes. So, you know, again, I mean our major concern is air safety first and then the things that follow from there, and, you know, we are a lot more optimistic.

I will just say in response to the inspector general, and, you know, I have my own burden to bear with auditors that have predicted our death over and over again every month, and they serve a purpose, but that is their job, right, to go find it. I would like to get the amount of work—I mean we spend probably 40 percent overhead on fixing this problem, dealing with people externally, internally, auditors, everybody else, trying to prove, document, that we fixed it, who fixed it, in case something goes wrong. I mean if we spent 100 percent of our time fixing the problem, we would go a long way toward it, recognizing that audit has a role and everything else in terms of pointing to where the big problems might be. But I am actually a lot more optimistic. We have pulsed every chairman of every major technology company that has come through, both Leo Mullin and I, and, you know, it ranges from total meltdown on the part of, you know, some things you read in the press to it is kind of a bogus thing, there is nothing going to go on here. And I think most people feel that no technology, whether Lou Platt, chairman of HP, or anyplace that, you know, there is going to be some discontinuity but not a meltdown if we stay on it. And that is the issue. We have got to stay on it. We have got to use every bit of the next 16 months helping each other out and figuring out ways to get it done, not ways we are not going to get it done.

Senator SMITH. Ms. Garvey, there are lots of Y2K rumors around right now, and one I picked up on the Internet with respect to the FAA is that the FAA plans to ground all flights in the United States at 6 p.m. on December 31, 1999, and will not let any take off until January 1, 2000 at 6 a.m. I wonder if you want to dispel that rumor today?

Ms. GARVEY. Well, that will be news to me since I'm planning to travel to California that day.

Senator SMITH. OK.

Ms. GARVEY. So that is simply a rumor.

Senator SMITH. OK. Thank you. Ms. Miller, as a northwesterner, I salute you. I thank you for what you are doing to prepare at Sea-Tac for Y2K. I wonder if you can speak to the back-up and feeder airports in the Northwest? Are they as prepared as you? Is the flight from Pasco to Sea-Tac, one that I take fairly frequently, going to be drastically impacted?

Ms. MILLER. I would have to say based on what we know, most other airports, even large ones, are behind us, and certainly the smaller ones tend to be behind the larger ones. The one note of consolation is their systems tend to be a bit simpler and they can be bypassed in a more effective way. You can walk from the tarmac around the airport building if you have to in a lot of the smaller airports in a way that you would have a difficult time doing at a

larger one. So they are behind, but then again maybe they have better ways to work around it.

Senator SMITH. How is Portland doing?

Ms. MILLER. I can get our technical person to answer that if you want.

Senator SMITH. That is OK. I go there more often than Sea-Tac—but I assume also a difficulty these feeder and backup airports have is the vendor problem you described. Their problem would be even greater, I assume?

Ms. MILLER. The other issue we have is our systems are integrated with others. Will the utilities work? Will the traffic lights in our surrounding city work? Will all those systems that we rely on work? And the other thing is in planning for contingencies, do we have each contingency plan on something else? For instance, apparently our first cut at contingency if our ground phone lines do not work, we will use cell phones, and the cell phone contingency was if the cell phones do not work, we will use ground phone lines. You know obviously that is not a good contingency plan.

Senator SMITH. Thank you. Thank you, Mr. Chairman.

Chairman BENNETT. Thank you. I am not going to ask you to name the six countries. I think I can guess where most of them are located in the world. Can any of you give us an indication of what would happen to the domestic system if a substantial number of international flights were canceled? What kind of a rolling back-up problem would be created at JFK, for example, most of whose traffic is international? At Dulles? All of a sudden flights do not start to go, what is the immediate impact? You mentioned a thunderstorm in one part of the world then ripples through the whole system. What is going to happen if we can, in fact, only send flights to six countries and what will be the impact over time on the American system if that happens?

Mr. DOWNEY. I think Mr. Feld's comment on that earlier was right on target. This system works like a Swiss watch when it is working well, but all the parts have to be working, and it will ripple through. If you would like to come visit sometime out in Herndon at the FAA's flow control center, you can see that on the big screens. You can see in any given day how all of the airports are interrelating, how all the flights are interrelating. How something as simple as a thunderstorm can cause massive changes to the system all across the country and something like this would be very difficult to recover from.

Mr. FELD. Yes. I think, you know, depending on how quickly we could get on it. That is why I say I think getting the core systems working, getting the big pieces working so we can have all of our programming and process capability and business contingency focused on the seams that are not working. If it was a matter of days, right, there would just be, you know, discontinuity, and it would be like, you know, just a series of bad days with thunderstorms. If it went longer, I think we would have to step back. And again I am making this up because I have been in the airline business, right, a fairly short period of time, but I think we would just have to readjust our schedules. We have in our large case, you know, a large part of our franchise is domestic, and we would, I

assume, just have to readjust until the longer term issues were settled.

Chairman BENNETT. Well, you have gone the direction that I have been thinking, which is that you should not wake up on January 1 and say oh, my gosh, here are the countries we cannot fly to, what do we do? Senator Smith has raised the issue do you have a schedule already laid out? I would think you ought to be addressing the schedule issue. If we cannot fly to these countries, we ought to know that and start scheduling for it in September or October/November 1999 so you do not get the sudden hit of oh, my gosh, all these flights are now canceled for safety reasons or airports that cannot handle them wherever, and the ripple effect through the entire system then becomes crippling. I know this is a very sensitive issue. It is going to raise bilateral problems in the bilateral air agreements that we have signed as a nation if another nation says what do you mean you are not going to allow an American carrier to fly to us and you are violating your treaty obligations and so on and so on. But is anybody in the Department of Transportation thinking about this and talking about the impact on bilateral relationships?

Ms. GARVEY. Just a couple of points. First of all, I think that is why the assessment, Mr. Chairman, is so important and the work we are doing with ICAO right now and over the next several months and the Montreal meeting is really critical for us. A good part of the discussion will be on Y2K. Getting that assessment so we can make some judgment about schedules will be, I think, really very important and we will be involving ATA in those discussions as well. In terms of the bilaterals, it is probably more within the International Office of the Secretary and Charlie Hunnicutt's shop.

Mr. DOWNEY. And this is why the Secretary raised it at the European Ministers Conference to sort of lay the marker down that we have to make progress. This is just one area of many where we need continuity plans. Our contingency plan has to be broader than just one system is not in place, another one will suffice, but really how do we assign priorities to the continuity of commerce and the continuity of travel that will require working with the various carriers whether it is airlines or railroads or trucking companies, but that is the approach we are taking.

What is the function more broadly for the economy that is being served and how do we make sure that it works well? If it means we had to make some tough decisions about making 90 percent of the system work well by sacrificing service to some places that are questionable, that is the kind of thing that we would have to do, and I agree with you we would have to do it early to do it well. So that is again one of the reasons why we have been pushing for the earliest possible assessment of the system so that we can then move forward with the contingency plans knowing the system is working, here are the contingencies that we have to worry about, and we want our mind focused primarily on that during the mid-months of 1999.

Chairman BENNETT. OK. I just have one more question and it relates to your answer, sir. The FAA had planned to issue both a business continuity and contingency plan with an end-to-end test

plan by 31 August 1998. We have not seen that. Do you want to tell us where you are on that and when we can expect that?

Ms. GARVEY. Mr. Chairman, we have expanded it to be more encompassing than we had first planned including some of the industry elements and so the business plan will be ready by December, in large part again because we have broadened it. We also want to include in it the contingency plans that we are working on with and will work on with the unions so it will be by the end of the December that we will have that plan ready to go.

Chairman BENNETT. Senator Dodd.

Vice Chairman DODD. Yes, thank you, Mr. Chairman. That was a question I had as well. So it is not ready yet. The August 31 date you did not meet?

Ms. GARVEY. That is correct because we changed the scope.

Vice Chairman DODD. OK. I was very impressed and have been, Ms. Miller, with the Port Authority in Seattle. It is a wonderful facility. The few times I have been there I have been very impressed with how well things run, the intercoordinated efforts in the city, and as someone who comes from the other part of the country I have always been deeply impressed with the quality of people who have been involved in the city of Seattle's management of their transportation systems.

A concern I have—we have raised this with others—is the cooperation we are getting from the private sector on this. I gather, Mr. Chairman, that the Judiciary Committee is about to mark up a liability bill in the next few days.

Chairman BENNETT. The Judiciary Committee is scheduling a mark-up of the bill, and it will be the Hatch, Leahy, Kyl, Bennett, and Dodd bill, if you are willing to leave your name on it.

Vice Chairman DODD. Sounds like a bad law firm. [Laughter.]

Well, we will take a look at it. I want to see what is in this. We have introduced it, you and I, as—what do they say—it is—

Chairman BENNETT. By request.

Vice Chairman DODD [continuing]. By request of the administration. But I am concerned because the chairman has indicated that we have had actually a very low level of cooperation, I would identify it as, from the private sector in terms of letting us know and letting respective agencies know about where they are. We have reported out of the some 2,000 companies that produce medical devices, we have had about now 500 that have responded to correspondence. I mean we are not even—it is not a question of whether or not they are complying with it. I do not know if they are even letting you know where they are. I do not know what this bill is going to look like, but my patience level with providing a liability cover for someone that will not even write back a Federal agency to let you know where you are is very low.

I do not know where others are on it, but I certainly understand the implications on this, but when you get such a tiny minuscule level of cooperation on something so important as this, I find it terribly disheartening and I am concerned about the level, the numbers, Mr. Chairman. You indicated only one really—we have heard from one major facility.

Chairman BENNETT. At the opening of the hearing, we pointed out we contacted 32 entities in transportation generally. That in-

cludes the next panel as well as this one. Sixteen responded. And out of that group of 32 that only 16 responded, there was only 1 airport that responded.

Vice Chairman DODD. Well, what has been your experience in this, Ms. Miller? What sort of cooperation are you getting from suppliers, vendors, and then I am going to come to you, Mr. Feld? Again, you are here representing one airline, and I am not going to ask you to draw you into a competitive discussion, but it has been noted here that Delta has been very, very forthcoming, and I will utilize this opportunity here to commend Delta for its aggressive, proactive efforts, and I would hope that others would act accordingly. But give us some indication of what sort of cooperation you are getting as you are trying to get this?

Ms. MILLER. As I mentioned, of the 113 systems, a third of them are ones where either the vendor has not responded to our inquiry or they have gone out of business. So there is a large problem there with just getting the information that the vendor has about whether a system is compliant or not and in what circumstances, and what that means if you do not get it from the vendor, you are going to have to start from scratch in testing it. It would be tremendously useful if we could up that cooperation, and I do believe that a large part of why they do not respond is concern about the hoards of lawyers who might be out there ready to file class action suits on anything they might do.

It is a ticklish public policy question for you. I mean I am a lawyer, went to law school in your great State as a matter of fact.

Vice Chairman DODD. No wonder you are so successful out there. [Laughter.]

Ms. MILLER. And for me, I sit here and go how could it be that products were still being sold last year that had this problem? How could it be that the most farsighted people, the technology people, still were selling noncompliant products, and should you folks be in the business of somehow limiting liability for people who were in my mind irresponsible? On the other hand, if you do not find a way to give some assurances and limit liability for those who are acting in good faith and trying to help, who fear that they will increase their own exposure if they cooperate, then those of us who are scrambling to fix the problems that we have got will not get their help. And it seems to me that that is the crux of what you need to deal with in whatever legislation you pass.

Vice Chairman DODD. Have you publicized the names, for instance, of companies that have not responded in a public way, so as to avoid the obvious defense that we never got the letter, we did not hear about this? We have been talking about doing something in a similar vein with other companies from various agencies; we have suggested that we are going to utilize the bully pulpit, if you will, of this committee and the Congress to publicize the names. First, it might just embarrass people to start to get on the stick, but second it is going to limit your defense somehow that you were not aware that this was going on. Have you done anything like that?

Ms. MILLER. It is risky. Once you do that, the chances of getting their cooperation are going to go down farther.

Vice Chairman DODD. You think so.

Chairman BENNETT. We have found the contrary, that a lot of folks did not want to be on that list when Senator Dodd and I stand up on the floor. They have been coming forward.

Ms. MILLER. I wish I had your clout.

Vice Chairman DODD. It is vastly overrated. [Laughter.]

Mr. FELD. The Delta board asked two questions when we went through the original presentation as to what this is going to take. One, can we get it done? And we said, yeah, but there is a lot of other stuff that is not going to get done. OK. The second question was what have we learned from this? How did this happen; right? And I think that that is a lot to take out of this in terms of I mean I believe as a chief information officer that technology has run amok and what has happened is people are beginning to understand how dependent we are on technology, and Y2K is a wake-up call to most boards. And second, how interdependent we are and ever increasingly interdependent, and with no standards—right—no inherent I mean policy in companies where every department buys what they want; there is no standardization. I mean this problem if well constructed should have the date in one place and every program in that company ought to point to that date and fixing this should have been an afternoon's worth of work—right—instead of dates all over the place on everything. As you said before, it is still going on. People are just, you know, we are not learning anything from this.

Vice Chairman DODD. We had witnesses before the committee a few weeks ago, literally we saw the hospital, the local hospital here in Washington, where they are getting medical equipment.

Mr. FELD. Right.

Vice Chairman DODD. Sophisticated costly medical equipment, dialysis machinery at \$14,000 a copy, that was produced 2 years that is noncompliant.

Mr. FELD. Yes.

Vice Chairman DODD. I mean, you know, they have to replace all of this stuff.

Mr. FELD. I think, you know, in net, we got to figure out two things, a way to get out of this in a way where people work together, and one of the things that I take away from this because really I have not looked up that much because I have been so focused on what we are doing, is I have access to just about every chief information officer that surrounds me, and I do not need Congress and I do not need anybody to call them and say let us sit down and talk about this, right, the head of American Airlines, the head of United. I mean we are all friends. We know each other. We can do a lot.

Vice Chairman DODD. Has there been any effort like that to bring together the major airlines?

Mr. FELD. Yes, I mean it is starting. I mean it was not here 6 months ago. It is now. The second thing is to somehow get some sort of public policy around standardization and some certification rules around what is happening, as we go into the 21st century. Let us assume we get it fixed.

Vice Chairman DODD. Yes.

Mr. FELD. Let us not let it keep happening.

Vice Chairman DODD. I know we have to get to the next panel, but I wanted to ask Mr. Downey and you, Ms. Garvey, I went down the list of the 13 major airlines, national airlines, regional airlines and airports, and major international carriers, have letters and correspondence gone out to all of them requiring or inquiring as to where they are in all of this? And I would like to know to what extent you have heard back from these entities and what sort of information you are getting back and whether or not we are hearing back from people not responding and whether or not you are getting the proper communication because I tell you this is another area where, again, I think, for airports and airlines that are not responding to requests for information, I would like to know who they are?

Mr. DOWNEY. The first step on that, Senator, was to reach out to each of those entities through the usual channels. The chief inspector who works with them warned them that we wanted this information. It was followed up with letters. And September 30 is the first response date, and we expect to hear back from the airlines and the airports a general response by September 30 and a specific response by the end of the year on the status of their plans. So we will have two benchmarks, and we certainly will follow up. Anyone we do not hear from is going on a watch list as suspect for operations.

Ms. GARVEY. One additional piece is we do have the added ability through our inspectors, as the Deputy suggested, particularly with manufacturers to build that into the inspection checklist so that that is a good piece of it. I would also just mention that with the new equipment we are getting, we are finding some of the same issues, which is even the new equipment is not Y2K compliant. So, we have built that into our contracts and have since March and are discovering, though, that we cannot simply take the word of the contractor, but we need to do an independent validation and before it is deployed, before we have implemented the contract and paid for the contract, we tested it in our technical center in New Jersey. So, it is important to do that.

Chairman BENNETT. Yes.

Vice Chairman DODD. Thanks.

Chairman BENNETT. Very good. We thank you all.

Vice Chairman DODD. Ms. Freedman, you gave such excellent testimony, I do not have any questions for you.

Mr. FELD. We are virtually done.

Chairman BENNETT. Secretary Downey, you probably ought to just stay where you are. [Laughter.]

The next panel will deal with the other modes of transportation besides aviation, and the first witness will be Ms. Joyce Wrenn, who is vice president of Informational Technology and CIO of Union Pacific Railroad. Next will be Mr. Scott Skillman, who is vice president and CIO of Crowley Maritime Corp. Crowley is one of the nation's largest and most highly automated marine freight shipping companies. Then we will have Mr. Chris Lofgren who is chief technology officer of Schneider National, which is one of the United States top five trucking companies. And the last witness, Ms. Robin Stevens, who is chief of the Year 2000 Compliance for the New York Metropolitan Transportation Authority.

So where we have had a major emphasis on aviation the first time, we are now going to have railroads, trucks, maritimes, and mass transit.

Vice Chairman DODD. Only one, Pony Express, is not here. We did not get them.

Chairman BENNETT. Well, the Pony Express——

Mr. LOFGREN. That would be us.

Chairman BENNETT. We have just dedicated the Pony Express Memorial statue in Salt Lake City, Utah, and it seemed relatively low tech. [Laughter.]

Vice Chairman DODD. It is that horse Y2K compliant?

Chairman BENNETT. Yes. All right. We will go in that order. Ms. Wrenn, we will start with you.

STATEMENT OF JOYCE WRENN, VICE PRESIDENT OF INFORMATION TECHNOLOGY AND CHIEF INFORMATION OFFICER, UNION PACIFIC

Ms. WRENN. All right. Good morning, Chairman Bennett and Vice Chairman Dodd.

Chairman BENNETT. We appreciate your patience while we have gone through the other. Your problems are not less important, but maybe for the press they are little less sensational.

Ms. WRENN. It was a very interesting discussion to hear. My name is Joyce Wrenn. I am vice president of Information Technologies for Union Pacific Railroad. I want to thank you for the opportunity to speak to you today about one of the most critical issues facing businesses today and that is the Year 2000 compliance.

Union Pacific is the largest railroad in the country, operating 36,000 miles of track in 23 States. More than 50,000 employees on our railroad use computer technology every day and in almost every facet of their job to make sure that the goods entrusted to us are transported safely and according to plan.

Year 2000 has implications in all areas of our business and for our business partners. Our senior management places the highest priority on ensuring that Union Pacific Railroad is Y2K compliant prior to the next century. We are committed to making January 1, 2000 just another day.

I have submitted a written statement outlining specific measures Union Pacific has taken to achieve this goal. The Association of American Railroads has provided an attachment to my statement that outlines the industry status on Year 2000 issues. In my comments today, I would like to highlight Union Pacific's technological preparations for the turn of the century.

Beginning in 1994, Union Pacific's management recognized the importance of Year 2000 issues and began allocating resources accordingly. Union Pacific Railroad expects to spend just under \$50 million by the time this project is completed. By 1996, Y2K compliance efforts were in full swing and have been a No. 1 priority ever since. Currently we have over 100 employees working full time on Year 2000 issues relating to software, hardware, and embedded chips. This encompasses a vast amount of information. The issue of embedded chips alone includes locomotives, automated train switching systems, computer-aided train dispatching systems, sig-

naling systems, computerized fueling stations, weigh-in-motion scales, cranes, lifts, PBX systems, and computerized monitoring systems throughout the company.

Despite the seemingly overwhelming task, I am pleased to report that Union Pacific's Y2K project is on plan and many of the sub-projects will be implemented, fully tested and certified Year 2000 compliant by the end of 1998. The Office of Management and Budget has recommended a five-step Y2K compliance program including awareness, assessment, remediation, validation, and implementation. Under these guidelines, UP has completed steps one and two. Step three, remediation planning, is also complete in most areas. The last two steps, validation and implementation, are well underway and many areas are scheduled to be completed this year.

We monitor our progress on these tasks through formal project review meetings held several times each month and quarterly updates to senior management and the board of directors.

Our progress toward Y2K compliance has been noted by more objective parties as well. On July 21, 1998, Electronic Data Systems conducted an independent audit of UP's Y2K readiness. They noted that—in quotes—"an exceptional Y2K readiness project is in place. Union Pacific can and should be proud."

Let me address a few critical issues in greater detail.

One of the most pressing issues for the transportation industry is guaranteeing public safety. We are confident that the railroad will be just as safe on January 1, 2000 as it is today. There has been considerable concern expressed to the railroad industry about signals and highway grade crossing devices. Industry research and testing indicate that signals and grade crossing devices do not employ date calculations and do not depend on dates. Because of this, they are not subject to the sort of Year 2000 problems that are of the greatest concern to this committee.

Nonetheless, the industry will continue to research and test until we are assured that every safety critical component and system will operate properly before, during and after the century change. At Union Pacific specifically, we are testing selected critical software, hardware and embedded systems even if they have been certified compliant by the vendor.

In addition, in cooperation with AAR, Union Pacific is sharing information on the compliance and testing of safety critical components common to the industry. UP has committed to help fund the development of a shared web site for this purpose and access to this information should be available in the third quarter of 1998.

Union Pacific is also concerned with maintaining smooth business operations for ourselves and our customers. By July of this year, we had asked 335 essential suppliers to inform us of the Y2K status of their internal systems. Over 90 percent have responded to our surveys indicating they have a solid Y2K project plan. Our Y2K project also covers electronic exchanges of information with customers, vendors, other railroads, and banks. UP is taking a very active role with the AAR in testing a new four-digit year standard for the railroad industry and trading partners and testing is expected to be largely completed by the end of this year.

UP is also maintaining support for older versions of electronic transactions that interpret a two-digit year for customers an ven-

dors who continue to use the two-digit system. Despite these measures, we recognize that total coverage of all internal and external Year 2000 problems is unlikely. Therefore, we are developing a Y2K contingency plan in 1998 and adjusted as needed in 1999. Currently, we plan to have a Y2K command center staffed 24 hours a day for technical experts beginning in the fourth quarter of 1999 and continuing into early 2000 for any problems that might occur due to Y2K.

Although we have planned for January 1, 2000 to be just like any other day, contingency plans will be ready to implement just in case. We believe we have adopted a responsible course of action that will allow us to continue to serve our customers and protect our employees and the public well into the next century. Again, thank you for the opportunity to discuss Union Pacific's Year 2000 plans. I would be happy to answer any questions.

[The prepared statement of Ms. Wrenn can be found in the appendix.]

Chairman BENNETT. Thank you very much. Mr. Skillman.

STATEMENT OF SCOTT SKILLMAN, VICE PRESIDENT AND CHIEF INFORMATION OFFICER, CROWLEY MARITIME CORP.

Mr. SKILLMAN. Good morning. I am Scott Skillman, senior vice president and chief information officer of Crowley Maritime Corp. I am pleased to have the opportunity to address the committee regarding the Year 2000 issue, its effects on our company and the maritime industry.

Crowley is a privately held company engaged in——

Chairman BENNETT. Could you move the microphone just a little closer to you?

Mr. SKILLMAN. Sure.

Chairman BENNETT. Thank you.

Mr. SKILLMAN. Crowley is a privately held company engaged in maritime transportation and related services. The company has primarily two operating subsidiaries, Crowley American Transport and Crowley Marine Services. Crowley American Transport provides containerized liner cargo services between North America, South America, Central America, and the Caribbean. It has 121 locations serving 40 countries with 50 ships and barges. Crowley Marine Services provides worldwide contract and specialized marine transportation services. It operates a diverse fleet of 200 tugs and barges and specialized equipment including oil tankers, tank farms, heavy lift cranes and large all-terrain vehicles.

In general, the international maritime industry has some unique issues it deals with which could be impacted by the Year 2000. The documentation of imports and exports of cargo and associated governmental regulations for Customs duties, international negotiable bills of lading and documentation of shipping manifests, EDI with customers and vendors. We see Year 2000 concerns for the industry in that the governmental organizations required to clear cargo and vessels in and out of ports including customs, immigration, naval or Coast Guard services and taxing authorities may not be able to perform their normal processes which causes bottlenecks, delays, port congestion, and reduced commerce.

Another industry issue is the electronic tracking of fleets of containers, chassis and trailers and consequently our cargo from customers. Electric power and telecommunications problems could severely reduce the ability to provide these functions. Crowley, and we assume other shipping lines, have the usual Year 2000 issues with computer applications, computer equipment, voice and data communications, and satellite communications. The operating equipment on our vessels contain Year 2000 issues with embedded chips. There are issues with navigational systems, GPS, communication systems, engineering monitoring systems and components in the steering.

In the case of chartered ships from third parties we are obtaining Year 2000 warranties in the agreements, but presently there is no certification process to verify these ships in the worldwide fleet are Year 2000 compliant. As it relates to operating equipment on terminal facilities, there are cranes, scales, refrigeration equipment, forklifts, and other automated yard equipment. And finally, we are investigating the impact from critical business partners we have in the United States and internationally.

As far as Crowley is concerned, we have established a worldwide Year 2000 company project. The project is headed by an executive steering committee composed of the chairman and CEO and other senior officers of the corporation. It reports quarterly to the board of directors. The core project team is composed of more than 100 senior personnel selected for their expertise and knowledge in the particular areas including land, marine, and international operations, purchasing, administration, finance, legal, and the information technology department.

We have already remediated all of our mainframe applications and we are presently in the testing process. We are replacing some of the old systems and that will be done by March. It is important to note that the success of our program to date is the result of the company's realization that it is really a business continuation issue and not an information technology department issue. Business contingency plans are being focused on for unexpected problems that impact our operations including those due to noncompliance or difficulties with our partners. We expect this contingency planning process to be especially burdensome.

The general preparedness of the maritime shipping industry is sketchy right now. At this time, we are not aware of any maritime industry organization that has provided an overall forum to discuss the preparedness of the industry. However, the U.S. Coast Guard and insurance clubs have sponsored maritime industry Year 2000 conferences and third party maritime interaction within the United States shows a confidence in their abilities to be prepared.

As it relates to our offshore locations preparedness in Latin America and the Caribbean, I can offer you the following. Large companies, mostly multinationals, are addressing the problem. Small companies appear to be approaching the problem as a technology issue. The foreign public sector is a concern. Being very large and decentralized institutions, there are several departments handling pieces of the function separately. Efforts appear to have started very late. Many have limited resources and are limited by the budget of the governments.

Customs in most countries are still a question. Problems will force the use of alternative manual procedures which will cause delays. The review of power and communication companies have not yielded any conclusive responses as to whether they will be able to operate. At the present time, many government controlled organizations are in the process of privatization. This could either help or hinder the situation. Again, I would like to emphasize that we are operating in Latin America and the Caribbean. Trade routes to Europe, the Middle East, and Asia are another complement of issues.

Actions that we believe Congress or others should take to speed up the Year 2000 remediation efforts. The unsettled legal environment is obstructing the ability of consumers of products or services from obtaining clear and timely information from those markers regarding their Year 2000 readiness. Second, we feel it would be helpful if the maritime industry would form action teams to share data on maritime related equipment and electronic processes in order to use leverage of the industry to ensure that the equipment and processes are properly addressed.

And finally, we would like to have a clear understanding from the foreign public sector as to the plans and status of the Year 2000 programs by the various agencies which could affect the international trade. Thank you very much for the opportunity.

[The prepared statement of Mr. Skillman can be found in the appendix.]

Chairman BENNETT. Thank you. Mr. Lofgren.

**STATEMENT OF CHRIS LOFGREN, CHIEF TECHNOLOGY
OFFICER, SCHNEIDER NATIONAL**

Mr. LOFGREN. On behalf of Schneider National and our Year 2000 projet manager Tom Kemp, in attendance here today, I want to thank Senator Bennett, Senator Dodd, and the other committee members for providing this opportunity to testify today. We believe the topic is timely and important to the trucking industry and while the issues and risks are significant, we have a great deal of faith in the trucking industry, working with their customers, that we will navigate successfully through this issue. As background, Schneider National is the largest truck load carrier in North America. We employ approximately 12,000 driver associates and 3,000 independent contractors. In addition, we operate a logistics company that contracts with over 1,000 third-party carriers, across all modes of transportation, in managing over \$1.3 billion in freight or freight bill for our customers.

We have a long history of being an industry technology leader, starting with being the first to deploy satellite communication to the tractor and continuing with our world class operational systems. By our very strategy, to leverage technology for low-cost operations and to deliver significant value to our customer supply chains, we have tightly integrated information and communication technology into both our business and to our customer's operation. We no longer have the luxury of being a technology island unto ourselves. As a result, we have been actively pursuing our Y2K remediation projects.

It started in May 1995 when one of our service team leaders inadvertently hit zero instead of nine and put a driver on vacation until 2005. [Laughter.]

It generated an error and thus began our Y2K project——

Vice Chairman DODD. With pay?

Mr. LOFGREN. What?

Vice Chairman DODD. With pay?

Mr. LOFGREN. No. Well, it would have been. Some 25,000 hours of effort later, we were poised within 7,000 hours of testing in early 1999 to be able to successfully continue the same customer service in the early days and weeks of 2000 that has fueled our growth in the past. As you have heard today and probably in the other sessions, it basically has come at a significant cost without much benefit for us.

From interacting with the third parties in our logistics business, we can make the following assessments concerning the trucking industry in general. Large carriers have or will be impacted by the Y2K issues but they most likely possess the technical staff and the financial resources to work through the issues if they have started early enough. Small carriers will most likely suffer minimal impacts. Most of these small carriers use pen and paper, spread sheets, some electronic mail through service providers that likely can be updated quickly. Medium-size companies are probably most at risk. Their operations are large enough that they rely on technology. In most cases, they implemented/purchased technologies with smaller IT staffs and therefore may not have the control of the software, the staff, or the financial resources necessary to address the problems in a timely manner.

With respect to Government's role in the Y2K challenge, we have the following comments. Any organization of size that has not started down the path of Y2K remediation is probably not going to be ready by January 1, 2000. Those that have would only be negatively impacted by new requirements from legislation. What is important: That Congress facilitate an environment of open disclosure both for innovative solutions to be shared to facilitate the collective progress of American business and for known problems that will not be cured to allow contingency planning to be developed.

This open environment is crucial but could be thwarted by individuals and organizations lining up to turn these disclosures into their private gain and liability for good faith providers of solutions and also good faith disclosures of unresolvable issues. We have provided the committee with a written statement both in terms of the survey and a statement for this testimony. Again, on behalf of Schneider National, thank you for the opportunity to participate and your commitment to ensure that American business and the American people will move successfully into the new millennium.

[The prepared statement of Mr. Lofgren can be found in the appendix.]

Chairman BENNETT. Thank you very much. Ms. Stevens.

STATEMENT OF ROBIN C. STEVENS, CHIEF, YEAR 2000 COMPLIANCE, NEW YORK METROPOLITAN TRANSPORTATION AUTHORITY

Ms. STEVENS. Good morning, Mr. Chairman, members of the committee. My name is Robin Stevens, deputy chief financial officer of the MTA and chief, Year 2000 Compliance. On behalf of the New York State Metropolitan Transportation Authority, I am pleased to participate in your hearing on the Year 2000 problem. I have provided a copy of my testimony and ask that it be entered in the record.

Chairman BENNETT. Without objection.

Ms. STEVENS. The MTA shares your concern and appreciates your interest in understanding the problem and its impact on mass transit. Before I speak about the Y2K issues facing us, I think it would be helpful for me to tell you a bit about our organization. We are the largest transit service provider in the Western Hemisphere serving a 14 million person, 4,000 square mile service area that covers 2 States, 14 counties and dozens of cities. While we are widely recognized for operating the MTA New York City Transit bus and subway system, we also operate the nation's two largest commuter railroads, MTA Long Island Rail Road and MTA Metro North Railroad, which serve New York City's eastern and northern suburban counties as well as two counties in Connecticut, and MTA Long Island Bus which provides intermodal connections to Long Island Rail Road and New York City Transit.

We are also the steward of Robert Moses' legendary Triborough Bridge and Tunnel Authority, now MTA Bridges and Tunnels, operating nine bridge and tunnel facilities. All told, the MTA carries over a quarter of all transit riders in the country, 6 million a day, many of whom use more than one of our modes daily.

We are very much cognizant of the impact we could have on our region if there were unresolved Y2K issues that affect our services. That is why I am happy to say to you that we are working pursuant to an executive order by Governor George E. Pataki to all State agencies and authorities to give priority to resolving Y2K issues. We have worked closely with the State's Year 2000 Project Office sharing information and coordinating regional issues.

Our story in some ways is more complicated and in some ways less than that of other transit systems. It is complicated by the fact that because of our size, we have many hundreds of software applications that support our train and bus services. We also however operate a transit system that due to the eras in which some of the critical operating systems were built has many critical aspects that are very manual in nature to this day and therefore not directly affected by software issues.

Nevertheless, we began our comprehensive Year 2000 effort in early 1995 beginning with understanding the extent to which our mainframe systems would be affected. An all agency effort was formalized with interagency workgroups and project teams. In early 1996, we began to define code to be remediated and identify other midrange and microsystems that needed remediation and systems that would be replaced rather than remediated. As we began to understand the size and scope of the effort, we realized we had to focus on critical systems. Later in 1996, we identified other areas

that could be affected by Y2K including embedded chip technology and continuity of goods and services from our business partners and suppliers.

Each of our operating systems agencies has its own project group led by its chief information officer and involving staff from both technology and operating departments. These groups report progress to each agency president on a monthly basis. MTA headquarters staff oversees the efforts of the agencies and prepares periodic reports to the finance committee of our board of directors.

To date, we have spent \$25 million for internal information technology staff involved with remediation, for consultants and for hardware and software. This dollar figure does not include the cost of systems that will be replaced. We expect that costs could exceed \$30 million before we conclude the project. Our program includes an audit component which requires agencies to document their efforts and test plans and results.

The agencies have identified approximately 357 application systems used in their operations. To focus our efforts and ensure that critical systems were remediated as early as possible to allow for recovery time for unexpected problems, we focused on critical systems and divided the work into critical and non-critical categories. We have a goal to remediate critical systems by the end of 1998. Completion is defined as remediated, forward date tested, and operating in a current production environment.

Some 141 systems have been identified as critical and all will be completed by the end of 1998 with the exception of 6 systems which will be completed by the first quarter of 1999. Computer chip technology has found its way into technical systems and mechanical equipment including telephone systems, communications devices, elevators, heating, ventilation and cooling systems, and Long Island Rail Road and Metro North Train equipment control systems and signal systems.

This may be one area, however, where the age of our systems has advantaged us. With the exception of one new technology test train, the entire subway fleet and subway signal system is not affected by embedded chip technology. This is different from the situation that newer transit systems may face. We do, however, have such technology in our systems. Agency staffs involved in train, bus and facility operations have completed a survey of critical physical plants and identified a total of 489 devices critical to our operation. They determined whether there is embedded technology, if the date function exists, if it's compliant or not, whether it is active or passive. Thirty-Five percent of the devices have been determined to have no embedded date function, no embedded technology or date function or to be compliant.

All critical devices are subjected to testing, even where the vendor has assured us that it is compliant. Our goal for completion for identifying and resolving critical embedded chip technology including the development of contingency plans is the end of first quarter 1999. We have identified a total of 1,244 critical suppliers. Letters seeking information have been sent to all of them. Our initial response was less than 25 percent. Second mailings brought that up to 40 percent. Where firms have not responded or not responded adequately, management staff is contacting them by phone or in

person to discuss compliance. We expect to complete our surveys by the end of the year and develop contingency plans by the end of the first quarter 1999.

This area is the most troublesome since we, as many other entities, rely on so many companies for goods and services including key ones such as power and telecommunications. We have no choice but to rely on the word of suppliers. However, in instances where a supplier is unique and critical, we are reviewing their efforts at a more detailed level.

Contingency plans are, as you know, an essential part of our business. Our standard plans address both isolated failures such as elevators not operating to larger system-wide failures. Agencies are reviewing those plans in the context of Y2K and will develop supplemental plans as needed.

As I mentioned earlier, New York State Governor George E. Pataki issued an executive order for all State agencies and authorities giving priority to the Y2K problem. The State has a Y2K project office with which we share information and participate in forums.

A Y2K Tri-State Planning Group was formed in July in an effort to enable various organizations to share knowledge and experience that could affect our region. The MTA and its agencies participate in this group. It also includes State, Federal, and city representatives as well as participants from the private sector. We believe that our extensive and comprehensive efforts to address the Year 2000 problem will ensure mass transit service through the millennium. Our early start, the involvement of senior management, as well as teams of staff from the many disciplines that manage and operate the vast infrastructure necessary for mass transit gives us confidence that we have thoroughly addressed the problem. We will provide any additional material you may require in your effort to reduce the risks of Year 2000 failures. Thank you.

[The prepared Statement of Ms. Stevens can be found in the appendix.]

Chairman BENNETT. Thank you. Mr. Skillman, you have raised a specter that frankly I had not thought of—that happens at all these hearings. You just get reassurance in one area and you get concern raised in another: The documentation that must accompany all goods that are shipped in international waters at an international port that cannot go forward. If you are shipping something that is perishable and you cannot get it out on time, even if we had the U.S. Customs thing all solved on this side and the port completely Y2K compliant in the United States, you could still run into serious difficulty getting the goods in a foreign part. Frankly, that had not occurred to me as a Y2K consequence until we had your testimony. So that is something new for me to worry about.

Let me raise with you—this is not your area of expertise because you do not operate literally in these waters, but I have to ask you because the trade association that represents your industry has been singularly non-forthcoming with information. I am sorry that that is the case, but their reaction to our inquiries was: Well, this is a problem that each individual member of our trade association is more than equipped to handle by themselves and we do not need to worry about it.

Oil coming into this country from Saudi Arabia, we learned 20 years ago, 25 years ago, is essential to our economy and if it is interrupted for any period of time, there is a serious recession that is created. Do you have any sense of what would happen in terms of offloading oil in the Persian Gulf and elsewhere because of Y2K problems at those ports, both in terms of the paperwork that would have to accompany it as well as the physical offloading on to the ships of the oil itself or have I asked you a question that is completely out of your canon? If it is, I will understand.

Mr. SKILLMAN. I would say it is about three-quarters of the way out of my scope.

Chairman BENNETT. OK.

Mr. SKILLMAN. There are certain pieces——

Vice Chairman DODD. You got to speak close to that microphone. We cannot hear you if you do not. Right up close to it.

Mr. SKILLMAN. I would say it is about three-quarters of the way out of my scope. The vessels themselves like everybody in the industry, we are doing checking of our own systems. As far as how you unload it, you would have to deal with the different environments of their automation. As far as the documentation and the paper, it really will boil down to the individual countries and what they determine as their alternative approaches. It would be very nice to be able to have those conversations prior to that timeframe so there is consistency between the different lines, between the different countries, and that you are not dealing with it one way with one country and another way with another country.

Chairman BENNETT. Mr. Downey, do you have any conduit through which you could have these discussions? Should it go through the State Department?

Mr. DOWNEY. That is occurring through the State Department and through the embassies as well as through some international organizations. I know we just completed a questionnaire for APEC on behalf of the U.S. Government. They are attempting to get the same information from all the countries within APEC and I think other similar efforts are underway to at least assess what the situation will be with respect to Customs, which will not only be a port issue but I also point out a land border issue in this country where the movement of the data that accompanies the goods is oftentimes the holdup and we could have serious problems if that data is not moving.

Treasury Department and Customs are on our sector group for transportation because we recognize that those have to work together and in the council, and we will both through State and through Treasury be working on this.

Chairman BENNETT. Mr. Lofgren and Ms. Stevens both, in conversations with the Federal Highway Administration preparatory to this hearing, pointed out that one of the challenges that we face with Y2K has to do with stoplights. Particularly in the Washington area if the stoplights do not work, the burden placed on mass transit would be very significant. And Mr. Lofgren, I am sure that trucks have to unload somewhere and they are not always at big terminals that are out of town, that there has to be a concern about the gridlock that would occur in the cities in terms of your ability to deliver goods if the stoplight system breaks down.

I do not suppose you have any information. Maybe Ms. Stevens, since you work for a public entity and the public entities run the stoplights, you have had some conversations with some folks. Is there any light that you can shed on this subject, not to make a pun out of it?

Ms. STEVENS. Well, we have been assured by the city of New York that their traffic control systems, their streetlights are Y2K compliant. We have been working with them in interagency workgroups.

Chairman BENNETT. Mr. Lofgren, have you talked to anybody in any of the municipalities where you operate to find out about that?

Mr. LOFGREN. No, I think we will probably handle it very similar to how we handle when we have to deliver in Manhattan. You know I think that it certainly poses a critical issue in terms of how we are ultimately going to deliver and do so in a timely manner, but it has not been something from a contingency plan that we have to deal with. Ideally, we will be able to communicate with the driver through the satellite system so we will know as it starts to occur and probably be able to notify drivers inbound before they encounter the problem to take action. They can, you know, stop at one of our operating centers or other truck stops until that gets resolved.

Chairman BENNETT. OK. Ms. Wrenn, Union Pacific had some difficulties by virtue of their merger with Southern Pacific. They were not necessarily Y2K difficulties, but they were computer difficulties. I personally can identify with those. I used to be vice president of an airline that was formed by the merger of three smaller airlines. The merger took place at midnight and at 12:01 disaster struck when we discovered that the computers could not talk to each other. There were literally telephone calls to airport managers saying will you go out and look in the back hangar and see if there is one of our planes there? It is big with blue paint on the tail and, you know, call us back if you can find it because they just went off the computer screens.

Union Pacific has worked through those problems and your level of service is back now to where it was before you had those difficulties and I commend you for that. But do you have any experience that you might share that you think would be useful as to what happens when computers cannot really function the way they are supposed to?

Ms. WRENN. Well, I guess I really need to clarify what happened in the past year and a half as we have been merging the Southern Pacific into the Union Pacific, and that was all completed from a computer standpoint July 1. Actually, the systems were merged together technically very well. There were no outages or glitches. We maintained the Southern Pacific systems for a period of time along with the Union Pacific systems and by territory merged pieces of the Southern Pacific Railroad into the Union Pacific and encompassed that portion of the railroad into the Union Pacific systems.

We determined early on, because Union Pacific was larger, that the business processes to run Union Pacific would be the ones that we would run the merged company with. Consequently, that caused some difficulty in learning the business processes, from the Southern Pacific's way of doing things to the Union Pacific's, and there

were some problems there as well as training, although we did extensive training in the Union Pacific systems which are not new. I mean Union Pacific has had them installed for many years.

There were, as you would expect, start-up problems in people in understanding how to use the system, and so each time we put more people into the field to do the training and so forth. The last cut over in July was very smooth, to solve any problems we even had an open conference line. So we are experienced in how to handle these kinds of situations where we had a 24-hour open conference line to resolve any issues as they occurred. That piece went very smoothly. And I am sure that today people are very comfortable using the systems.

There was a lot of misunderstanding, I think, in terms of the nature of the problems when we merged those two companies. From a technical standpoint, the computer systems did come together very easily, and when I say easily, I mean cleanly technically. It is the business processes and the training, getting used to these new systems, that I think took some time. Now what we are doing with Y2K is making compliant with Y2K all of these Union Pacific systems, and that will then be transparent to the users of the systems. In fact, since we have most of them now tested—the main-frame area—we put them into production as soon as we have tested them for Y2K compliance. They are running the railroad today. So they are in operation. And there is not any perceptible difference to that end-user of the system.

Thus, the problems were more a merging of two different cultures than computer systems that did not talk to each other.

Chairman BENNETT. I see. Thank you. Vice Chairman Dodd.

Vice Chairman DODD. Thank you, Mr. Chairman, and I thank all of our witnesses here for your statements. Just going over, as I mentioned with the airline industry, just to put it in perspective, I went down just collecting the basic data and information about systems; I think it may be interesting. As we have it, in the railroad area there are some 700 railroads operating in the United States that cover almost a quarter of a million miles of track, there are 20,000 locomotives, and 1.2 million freight cars operating in the United States, and over 265,000 people work in the railroad industry in the country.

Amtrak has 20 million intercity passengers, 48 million commuter passengers, 300 locomotives, and 1,700 passenger cars. The maritime industry and ports, 16 million jobs nationwide directly linked to maritime. I do not have the number of ships and so forth in this data, but just indication with your company give a size of the magnitude. And trucking, there are 400,000 trucking companies in the United States. There are about 80,000 fleets that have 10 or more trucks. Some 77 percent of all our communities in this country rely exclusively on trucks to get their produce and supplies in and out of them. There are about 9.5 million people employed in your industry, and in 1996 alone, trucks traveled 166 billion miles in the United States. I think many of those are in Connecticut. I see them on the road all the time. [Laughter.]

Public transit, there are almost 6,000 transit U.S. transit agencies in the United States covering 3.7 billion miles, 246 million hours of annual service, and employing 300,000 people. I mean just

the magnitude of this industry in terms of its economic impact and from an employment standpoint, not to mention the interagency, which raises the question, Mr. Downey, so much of what we are talking about here is dependent on what happens locally. I am talking about traffic lights and so forth, but one of the things we are trying to promote in Connecticut is the intermodal transportation needs of my constituencies, people who travel from Connecticut to New York to go to work everyday, Fairfield County, for instance, and you will understand this, Ms. Stevens, many of them, you know, parking lots are filled. You have a waiting list now to get a parking space next to a train station in Connecticut.

They are as valuable as real estate to be able to get one, you know, so how people can get from the rail system, their cars or bus systems and so forth, I do not need to make the case to this panel. You understand there are modal needs. And I am wondering, Mr. Downey, if you could comment to what extent the Department of Transportation has been focusing some attention on the notion of intermodality that is going to be critical and represented by the various modes of transportation that are gathered at this table today where to the extent they are able to interconnect, it is one thing for computer systems to talk to each other in an similar industry, in the same industry, in rail and airlines. But will they be talking to each other from a local to a regional system, for instance, in terms of the Y2K issues?

Mr. DOWNEY. This is key to success in the transportation business whether it is Y2K or any other year. The intermodal operations—

Vice Chairman DODD. And is not just people; it is goods and services, too.

Mr. DOWNEY. Yes, goods and services, right.

Vice Chairman DODD. That ship that arrives at a port relies on a train system or an air system that is going to deliver it to a truck that is going to then deliver to a community. So I mean it all—

Mr. DOWNEY. All of these things have to work together. Fortunately we have developed, I think, some good relationships, building out of the legislation, ISTEA legislation of 1991, and added to by the TEA-21 legislation this year. We really have gotten the public agencies and the private sector who move people and goods beginning to recognize the importance of intermodal transportation. Transportation does represent about 10 percent of the GDP and clearly could be a real deterrent to economic growth if it is not working well.

The thing that has knitted it together in recent years has been what we call intelligent transportation systems using computer technology to make these systems interrelate and work together, and we recognized Y2K could be an Achilles heel in this area. We held a conference earlier this year. We will hold another one in the early part of next year to see that this intelligent transportation systems area is ahead of everybody else in worrying about this issue and really taking the lead in making sure the systems do work together. Stoplights, for example, we could have everything else fixed, and if all the lights are blinking red, nothing will be moving. So we pull together the professionals in the transportation industry, the Institute of Traffic Engineers, the State highway offi-

cial, public transit officials, trucking industry, and got them to begin to talk to each other and we will follow up in January to be sure that they are making progress on how these modes do inter-relate. It is critical.

Vice Chairman DODD. Again, I think it is important to keep us posted and also ideas and suggestions I mean can be helpful that we can convey to our own respective States and localities, and I know our colleagues would be very interested in knowing ways in which they can be cooperative in assisting in this.

Mr. DOWNEY. Coming out of that summit meeting, we actually have produced a brochure—it should be off the press within the week—of tips as to what the transportation agency should be doing to get ready, and we certainly want to work with you on getting the widest possible distribution of that information.

Vice Chairman DODD. Thank you. Ms. Stevens, obviously you bring the issue directly home to me. All of you do. I have ports and rail lines and obviously a lot of trucking in my State and major companies in my State in trucking. But also mass transit is a big issue for us in the Northeast. You have heard Senator Bennett and I raise concerns about the response of partners, private and public partners in these issues, and you pointed out in your statement that the response rate by your critical business partners—those are your words, the critical business partners—has been abysmal: 40 percent of the 1244 critical suppliers.

You indicated that to achieve even this level, you needed to send second letters as well as follow-up phone calls. I just want to take this opportunity to—again we would like to the extent we can help—I would like to know who they are? Who is not even getting back to you on this stuff? And it goes through right across the spectrum. I have said this over and over again, but here we are with 477 days, I think, one witness indicated before this clock runs, and if people do not have enough common sense to understand the importance of this, I think we ought to know who they are and use whatever vehicles we have available to us here to make the case that do not go running to court claiming ignorance at some point because that is what this may come down to for a lot of these people.

And so I would like to know from you if you can keep us posted as to who these people are that are not responding to your systems. And I would like to know what your contingency planning for a massive public transportation system such as the MTA is if, in fact, it crashes.

Ms. STEVENS. Well, we are very confident of our ability to operate. As I mentioned, we will have our major systems remediated—our major application systems—remediated by the end of this year with the exception of a few, and it is very achievable to get those finished by the end of the first quarter of 1999. With embedded chip technology, we are finding although we have it, it basically often does not include date calculations that affect the operation of the system. We can operate the system. Maybe it is a maintenance device that has a recording function as well, and that function may not record accurately the date, but the device will still at its most elemental level operate its most essential level.

Vice Chairman DODD. Let me try to come at this a different way. Do you have a contingency plan?

Ms. STEVENS. We have contingency plans as a normal routine operating matter.

Vice Chairman DODD. No, I understand, but for this?

Ms. STEVENS. And we are supplementing those for what we think might happen here. Those are being developed.

Vice Chairman DODD. So we do not have one yet?

Ms. STEVENS. They are being developed. They are in various stages of preparation for the various aspects of the systems. We think for the most part we will be able to remediate embedded chip technology where we have problems with it.

Vice Chairman DODD. I understand that. I express your confidence level. But we are looking at a system here that has huge implications if it does not work right.

Ms. STEVENS. We understand that. We understand that fully, and we are prepared for this.

Vice Chairman DODD. But you know when you got 40 percent of your suppliers in critical areas that are not responding to your letters, you got 477 days to go. I think, hell, you know, we ought to have—excuse me—we ought to have a contingency plan here pretty quickly.

Ms. STEVENS. Well, we are working to develop those and we also—I think the suppliers are very concerned about their legal liability, as everybody else has expressed on the panel. I suspect that most—

Vice Chairman DODD. You do not accept that answer, do you, as a reason for not responding to a Metropolitan Transit Authority?

Ms. STEVENS. No. That is why we are continuing to speak with them and continuing to go after them, but it is a reality that that is their concern.

Vice Chairman DODD. I mean I would make that as a prima facie case of guilt you did not respond, let alone defense.

Ms. STEVENS. I think that more of the suppliers are probably ready than they are ready to commit on paper already.

Vice Chairman DODD. Have you had any experience where vendors have certified the devices are compliant and, in fact, they have turned out not to be? We had heard that now from several witnesses.

Ms. STEVENS. Yes, we have. And that is a reason that we are testing devices even where we have a vendor certification.

Vice Chairman DODD. You are not relying on that certification?

Ms. STEVENS. No.

Vice Chairman DODD. Have you found that is it more than just anecdotal? Any indication of how widespread that is?

Ms. STEVENS. No, it is not pervasive. It is on an exception basis that we have had that problem.

Vice Chairman DODD. All right. I hope you will keep us posted too on this and how things are going.

Ms. STEVENS. Yes.

Vice Chairman DODD. I wonder if you, Mr. Lofgren, can give us some indication of what you perceive as a showstopper in the trucking industry with the Y2K issue? I kind of understand airplanes and shipping, I think, and rail, mass transit obviously.

Trucking seems a little bit more removed from this issue, at least in my mind, and yet obviously you have indicated that there is a tremendous dependency today on this sophisticated technology in your industry. So give me some indication here of what could be as I described a showstopper in the trucking industry with a breakdown in the system?

Mr. LOFGREN. Well, clearly for us, one of the issues that we are trying to understand is how we are going to handle issues in the power grid? We pretty much run centrally out of Green Bay, WI so we look at issues around making significant investments in a generator. We are already hooked in from two different power grids but if regionally they go down, what is the issue there, and how far does this go? So the issues around power and the utilities is one for us from an operating standpoint and telecommunications is another big one. Those are probably the large ones. We have the luxury that we do not have things up in the air that are subject to gravity, you know. They are already touching the ground. So—

Vice Chairman DODD. You have got the GPS system that you use.

Mr. LOFGREN. Actually we do not rely on GPS. There is another form of satellite triangulation from QualCom who is our supplier of satellite communications that runs that, and we have been assured that that is Year 2000 compliant. So I think that it is just the issues of how do we exist in this very, very integrated supply chain. The example is a number of our automotive manufacturers that were running in freight just-in-time. The question is what will happen when these issues crop up? To the extent that we find alternative ways to communicate across a pretty wide geography if we lose the telephones, then we have mechanisms to continue tightly coupled services? And so there probably will need to be put in place some contingencies to somehow let people be aware as things may break down. But, you know, for us, I guess, we have kind of gone around the block a number of times.

We feel pretty good about where we are positioned, and we ask what are we missing? I think a lot of the issues come at the integration point with other suppliers and customers as opposed to anything substantially from our operations. So it is timing and effectiveness and levels of service that are probably as much the issues that we are dealing with.

Vice Chairman DODD. Yeah. The clock has run out here and I have got some other questions, Mr. Chairman, if we could submit I presume to our panel here?

Chairman BENNETT. Yes.

Vice Chairman DODD. And I hope you would all be willing to respond to them. We will submit them to you.

I was concerned, Mr. Skillman, when the chairman indicated that we have not had as much response. I think you were addressing this to Mr. Skillman.

Chairman BENNETT. Yes. Yes, it was not necessarily his company.

Vice Chairman DODD. No, no, I understand that.

Chairman BENNETT. But his trade association has been very unresponsive.

Vice Chairman DODD. Are you out of Crowley, LA? Is this where?

Mr. SKILLMAN. No. Oakland, CA.

Vice Chairman DODD. Oh, Crowley. You mentioned the Caribbean and the Gulf areas. Well, I would hope you would go back and convey that we appreciate your presence here today and your willingness to be before the committee, but let me also take advantage of your presence here to ask you to be the messenger back to your industry here that they have got to be more responsive and obviously the trade associations can play a pivotal role here in communicating most effectively to their individual members the importance of this issue and I would hope you would be willing to carry that message back for us here today. We will convey it as well to your industry, but it would be helpful if you would also bring it. And let me just briefly ask you what international concerns you have?

We talked earlier and listened to Ms. Garvey and others, obviously Secretary Downey, talk about their deep concerns about international travel in the air industry. Tell me briefly, if you can, what concerns you have in the maritime industry about this issue of Y2K as it affects shipping worldwide.

Mr. SKILLMAN. OK. First of all, yes, I think it is a great idea to try to get the other lines involved and I will do so.

Vice Chairman DODD. Thank you.

Mr. SKILLMAN. As far as the foreign aspects, and again I limit that to our trade routes are for the most part Western Hemisphere, Latin America, Central America, Caribbean.

Vice Chairman DODD. Right.

Mr. SKILLMAN. We do have a lot of concern. The assumption is if those organizations whether they are governmental or private do not get themselves Year 2000 compliant, it slows down the whole process, whether it is documentation being held up, whether it is ships being held up, whether it is the supply chain for major companies heading either south or north. So it really does throw a real wrench into the operations for everybody. There will not be a shipping line that is a winner and one that is a loser. Everybody will be in the same boat when it deals with the foreign entities. Again, Europe will deal with different problems and the Far East will deal with different problems as well. But, yes, we have problems in most of the countries we deal with.

Vice Chairman DODD. OK. Thank you. Mr. Chairman, I thank you very much.

Chairman BENNETT. Thank you. Secretary Downey, you mentioned TEA-21, and this is the first opportunity for State and local governments to tap into Federal funds for Y2K efforts. Have you issued any guidelines to these agencies as to how they can make application for grants and have you received any applications so far?

Mr. DOWNEY. I am not aware of any we have received. We have issued guidance through our State and regional offices. It is the normal process because these are the normal funds. It should be a programming choice that a State or a transit agency would make to take the funds that come to them under the formula and allocate them for Y2K remediation purposes. We certainly have publicized the fact that they are able to do that and as I said we are encouraging them to do that.

Chairman BENNETT. One of the crusades I am on is to make sure that we do not have Y2K problems because we do not have the money.

Mr. DOWNEY. Right. As we have said to the States, the money is there. If they say but we need it to build a highway, my answer has been you can do that next year.

Chairman BENNETT. That is exactly right. The money is there. I do not want an entity, whether it is the Federal agency or a State agency, to say oh, my gosh, the Federal treasury doors have just swung open and in the name of Y2K, we can run and loot the treasury for whatever purpose we want and say this will be the Y2K memorial courthouse, this will be the Y2K [Laughter.].

Vice Chairman DODD. Talking about a CETA program.

Chairman BENNETT. Right. Right. But we have insufficient time, we have insufficient people. It would be intolerable if we exacerbated the problem because we said, well, we did have the people available and they could have done it in the time available, but we did not have the money. And that is why Senator Stevens and Senator Byrd are ex officio members of this committee. Senator Stevens, as you know, initiated the emergency fund which is now up in excess of \$3 billion and it is a true emergency. I say to my colleagues in the House this is a true emergency and do not hold this up trying to find an offset for it. This is inside baseball talk that some people in the room might not understand, but all the budgeteers understand it.

Mr. DOWNEY. I understand and we agree.

Chairman BENNETT. And it sounds strange coming from a conservative Republican that says let us spend money before we do an offset for it, but we can get back to our ideological purity after we get this problem behind us. I would hope you would continue to stay in close touch with State and local DOT's, not only for the obvious things, but for things like traffic lights and other situations that could cause us serious problems. We will undoubtedly be submitting additional questions to you. Let me thank all the members of the panel, thank your organizations that allowed you to come, recognizing as I did at the outset that there were some organizations who did not allow a spokesperson to come, and that is one of the most distressing things about this.

I would also include for the record the written testimony of Steven Roberts of the National Passenger Railroad Corporation.

[The prepared testimony of Mr. Roberts can be found in the appendix.]

Chairman BENNETT. The one final caveat I would give to people who are following this issue is that while the testimony today has been quite encouraging, both from the first panel and from the second one, we have to remind ourselves that these are the people who are willing to come forward and tell us where they were. And as I began, the information from the survey conducted by this committee is very disturbing in that it indicates that there are a number of people who are not willing to come forward. They may be hiding behind the advice of their lawyers or they may, in fact, be covering up the fact that they are far from ready. That the somewhat encouraging picture we have gotten today may not be the

true picture when you get beyond those who are willing to speak. So again we are grateful to you for your willingness.

Secretary Downey, we are grateful to you for your willingness to stay through the whole hearing and participate all the way through both as our lead-up witness and as our final witness. And we are grateful to the Department of Transportation for its focus on this issue. The hearing is adjourned.

[Whereupon, at 12:25 p.m., the committee was adjourned.]

APPENDIX

ALPHABETICAL LISTING AND MATERIAL SUBMITTED

PREPARED STATEMENT OF CHAIRMAN ROBERT F. BENNETT

Good morning and welcome to the Committee's sixth hearing on the Year 2000 technology problem. As in our past hearings on the energy utilities, health care, telecommunications, and financial institutions, I believe we have assembled an excellent set of witnesses. I look forward to their help in defining the scope and severity of the Year 2000 problem in the transportation industry. Today's hearing will explore the obvious safety and convenience concerns for the traveler, as well as the potentially paralyzing effect the millennium bug could have on businesses that are increasingly reliant on technology, "just-in-time" inventories, and prompt transportation of manufactured goods. We are also releasing today the results of a staff survey of the transportation industry that is very disturbing.

Let me begin by saying that transportation is the "lifeline" of our global economy. Everyday, thousands of American corporations and businesses depend on air, rail, maritime shipping, trucking, and mass transit to safely, reliably, and economically move millions of people and goods essential to their operations. There are 13 major and over 50 regional U.S. airlines, 7 long-haul and more than 500 short-haul railroads, over 80,000 trucking companies, about a dozen U.S.-flag-maritime shippers, and about 6,000 transit agencies that generate more than \$500 billion in revenues. More importantly, they support businesses generating many billions more in revenues. A Year 2000 related disruption within transportation could be more debilitating than any major corporate strike.

I am concerned that the transportation sector as a whole may not be able to transition through the millennium without major disruptions. That is not to say that most of the individual companies that make up the sector are not working hard to correct the problem, rather the interdependencies of these companies with their partners and suppliers both foreign and domestic make the transportation sector extremely complex, and, thus, make Year 2000 issues difficult to address.

As with other industries, technology is becoming increasingly important to the transportation sector, from the airline reservation and air traffic control systems to the dispatch and driver log systems that are increasingly prevalent in the trucking industry. Indeed, the level of automation in today's freighters, super tankers, and ports would make it difficult to operate without computers.

One example of automation in the transportation sector is the Global Positioning System (GPS). Simple receivers such as this one (hand held example) have revolutionized navigation in maritime shipping. This device makes it possible to, with pinpoint accuracy, determine one's location anywhere on the globe. For example, I can tell you that this hearing room is precisely at 38 degrees, 53 minute, 32 seconds north latitude and 77 degrees, 00 minutes, 21 seconds west longitude. GPS use is increasing every day in the transportation industry to track freight, trucks, and rail cars, and help stranded motorists find their way. However, while the satellites and ground stations will be ready, there are over 60 manufacturers of receivers (such as this one) used in thousands of applications that may or may not be Y2K ready.

Now, I'll share with you some of the complicated Year 2000 issues facing the transportation industry. If tomorrow were the Year 2000, the airline industry would not be ready. While airplanes will certainly not fall out of the sky, there are nonetheless serious problems facing the industry. First and foremost is flight safety. Jane Garvey, who we will hear from today, shoulders the Herculean task of making sure that FAA's air and ground traffic control systems will be ready for the Year 2000. However, FAA's systems are extremely complex and testing is not yet complete. I am concerned that there may be too much to do and too little time to do it.

The airlines, airports, and all of the suppliers and partners they depend on must also be ready. Critical systems such as aircraft maintenance and passenger ticketing and reservation systems could fail and cause reduced capacity, flight delays, cancellations, and customer discord. Airport runway lighting systems, fire fighting equipment, building and jet way security systems, parking systems, or even the Texas pipeline that supplies jet fuel to the eastern seaboard could cause closure of some of our busiest airports if Year 2000 problems are not aggressively addressed. I am concerned because a survey being conducted by the Air Transport Association shows that 38 percent of the airports surveyed do not yet have a Year 2000 plan.

The other transportation modes also have serious Year 2000 problems. For example, maritime ships have over the years become more highly automated, as have the ports and the equipment used to off load cargo. In addition, many shippers are concerned about whether the U.S. Customs Service systems used to clear freight will continue to operate and ensure the uninterrupted flow of imports and exports. They are also concerned about the ability of the Coast Guard to ensure safe operation within the ports if their systems are not Y2K ready.

Ever increasing automation within the railroads, the trucking industry, and our nation's mass transit systems make the Year 2000 a formidable challenge for them as well. Let me take this opportunity to clear up another Y2K "myth." The railroads assure us that the computers can be overridden and the rail switches can indeed be manually switched in contrast to earlier reports by individuals who were obviously misinformed. Nevertheless, the railroads face significant challenges with their train control systems as well as their dispatching and scheduling systems. City officials also face significant problems with traffic lights, easy pass toll systems, and traffic monitoring systems. The New York Transit Authority, which we will hear from today, has six million riders a day. They must address Y2K issues in mass transit bus and subway ticketing systems as well as systems integral to the basic operation of the subway.

Finally, we are releasing today the results of a survey conducted by the Committee staff to assess the overall preparedness of the transportation sector. We undertook this survey because, as in previous hearings, we have found that such assessments are not available from any other source, public or private. The charts (displayed) show the results of the survey, and they are a little disturbing. First, we targeted a total of 32 airlines, airports, railroads, maritime shippers, trucking companies, and metropolitan transit authorities. Despite well over a hundred telephone calls to offer assistance and encourage results, only about 50 percent responded (the 16 companies displayed on the tables). We made this survey so simple that I can only conclude that those who didn't respond are either unaware of the severity of the problem or are embarrassed over their lack of progress.

As you can see in the table, only one third of the companies responding to the survey have completed assessment of their systems—a task that should have been finished over a year ago. In addition, only half have begun contingency planning. Keep in mind that we only surveyed leaders in the industry with the vast resources to apply to the problem, so presumably others in the industry are farther behind.

With the hard part yet to come—testing and implementation—I am forced to conclude that there may be significant interruptions in the transportation industry. I have often said that there are three places I don't want to be on January 1, 2000—an airplane, a hospital, or an elevator. I haven't changed my mind, but I'm hoping our witnesses will help me do that.

PREPARED STATEMENT OF SENATOR CHRISTOPHER J. DODD

Thank you Mr. Chairman, I am pleased that we are continuing to review the year 2000 readiness of industry and government. To date we have had a series of very important and informative hearings covering utilities, banking and finance, telecommunications and health care. These have been important hearings and quite frankly, I have been both heartened and at times very concerned as to the level of year 2000 preparedness. Indeed, some agencies and some corresponding industries are well along the way to becoming ready for January 1, 2000. Yet many are not, or rather have been slow to commit the necessary resources to meet this mammoth challenge.

The potential repercussions and disruptions due to inadequate year 2000 preparation to our industry, commerce and financial systems become readily apparent and are extremely important, however, there are some industries and sectors where a failure in mission critical systems is bone chilling. One of these areas became apparent during this committee's health hearing. In that hearing the critical nature of

medical devices, * * * for example, whether a cardiac monitor will function, was apparent to everyone.

Today's hearing covers some similar critical ground. Perhaps the most frequently asked Y2K question concerns whether our airlines will fly and fly safely on the minute past midnight on January 1, 2000. However, inherent in this question is a thousand other questions that relate to airports, navigational systems, airline maintenance and airport security just to name a very few. Some of these same concerns can be related to our highway system, our trains and our urban mass transit apparatus. Year 2000 malfunctions in the area of transportation are at their best an inconvenience, they can escalate to cause serious commercial palpitations, but they must not and cannot put our citizens at risk.

Just this week, I received the office of management and budget's most recent progress report on year 2000 conversion. This report tells us that the department of transportation has improved its management oversight and has accelerated the rate at which the FAA is remediating air traffic control system components and the report indicates that at the end of July 1998, the department of transportation's percentage of mission-critical systems renovated stood at 65 percent, a significant improvement over the 25 percent reported in the previous quarter. This is good. However, with 10 percent of its systems tested and 3 percent implemented, it remains significantly behind schedule. Clearly progress is being made and clearly more needs to be done. In OMB's government-wide summary the department of transportation is rated as a tier one agency. Unfortunately tier one denotes a troubled agency, with tier three being the best.

Nonetheless, I am pleased that we have such distinguished witnesses which represent a broad spectrum of transportation. It is crucial that our planes fly that our ships dock and that our traffic lights and subways run smoothly. We all have the same purpose here * * * that all Americans wake up on January 1, 2000 to the same safe and functioning environment that they knew the day before.

PREPARED STATEMENT OF MORTIMER L. DOWNEY

Senator Bennett, Senator Dodd, Members of the Committee: Thank you for the opportunity to testify on the transportation industry's efforts to prepare for the Year 2000 problem.

Let me thank you for your leadership in this matter. Congress, and especially this Committee, has been extremely supportive of the Year 2000 initiatives that the Administration has been putting in place, and we look forward to continuing this important partnership.

It's crucial that we do so. Like other sectors, transportation and its users have benefited from computer-based technologies. These technologies are primary tools in transportation: they have enhanced safety, doubled the effective capacity of our air traffic system, upgraded air and sea navigation, improved highway traffic flow, and made possible efficient, "just-in-time" deliveries.

The technologies that contribute to the safe, smooth, and productive functioning of our transportation system today can generate even greater benefits in the future through such computer-based enhancements as "free flight," Positive Train Control, Intelligent Transportation Systems, and similar measures.

However, we face a challenge in the Year 2000 problem, one that, unmet, could pose risks to safety and disrupt the flow of commerce. That is why President Clinton and Vice President Gore have made solving the Y2K problem a top priority for them, for us, for their Administration, and for the country.

Within the Department of Transportation, we've made substantial progress in repairing our own systems: 46 percent of the Department's 616 mission-critical systems have been tested and certified as Y2K-compliant.

Although we've found that enthusiasm for getting the job done has caused progress to be overstated in a few areas, such as air traffic control, we believe that we will substantially meet OMB's September 30 milestone for renovation. Jane Garvey and the other heads of our operating administrations are committed to keeping our program on track, Secretary Slater and I are increasing our scrutiny of problem areas to make sure that we do so, and our Inspector General is verifying all progress reports.

Our concerns, however, aren't limited to how the Year 2000 problem directly affects the federal government. While transportation operations are typically the responsibility of the private sector, ensuring their safe, smooth functioning is a matter of national concern.

In cooperation with the President's Council on Year 2000 Conversion, we're encouraging our partners to evaluate their own systems and to make any needed fixes.

Given the nature of our regulatory authority, which typically focuses on results, we can't compel system operators to take particular assessment or repair steps, nor can we perform universal evaluations of their repairs.

However, we can, and must, raise awareness and make it clear that solving this problem is not just a public and a corporate responsibility but is, in fact, good business. We also can promote the sharing of effective strategies to ensure the system's safe performance.

We're now conducting outreach to identify progress in the various transportation sectors, and to determine how best we can support repair efforts. We've found several cross-cutting issues, which I'll summarize.

Many private companies are reluctant to report or share information for fear of liability, making surveys at best incomplete and at worst over-optimistic. Some sectors, such as airports and shipping, have an emerging awareness of the problem, which points to the need for continued and expanded outreach.

Foreign airlines and shipping companies, especially those in less-developed countries, also appear to have limited awareness and few resources to deal with the problem.

Many large enterprises, including all U.S. airlines, have active repair programs in place. However, like small businesses in other sectors, many transportation suppliers and smaller operators are behind the curve.

Transportation's dependence on other sectors, such as energy and telecommunications, means that we could have transportation failures even if this industry is itself Y2K-compliant. Underscoring our interdependence, such sectors as agriculture and energy in turn rely on efficient transportation to get their products to consumers or their fuels to power plants.

Finally, there is uncertainty over the impact of embedded chips because of their varied uses and a lack of documented manufacturers' information. However, most of the chips in transportation applications seem to be event-oriented, focused on operating cycles rather than dates, so there is a growing consensus that their Y2K effect will be comparatively minimal.

Based on these early discussions, we're taking steps to assist our partners. We've met with industry associations and businesses in every sector, and have held industry-wide forums for aviation, maritime, rail, pipelines, and surface transportation.

We're also reaching out globally, especially through the International Air Transport Association, the International Civil Aviation Organization, and the International Maritime Organization. Secretary Slater has raised the issue at such forums as the European Conference of Ministers of Transport and during bilateral discussions such as those during his recent mission to Africa.

Products such as our forthcoming Year 2000 website and our "Steps for Action" guidance for Intelligent Transportation Systems will provide needed information.

We've urged states and localities to use their regularly-allocated federal highway and transit funds for Y2K repairs to Intelligent Transportation Systems components such as traffic signals or traffic surveillance cameras. And, in certain circumstances, airports are eligible to receive Airport Improvement Program funds for Y2K.

Although the Defense Department has told us that the Global Positioning System itself won't have Y2K problems, the GPS receivers used in civil transportation may not be Y2K-compliant. Through the Coast Guard, we're advising civilian users to contact manufacturers to ensure that their GPS receivers will work.

We'll also work with operators under the umbrella of the President's Council to develop contingency plans for each transportation mode and for its connecting modes. It's vital that every industry have plans to continue the safe and orderly flow of commerce even in the wake of failures, and we will facilitate industry efforts to create such plans.

Finally, we'll use our existing authorities to take whatever actions are necessary to ensure transportation safety. We will be ready to step in to restrict or even shut down operations made unsafe because of Year 2000 problems.

For example, the FRA could issue emergency orders to restrict a railroad's operations, the FAA could limit or halt an airline's flights, or the Coast Guard could require special handling for tankers entering harbors. We hope that such steps won't be necessary, but we're fully prepared to take them to protect the public as we maintain the flow of commerce.

Let me conclude my statement by answering your question about what Congress can do to reduce the risk of Year 2000 failures.

First, I ask that Congress pass the President's proposed legislation to protect from liability those who, in good faith, share information on this problem. That would alleviate some of the concerns about sharing data or making reports.

Second, I ask that Congress enact the President's proposed fiscal year 1998 contingent emergency funding for Year 2000 computer conversion activities. Ensuring

Y2K compliance will require flexibility to respond to such unanticipated requirements.

Third, I ask that Congress be cautious in considering any laws mandating specific steps for Year 2000 compliance in the transportation industry. Specific, new laws or regulations could unnecessarily burden industry and, perhaps, limit its flexibility to respond to a fluid situation. I also ask that Congress carefully consider the impact of other laws on the Year 2000 effort, just as we at DOT are looking closely at new regulations to ensure they don't add to the burden.

Finally, I ask that you continue to exercise leadership on this issue, raising awareness among your constituents and the general public.

The partnership we've forged with you on this issue has been increasingly successful, and we look forward to continuing to work with Congress in the coming months.

If there are few problems, and I hope that is the case, we can give that assurance to the American people before unfounded rumors and fears have become widespread. We owe it to ourselves, to our citizens, and to the future of our transportation industry. Thank you.

RESPONSES OF MORTIMER L. DOWNEY TO QUESTIONS SUBMITTED BY
CHAIRMAN BENNETT

Question 1. Mr. Secretary (Dept. of Transportation), testimony from several sectors of the Transportation Industry indicate a global concern for Y2K issues beyond the boundaries of the United States. What are the implications on the U.S. transportation industry if international air space, airports, seaports, etc., experience Y2K problems? What is your Department doing in conjunction with the State Department and other U.S. Government agencies to bring these Y2K issues to the attention of the foreign governments involved?

Answer. Global commerce may be affected if the Y2K problem is not addressed successfully. Any significant disruption of international air space, airports, seaports, railroads, and other means of conveyance of people and materials could cause widespread operational problems for the U.S. transportation industry. The degree of impact may depend on how much commerce the United States has with the affected countries. For example, if international air traffic systems are not Y2K compliant, our air carriers may have to deviate from established flight plans to avoid entering foreign airspace controlled by a non-Y2K compliant air traffic system. If international airports are not compliant, our air carriers may be unable to deliver passengers and cargo to those destinations causing significant disruption. Also, our seaports are of critical importance since they receive the vast majority of our commercial goods.

The Department worked with the State Department to include language in a cable that requested U.S. embassies to discuss the Y2K problem with their host country's governments whenever the opportunity presents itself. We are also supporting State through the President's Council on Year 2000 Conversion.

The Secretary and other senior officials have also been active raising awareness in the international arena. At the May 1998 European Conference of Ministers of Transport in Copenhagen, Denmark, Secretary Slater emphasized the importance of international cooperation and joint efforts to resolve Y2K problems that might adversely impact international transportation. He invited the Transport Ministers to attend the Intelligent Transportation Systems (ITS) summit hosted by the Department in July of this year, and representatives from Belgium, Portugal and Albania attended. Secretary Slater also raised the subject of Y2K in bilateral discussions like those held during the recent mission to Africa. We have also raised the Y2K issue in bilateral contacts with transportation officials from Japan and Korea, and multilaterally with the Transportation Working Group of the Asia Pacific Economic Cooperation (APEC) forum. The Department also plans to address the subject at the Western Hemisphere Ministerial in December. Finally, we are working with international associations, most notably the International Air Transport Association, the International Civil Aviation Organization (ICAO) and the International Maritime Organization.

Recently, the Administrator of the Federal Aviation Administration, introduced two resolutions for the United States at ICAO's General Assembly which were adopted. One resolution requires a Notice to Airmen by each nation to provide public assurances of the validated safety of their systems. The other resolution requires ICAO to develop and publish international Y2K assessment criteria along with status information. These data will provide FAA with a basis for any necessary future action. FAA has also established a number of international working groups. Exam-

ples include recent work with Canada and Mexico to develop plans for testing interfaces between our air traffic control systems.

The Coast Guard's Chief Information Officer attended an international conference in London to discuss Y2K issues with representatives of the shipping industry around the globe.

Also, the Coast Guard has obtained agreement from the Maritime Safety Committee of the International Maritime Organization to publish a circular encouraging member governments to bring the Y2K problem to the attention of ship owners, ship operators, ship masters, and other interested parties in the shipping industry. The circular will encourage the global shipping industry to become familiar with the Y2K problem; assess the impact on their operations; and, take action to renovate, replace or retire affected systems.

Question 2. Has your Department made specific proposals to the President or the Congress for assistance in dealing with these potential foreign source Y2K problems? If so, what are they?

The Department has not made specific proposals to the President or the Congress for assistance in dealing with potential foreign source Y2K problems. The Department did include a revised Y2K cost estimate in the President's proposed fiscal year 1999 contingent emergency funding to support, among other things, increased international Y2K outreach efforts.

Question 3. Mr. Secretary, inter-modal transportation is the norm for both passengers and freight in the U.S. To what extent and by what means is your department directing and/or coordinating these Y2K efforts to ensure gaps do not exist between various operating segments?

Answer. To date, our outreach efforts have been conducted largely by our individual operating administrations. To ensure a more integrated approach to outreach, the Department recently established an Outreach Action Team (OAT). This team of representatives from across the Department will:

- improve communications within the Department, within the transportation sector and with other sectors and the public;
- better coordinate and focus outreach efforts with the transportation sector and across other sectors; and
- address regulatory, legal and enforcement issues.

The OAT is using the Transportation Sector Outreach Plan as a baseline. This plan was developed under the auspices of the President's Council on Year 2000 Conversion and identifies outreach plans across all segments of the transportation sector. Through the Transportation Sector Working Group of the Conversion Council and the OAT, we will continue to update and revise the plan to ensure that it reflects the Y2K efforts of all Federal agencies including all DOT operating administrations; and to ensure that no component of the transportation infrastructure is overlooked.

Question 4. FAA is partnering with the Air Transport Association (ATA)—an umbrella organization in the airline industry—on Y2K issues. Which umbrella organizations/associations does DOT work with in other transportation sectors?

Answer. The U.S. Coast Guard (USCG), the Maritime Administration (MARAD), and the Saint Lawrence Seaway Development Corporation (SLSDC) are working with the International Maritime Organization (IMO), the Ship Operators Cooperative Program (SOCP), the Chamber of Shipping of America, the American Association of Port Authorities (AAPA), the American Petroleum Institute (API), the Cargo Handling Cooperative Program (CHCP), and numerous private shipping and maritime industry businesses (e.g. Sealand Corporation, Intertanko, Chevron Oil, Maersk Shipping, BP Marine, Inland Marine Underwriters Association, etc.).

The Federal Railroad Administration (FRA) is working with the Association of American Railroads, the American Public Transit Association (APTA), the American Shortline and Regional Railroad Association, the Railway Progress Institute, the Brotherhood of Locomotive Engineers, the Class I freight railroads, AMTRAK, numerous commuter, regional and shortline railroads, and suppliers of signaling, dispatching, telecommunications and computing equipment used by the rail industry.

The Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the National Highway and Traffic Safety Administration (NHTSA) are working with the American Association of State Highway and Transportation Officials (AASHTO), the Automotive Industry Action Group (AIAG), the American Public Transit Association (APTA), the Institute of Transportation Engineers (ITE), individual motor carrier and trucking companies, State Departments of Transportation, and local governments.

The Research and Special Programs Administration (RSPA) is working with representatives from the American Gas Association, the National Association of State Pipeline Representatives, the Interstate Natural Gas Association of America, the

National Association of Regulatory Pipeline Commissioners, the American Public Gas Association, and the American Petroleum Institute.

Question 5. You have previously mentioned that the Transportation Equity Act for the 21st Century (TEA21), guaranteeing \$198 billion for highway, transit, and intermodal projects, is the first opportunity for State and local governments to tap Federal funds for Y2K efforts. Have you issued any guidance to grantees so that they know how to apply for the money? Have any Y2K related applications been received to date?

Answer. The FHWA has issued guidance to its Regional and Division Administrators on the use of the Federal-aid program and has established processes which facilitate a State or local agency's ability to receive funding. Federal-aid highway funds may be used for Y2K fixes either as direct costs through an existing Federal-aid project or as an indirect cost built into the State's indirect cost rate. The guidance addressed eligibility, environmental issues, project programming and procurement. Regional and Division Administrators have been strongly encouraged to quickly convey this information to their State and local partners, and to impress upon them the urgency of their need to act.

In addition, the Department recommended and the Congress has passed, legislation to allow fiscal year 1999 Aviation Insurance Program (AIP) funds to be used by commercial service airports to assess the Y2K compliance of facilities, technology systems or equipment directly related to airport activities. Once assessment is completed, any subsequent work to attain Y2K compliance will be eligible under normal AIP eligibility rules.

Question 6. In DOT's August quarterly OMB Y2K report, remediation cost estimates increased by \$31M to \$213M. These increases were primarily due to refinement and validation of remediation cost estimates. We understand the cost could increase further. How do you plan to fund these additional increases? What is the impact if additional Y2K funding is not available?

Answer. The Department included a revised cost estimate in the President's proposed contingent emergency funding to address fiscal year 1999 Y2K work. If the additional funding is not made available, the Operating Administrations will have to support Y2K efforts by reducing other programs.

Question 7. State and local governments are responsible for maintaining surface transportation and mass-transit systems. What specifically are you doing to ensure that State and local governments are actively addressing Y2K issues? Who is coordinating Y2K work among State and local governments? How ready are State and local governments? Do they have funding problems? How can State and local governments best be incentivized to actively and aggressively pursue Y2K?

Answer. The primary coordination between the Federal Government and the States is through the Federal Chief Information Officers' Council and the National Association of State Information Resource Executives (NASIRE). Through the CIO Council we are providing information about data exchanges and interfaces with State governments. This information is being shared with the States through a website.

Most of our work with State and local government is being done directly through the Department's operating administrations and through umbrella organizations. For example, FHWA and ETA are working closely with the American Association of State Highway and Transportation Organization (AASHTO) and the American Public Transit Association (APTA), respectively, to raise awareness. At the recent APTA Annual meeting Year 2000 was the subject of a panel discussion. Some State and local governments are further along in their Y2K remediation efforts than others, and some State and local governments are experiencing some of the same funding shortfalls that we have in the Federal Government. One incentive the Department has offered to State and local governments is the availability of funds provided by the Transportation Equity Act for the 21st Century (TEA21) mentioned in your previous question.

Question 8. Other Federal agencies (e.g., HHS) have told this Committee that they did not receive full cooperation when they tried to collect Y2K information from the industries they regulate. What is your experience with various transportation sectors—i.e., airline, maritime, automotive, mass-transit, and rail industries? How can Congress help?

Answer. The Department has received fairly good cooperation from operating entities in the transportation industry (airlines, transit operators, States, etc.) in sharing information about their Y2K preparedness. The issue of liability has been the prevalent reason cited by manufacturers and other private sector entities for not responding or providing incomplete information. Recent passage by the Congress of the Year 2000 Information and Readiness Disclosure Act should go a long way to-

wards encouraging industry to share useful Y2K information that could benefit a large audience.

Question 9. Mr. Secretary, could you please describe how DOT is working to develop contingency planning with the transportation industry? For example, if there were to be significant disruption in one sector or region, what methods or mechanisms would be employed to ensure that critical goods continue to move?

Answer. To date, the Department has addressed contingency planning primarily from an internal systems/exchange partners standpoint. The Federal Aviation Administration (FAA) is working with its unions to finalize a comprehensive contingency plan which will address continuity of air commerce. However, the primary emphasis of our Y2K outreach efforts with the transportation industry has been awareness of the need to factor in contingency planning as industry takes steps to avert business interruptions associated with the Y2K problem. The question of how to mitigate significant disruptions, both within and outside the transportation sector, has not been addressed to our satisfaction. We do note that the Coast Guard is taking a lead role in forming Regional Y2K Readiness Committees to assess economic and operational vulnerabilities of U.S. ports, and to prepare for them.

Also, the Department is working with the President's Council on Year 2000 Conversion to address potential Y2K failures and associated disruptions in a comprehensive manner with input from all sectors of the economy, including transportation. We will work with the Council to ensure that the continuity of commerce issues for the transportation sector are addressed and that appropriate mechanisms are in place to mitigate significant disruptions and ensure that critical goods continue to move.

PREPARED STATEMENT OF CHARLES FELD

IMPACT OF THE YEAR 2000 PROBLEM ON DELTA AND THE AIRLINE INDUSTRY

The airline industry is heavily dependent on information technology to run its daily operations. Much of the technology relied upon, such as aircraft maintenance systems, air traffic control environments, reservations and ticketing systems, have issues with date functionality when processing a year date of 2000 or beyond. Implications could range from erroneous processing to failure of the function. Delta's flight operations, flight support units and other business support units depend on internal and external computer systems and equipment that are affected by the Year 2000 issue.

Delta currently believes that completed and planned modifications and conversions of its internal systems and equipment will allow it to be Year 2000 compliant in a timely manner. There can be no assurances, however, that the Company's internal systems and equipment or those of third parties on which Delta relies will be Y2K compliant by Year 2000. Nor can assurance be made that contingency plans will mitigate the effects of any non-compliance. Contingency plans to support a continued safe operation depends greatly on the efficacy of the respective contingency plans of critical third parties, including the providers of infrastructure critical to the airline industry such as the FAA. The failure of Delta's systems or equipment or those of industry third parties could result in reduction or suspension of the flight operations or internal business operations and have a material adverse effect on the Company's business or financial statements.

Like all other airlines, Delta has a Year 2000 problem to solve. Our worldwide presence coupled with our partnerships with other carriers and travel related businesses accentuates our interdependencies. Economic viability depends heavily on the airline industry domestically and globally.

DELTA'S APPROACH FOR DEALING WITH THE PROBLEM

Achieving Y2K readiness is a top priority for Delta. Delta has implemented a four phase program to address its internal systems and equipment which includes: (1) identification; (2) assessment including prioritization; (3) remediation including renovation, replacement or upgrading, or retiring; and (4) testing. The Company is also reviewing Year 2000 readiness of third parties which provide goods or services which are essential to Delta's operations. In addition, Delta is revising its existing business interruption contingency plans to address issues specific to the Year 2000 problem.

The work is being scheduled based on business criticality of the function. Criticalities were determined on the ability to continue operations keeping safety, security, and customer services as priorities. Delta's program is supported and led by Chief Information Officer, Charlie Feld. Senior management and Board of Direc-

tors are updated monthly as to safety of flight systems and equipment, critical internal business systems, facilities, supplier readiness, and contingency planning. High critical internal business systems are on schedule with remediation expected to be completed by December 1998. All other critical systems are expected to complete testing by June 1999. Customer Service hardware will be replaced with upgraded Y2K compliant hardware beginning with airport installations in September 1998 and is expected to be completed in all Delta served airports by December 1999.

Delta has been an active proponent and participant of the ATA & IATA programs. Company representatives hold key Y2K leadership positions in these programs and spearhead Delta's efforts for industry Y2K readiness with airports, regulatory agencies, and supplier programs globally.

GENERAL PREPAREDNESS OF THE AIRLINE INDUSTRY TO MAINTAIN CONTINUOUS
UNINTERRUPTED SERVICE

During the latter part of 1997, Delta recognized the need for an organized industry effort and the necessity for the FAA to properly address Y2K issues. The Company took an aggressive leadership role to raise awareness among airlines and to ensure an organized industry effort. Delta's participation contributed to the approval of an ATA Y2K committee in December 1998, and lobbied for a parallel program for IATA, resulting in the formation of an IATA Y2K Executive Steering Committee in April. Company representatives hold key leadership positions in these programs, i.e., membership in the ATA Y2K Committee, membership in the IATA Y2K Executive Steering Committee, and chairperson of the ATA Airport Y2K subcommittee.

The U.S. aviation industry appears to be leading the rest of the world in its efforts to address Y2K issues. With the information shared thus far, we have confidence in the FAA's efforts to become compliant and are currently comfortable with where they are with their schedule. Within the United States, airlines, airports, regulatory agencies and suppliers have primarily focused on their own businesses. With progress being made on internal systems and equipment and more active participation in industry efforts, a better understanding is evolving as to the critical interdependence of airlines, airports, regulatory agencies and suppliers. This emerging focus on an integrated view of the airline industry Y2K problem will require the different entities to work together to solve the problem. Progress with airports is being made, but Delta is concerned as to the number of airports assessed thus far that ATA data indicate as having no plan or are more than three months behind schedule in their plan. Needless to say, there is much work to be done for the air transportation system to become Y2K compliant.

RESPONSES OF CHARLES FELD TO QUESTIONS SUBMITTED BY
CHAIRMAN BENNETT

Question 1. Are you aware of any overarching assessment of the overall Y2K preparedness of the airlines? If not, can you speculate on the overall preparedness?

Answer. Yes. ATA and IATA are working with its member airlines regarding common external dependencies of the air transport industry, which includes airports, industry suppliers and regulatory agencies.

Question 2. Delta Air Lines has been eloquent in their testimony of the need for governmental actions to head off potential Y2K deficiencies for the air transport industry. Do you or your industry representatives have specific requests that you would propose for the several areas of concern? If so, have you submitted these requests to the Administration or specific Committees of the Congress?

Answer. Yes and yes.

Question 3. Does Delta have specific concerns related to operation in other countries? Are you satisfied that these concerns are being addressed? If not, what more should be done, and by whom?

Answer. Delta has been concerned with the readiness of the many air traffic systems internationally. Through our efforts along with United Airlines and Northwest Airlines, we are satisfied with IATA's plan for assessment of such systems. Delta, as well as other IATA member airlines, should continue to play an active role in IATA's Y2K program, monitoring progress to achieve acceptable results.

Question 4. What assumptions does Delta's Y2K planning make in regard to electric power and telecommunications services. Are there any backup plans for them in Delta's Contingency Planning?

Answer. Electric power and telecommunication services are highly critical and are included in our top supplier list. ATA is assessing those companies common among airlines. Additionally, questions regarding the preparedness of these companies are

being raised through our efforts with facilities readiness. We have encouraged and are aware The Edison Electric Institute is leading industry efforts with utility companies in a similar manner to ATA's lead with the air transport industry. Through an active role with the Atlanta Y2K Users Group (community outreach with the Chamber of Commerce), we will be sponsoring a public utilities Y2K session for local companies. Yes, we will have back up plans for key strategic buildings in case of electric power failures, but sustaining operations will be difficult. Even with contingency planning, there is not much we can do to avoid disruption in operations if these suppliers fail.

Question 5. Have you received sufficient Y2K responses from aircraft and airport equipment manufacturers to identify Y2K effects on aircraft and airport systems?

Answer. Regarding aircraft, yes. We have determined there are no safety-of-flight issues with aircraft and onboard flight support systems. We are currently in the remediation phase for other onboard flight support systems which maximize operational efficiency, but are not essential to the safe operation of flights.

Regarding airport equipment manufacturers, yes in regards to the equipment we own as an airline. For the equipment and systems owned and assessed by airport authorities, we do not have this level of detail. Safe Harbor legislation can assist with the sharing of this information.

Question 6. For Y2K non-compliant versions of the inertial navigation system, what do you intend to do to remedy reported problems: fix, replace, or propose alternative procedures? If alternative procedures are considered, have these procedures been developed and submitted to FAA?

Answer. All of our inertial navigation systems are Y2K ready.

PREPARED STATEMENT OF DEBORAH A. FREEDMAN

INTRODUCTION

Good morning Chairman Bennett, Vice Chairman Dodd, and distinguished members of the Special Committee on the Year 2000 Technology Problem. On behalf of The SABRE Group, a world leader in electronic travel distribution and information technology solutions, I appreciate the opportunity to address the issues facing the airline industry related to the Year 2000 technology problem.

My name is Deborah Freedman and I am Senior Vice President—Application Development for the SABRE Technology Solutions division of The SABRE Group. In that capacity, I am responsible for coordinating Year 2000 programs both for The SABRE Group and for the company's airline customers, which include, among others, American Airlines, US Airways and Canadian Airlines.

While The SABRE Group is a diversified information technology company, we are perhaps best known for our groundbreaking computer reservations system, or CRS, through which travel agents and others electronically book \$66 billion of travel per year, including about one-third of air travel worldwide. Readying the SABRE CRS, the world's largest privately owned computer network, for Year 2000 has been an enormous part of our company's effort. However, our responsibilities in this area also extend to many other participants in the transportation industry.

Until 1996, The SABRE Group was the information technology operating division of American Airlines. In October of that year, our company had an initial public stock offering. Today, almost 20 percent of SABRE is traded on the New York Stock Exchange, with the remainder owned by AMR, American's parent company. Although our ties to American Airlines, our largest customer, are thus quite strong, we are rapidly expanding our business relationships with other air carriers and travel providers, through a growing number of joint ventures and similar transactions. Our unique expertise in developing information technology solutions for the travel industry—a legacy of American's leadership in this area—has created increasing opportunities for us as a supplier of software tools and outsourcing services to airlines, hotels, railroads and others. In this capacity, we have helped our customers, particularly our airline customers, address the Year 2000 problem. At The SABRE Group, we have developed a rigorous, systematic approach to the Year 2000 problem that I am pleased to share with the Committee today.

In the remarks that follow, I will explain (i) the particular Year 2000 challenges for the airline industry, (ii) the SABRE Group's implementation plan for Year 2000 readiness, (iii) the company's current state of compliance and (iv) our current airline industry assessment.

II. YEAR 2000 CHALLENGES IN THE AIRLINE INDUSTRY

As the Committee is now acutely aware, the Year 2000 problem surfaces when computer systems fail to recognize and process date/time information across the turn of the century and beyond. The airline industry depends heavily on computer automation for advance travel bookings and complex planning functions. Because of their early booking and planning needs, many airlines require systems that can process Year 2000 dates during the first quarter of 1999. This challenge is made even more complex for the airline industry because of the high level of automation and the operational reliance on date/time scheduling. Additionally, because of the elaborate interdependencies of the airline industry, individual companies cannot realistically operate in isolation from other industry participants. Indeed, the overall success of the industry will largely be determined by how well industry participants ensure the overall flow of information not only through their own systems, but also through others.

Airlines depend on computer systems for almost all aspects of their operations including flight planning, crew scheduling, capacity planning, pricing, ticketing, and billing. The day to day operations of a major air carrier require hundreds of individual systems to work in concert so that the carrier may deliver quality service to its customers. The platforms for these systems vary from large mainframes handling millions of transactions involving flight operations and reservations, to simple personal computers handling staff planning for small airports with just a few gates.

A telling, visible example of how a single system failure could directly affect the flying public is "electronic ticketing," a technology only introduced over the past three years, but which is quickly becoming an industry standard. Flying "ticketless" has added a great deal of flexibility and convenience for a growing number of airline passengers. Ticketless passengers carry no paper tickets; they merely verify their identity and receive their boarding passes. A failure of the electronic ticketing system would make it impossible to retrieve the ticketing information for those without paper tickets. The traveler in most cases would have limited information to present to the agent to prove that he was a paying passenger. Regardless of the Year 2000 readiness of all other systems, if airlines were unable to recognize passengers ticketed for each flight, operations would dissolve into chaos. The challenge for air carriers is to ensure Year 2000 readiness of all critical systems so they can continue to provide uninterrupted service to the traveling public.

Along with ensuring the Year 2000 readiness of carriers' individual systems, the airline industry must validate the interoperability of the systems throughout the industry network. Airlines regularly trade passengers with each other as they make their way from point to point on the globe, and the smooth transition of those passengers depends on the electronic transfer of data between carriers. Consumers have come to depend on one stop shopping with their travel agents or their favorite Internet sites for air travel and other reservations through a seamless presentation of data collected from varying sources. The systems providing the data as well as the communications lines carrying the data must be Year 2000 ready in order for the industry to continue operating efficiently.

III. YEAR 2000 READINESS—THE SABRE GROUP'S APPROACH

Individual corporations in the airline industry must undertake aggressive programs to guarantee their Year 2000 readiness prior to experiencing time/date related failures. The following describes The SABRE Group's recommended approach to program implementation.

Comprehensive Year 2000 programs begin with a complete inventory and assessment. During this phase, the portfolio of systems, hardware and software, third party products, and infrastructure components are identified. The inventory is classified by taking into account "the time horizon to failure" of the systems, the impact of time/date to the systems processing, the consequences of failure on the systems, business criticality and system interdependencies. At the completion of this phase, and based on these classifications, a master implementation plan is developed.

Within the implementation plan, more detailed project plans outline the resources and effort required for analysis, design, remediation, and testing. These detailed plans roll up to the high-level implementation plan to ensure that any slippage in one project reflects the impact to downstream systems.

After the detailed plans for each system are completed, remediation and testing of the relevant infected components begin along with the testing of systems believed to be compliant. Comprehensive testing includes three cycles. In the first cycle, an initial baseline test captures the exact functionality and date processing of the system as it currently operates. The second testing cycle is completed after remediation modifications are completed, and the results are measured against the baseline to

ensure the system processes correctly in the current date. The third cycle of testing involves future date testing, which measures system processing during the turn of the century into the Year 2000. The tests include standard date testing, measured against the baseline results, along with other critical Year 2000 dates such as leap year 2000.

The final step of the Year 2000 process is a comprehensive project completion review. The review focuses attention on the level of analysis, validation of the component level inventory, completeness of the documentation, and validation of the tests performed and the resultant outcomes.

IV. THE SABRE GROUP'S YEAR 2000 READINESS

The SABRE Group has made Year 2000 readiness a major corporate priority since 1995. The company's Year 2000 project has the goal of ensuring that hardware and software systems operated or licensed in its business, including systems provided to our travel agency subscribers and technology outsourcing customers, including airlines, are designed to operate and properly manage dates beyond 1999.

Dedicated to providing the world's most technologically advanced and most reliable travel and transportation management systems, The SABRE Group has invested significant financial and human resources to ensure our Year 2000 readiness. Early planning, careful correction and thorough testing are keys to successfully managing a Year 2000 program. The SABRE Group's vast Year 2000 project involves checking more than 200 million lines of software code, confirming proper system interfaces with more than 600 hundred suppliers, and providing new software for in excess of 40,000 travel agencies. At peak, The SABRE Group applied the equivalent of more than 700 full-time employees to fixing the Year 2000 problem, and to date, the company has expended more than one million labor hours on the project.

The SABRE Group utilizes a methodology focusing on detailed system analysis and complete, repeated testing of all systems. A master implementation plan takes system interdependencies into account to prioritize and schedule system completion across the program. This analysis determines the amount of testing and type of remediation each system requires. The tests involve detailed examinations of the systems in both the current date and other dates through the turn of the century and beyond.

As a result of this carefully executed implementation plan, The SABRE Group is pleased to report that the majority of its core systems are either completed or are in the final testing phases of the Year 2000 project:

- The core SABRE computer reservations system is currently Year 2000 ready.
- The core functions of The SABRE Group's other real-time computer systems, including flight operating systems used by airlines to check-in passengers, determine aircraft weight and balance, plan routes and process bags, among other things, are Year 2000 ready. Only testing of minor subsystems remains to be completed.
- Year 2000 testing of other software systems operated by The SABRE Group is substantially completed and dozens of systems are currently being used to process dates beyond 1999.
- In May 1998, The SABRE Group began installing Year 2000 ready software and hardware at travel agency customer locations around the world. This effort is expected to be completed by the first quarter of 1999.
- Substantially all of the other software marketed by the SABRE Group to customers in the airline, hotel, trucking, rail and other industries is expected to be Year 2000 ready in the second quarter of 1999. More than 70 percent of these applications are to be completed by the end of 1998.
- 75 percent of the hardware testing is complete to date with the remaining planned to be complete by the end of the year. Much of this testing was accomplished by first testing at the vendor site on identical hardware, and then testing the devices within the SABRE data center. When the process began two years ago, 25 percent of the devices originally tested failed the SABRE test scripts.

With the vast majority of system level testing and validation completed, the focus of The SABRE Group has now turned to business continuity planning and industry component testing. Business continuity planning includes coverage requirements for key dates, such as the rollover of the century and "day in the life" testing, which simulates business operations in the next century. It also involves contingency planning to determine how manual processes could be used to assist with day to day operations in a Year 2000 failure. Planning now for the unexpected failure may enable the business to continue operations in the event that a failure comes to fru-

ition. While failures may cause business operations to experience a degradation of productivity, we are working to prevent the worst case scenario—shutting down operations.

Industry component testing is the validation of the data feeds and interfaces each company receives from other members of the industry, suppliers, and the government. Testing of industry components validates the interoperability of systems within the travel and transportation network. As an example, The SABRE Group's systems mentioned above interface with 600 external companies throughout the industry. The Year 2000 program team is aggressively analyzing every interface to determine the priority of the interface and the potential affect on the business. Efforts are currently underway to schedule Year 2000 testing with all of the companies with which we trade information. The SABRE Group's ability to schedule testing with external companies and the government will in large part be dependent on their completion schedules. The interfaces range from weather feeds to pricing data, as well as the transfer of passenger and cargo information between carriers. Timely industry component testing will in large part determine the industry's overall success.

V. AIRLINE INDUSTRY ASSESSMENT

The interrelationships among participants in the airline industry is such that individual system failures can have dramatic impacts on other members of the industry. As an example, a passenger may be booked by a travel agent on multiple air carriers within the same trip. The reservation is processed through the travel agent's CRS, and that data is then transferred to the carriers on which travel will occur. Let's assume that one of the air carriers failed to complete its Year 2000 work. As the data for the flights was processed by the travel agent the traveler could receive his itinerary clearly showing travel dates/times, flight numbers, carrier, and seat assignments. A later failure of a single carrier could leave that passenger trapped mid-way through his trip without ongoing reservations. Imagine the disappointment and inconvenience of setting out from Washington, D.C. to the Bahamas for a New Years 1999 celebration, only to find yourself stranded in a connecting city with no hotel, no car, and no way to reach your final destination.

The individual compliance efforts of industry members will need to be competed by the end of 1998 to ensure adequate testing time for the interlocking components of the industry. For those companies that are significantly behind, tough triage decisions will be required as to the systems which those companies choose to let break, when they determine full compliance is not reasonable alternative given the time and resources available. The validation of industry components is already moving to the forefront of the testing initiatives and will prove to be the final hurdle in the Year 2000 race. As time and resources continue to be at a premium, it is crucial for industry participants to dedicate appropriate personnel and system capacity to validate interoperability throughout the industry. As many companies within the industry are not yet finished with their internal Year 2000 readiness, industry component testing has not yet become a priority for those members. Over the next few months, The SABRE Group will use industry component testing as a bellwether for readiness of the industry. In our contacts to date, less than 50 percent of the companies with which we have tried to schedule testing are ready.

From an international perspective, The SABRE Group has seen a similar geographical disparity in aviation industry readiness as has been noted in other industries. In general, U.S. airlines appear to have gotten a head start on carriers from other regions of the world. Most companies are addressing the problem, have active plans for completion, and are completing the final stages of internal system testing. Europe is behind the U.S. in completion but is actively addressing the problem. Corporations in the Far East appear to have only recently focused any attention on the problem and lag the rest of the world in completion.

In general, the airline industry has taken an aggressive approach to addressing the Year 2000 challenge, but the validation of industry interoperability has only just begun. The true determination of the state of the industry will become more apparent over the next six months as corporations succeed or fail in demonstrating their readiness to those who must interoperate with them. Those who fail in this effort will be at high risk of finding fewer companies willing to continue the strategic business relationships that are the lifeblood of the airline industry.

The International Air Transport Association (IATA) and the Air Transport Association (ATA) are both engaged in significant efforts to determine the readiness of airports, travel related suppliers, and air traffic control. I will defer to other members of this panel whom I am confident will address these efforts in detail.

VI. CONCLUSION

The SABRE Group is working diligently to ensure that our customers and the traveling public can depend on our systems in the Year 2000 and beyond. The company believes, however, that the airline industry as a whole, as well as related government agencies, must also work to ensure that the world's transportation infrastructure is ready for the Year 2000.

I would like to commend the Committee for its fine work and leadership on this important policy matter and express my thanks again for allowing me to address the Year 2000 challenges for the airline industry.

RESPONSES OF DEBORAH A. FREEDMAN TO QUESTIONS SUBMITTED BY
CHAIRMAN BENNETT

During the course of normal business operations, all companies are susceptible to and face IT failures due to hardware, data, and application problems. Companies have established manual processes to work around the problems. In some instances, the work-arounds are implemented immediately when the problem is critical. Non-critical problems normally await technical resolution.

The Year 2000 problem will not generate symptoms different from ones experienced today by hardware failing or an application incorrectly calculating. The number of items that can fail simultaneously is higher than normal and as a result the amount of time to fix a larger number of problems is likely to be longer.

A successful Y2K readiness plan includes:

- completing remediation and testing work to ensure Y2K readiness;
- testing with external entities that have a significant impact on business;
- monitoring critical service providers;
- planning for contingencies should a failure occur; and,
- scheduling resources to provide coverage as a time horizon to failure (the date at which a system begins to process year 2000 data) approaches to quickly address identified problems.

Responsible players in the aviation industry are implementing this plan and giving it the highest level of priority. We face similar problems to those faced by other industries, but there are large interdependencies that create special challenges. The SABRE Group is pleased to have the opportunity to share our views with the Committee.

Question. From SABRE's unique perspective, i.e. visibility over many players in the aviation industry, what are the most serious Year 2000 problems facing the industry?

Answer. The Y2K readiness of Critical Service Providers (CSP) to the industry and the overall interoperability of these providers are the keys to success for the airline community. CSP are those organizations, from both the public and private sectors, domestic and international, that support:

- passenger handling services (reservations, ticketing);
- private sector airport services (fuel, gate handling for departures and arrivals, airplane maintenance and engineering including parts suppliers, etc.); and,
- public sector airport services (air traffic control, weather information, etc.)

Today, airline business functions include a wide range of equipment and data that are supplied by numerous organizations and the interoperability of all providers is critical for an airline to continue operations. Should any one provider incur a failure today, an airline has work around solutions or contingency plans in place.

Most passengers have experienced the implementation of work arounds or contingency plans at some time during their travels due to bad weather, service lapses or system failures. A few examples include:

- departures or arrivals delayed;
- reservations rescheduled;
- flights cancelled;
- aircraft pulled from operation and replaced;
- flight plans adjusted, flights rerouted to land at another airport, and passengers bussed to the original destination; and,
- weather data obtained from alternative sources.

Today, organizations that support the airline industry make changes to their operations, equipment and systems and work with upstream suppliers or downstream customers to ensure the changes do not impact operations. If each organization has taken appropriate steps to be Y2K ready then the steps to test interoperability would be little different from the steps taken today.

The effort needed for the airline industry to become Y2K ready is massive. A large number of CSP, from both the public and private sectors, domestic and inter-

national, are needed to keep the airlines operational. Some key problems facing the industry will occur when:

(1) A CSP fails to address the Y2K problem. The ability to identify, remediate and test the problem is too late. Another CSP would need to be found and inserted into the operation. The ability of an airline to quickly insert an alternative CSP is limited unless contingency plans were pro-actively identified.

(2) The airlines do not “dust-off” and review work around processes and contingency plans should failures occur and refresh staff on the implementation of those actions.

(3) A CSP expended the effort to become Y2K ready but does not schedule testing with external entities to ensure interoperability.

(4) A CSP does not schedule sufficient resources to provide coverage should a failure occur as the time horizon to failure approaches.

(5) The number of failures is so significant that work arounds and contingency plans are insufficient to continue operations.

Question. Your testimony describes “electronic ticketing” as an emerging technology that is being increasingly used by a growing number of airlines. Can you estimate what percentage of the passengers and airlines are using this technology? To your knowledge, are those using this technology actively engaged in contingency planning should the technology fail?

Answer. With few exceptions, domestic airlines use electronic ticketing. Large carriers in other countries have electronic ticketing functionality. The status of local or regional carriers operating in foreign countries is unknown. The use of electronic ticketing is increasing. The number of tickets that are issued as “electronic” is close to 50 percent for domestic travel. The business markets have been the largest adopters of the functionality while the leisure market is slower. Several large airlines have electronic ticketing for select international routes.

For the SABRE Computer Reservation System (CRS), if the electronic ticketing function fails, the failure will be uncovered in early February 1999 because the system begins to process year 2000 data at that time. February 1999 is ample time to identify and fix problems in the host system. Additional disruptions from hardware failures could be experienced during the century rollover.

Today, the airlines are susceptible to system failures that might prevent an airport agent from accessing a boarding list. The process to manually board electronically ticketed passengers exists today for most airlines. Contingency plans are being developed, such as printing passenger manifests two to three days in advance of the turn of the century, for flights scheduled during the first week of January.

Question. What percentage of the airline tickets is booked by travel agents? Can you estimate what percentage of the agent's systems will fail, and what the implications of such failure would be in terms of lost revenue?

Answer. Approximately 70–80 percent of all airline tickets are booked by reservations agents using one of four Computer Reservation Systems (CRS). The CRS are mainframe based applications with some front-end graphical user interfaces. Access to the host based system is very dependent on network connectivity. Disruption in the travel agency business would be the result of one of three areas failing:

(1) the PC or hardware in the travel agents location and the associated operating systems would not be Y2K ready;

(2) the network that is the connectivity between the PC and mainframe would fail; and/or,

(3) the application and host system does not operate.

The likelihood of a travel agency not being able to book travel through the CRS is small. SABRE has extensive efforts underway to ensure that the hardware and software used at travel agency sites will be Y2K ready by 1Q99, the work on the SABRE host CRS is complete, and our work with the network providers is underway. Several successful tests have been conducted between the SABRE CRS and the other three CRS.

Today, there are outages that occur and travel agencies perform work arounds until recovery is complete. All parties in the event of an outage due to Y2K would take similar actions.

As stated in my testimony \$66 billion dollars of travel transactions flow through the CRS annually. The reservation and booking curve for leisure markets begins to climb three to four months prior to day of departure and for business travel the curve climbs two to three weeks prior to day of departure. The biggest inconvenience would be for travelers who book the day before or day of travel.

Most CRS host systems begin to accept reservations for travel in the January or February 1999 time frame. If problems occur on the SABRE CRS in February 1999,

a reservation for a January 2000 flight can not be made, the problem can be corrected and travel agencies can book a few days later.

Question. Are there any safety implications should airline industry support systems, such as those provided by SABRE and its competitors, have unforeseen Y2K failures, or would it primarily result in disruptions, reduced service, and lost revenue?

Answer. The question needs to be broken down into two components. The first component is related to current day activities. The second component is related to future activities or calculations.

Failures during current day activities have no different safety implications than exist today if a system or service fails. Public and private CSP, and airlines would implement work around processes or contingency plans. A current day failure would likely result in disruptions, reduced service and/or lost revenue.

Systems that forecast future activities or perform future calculations that are not Y2K ready may have compliance and safety implications for airline industry participants who do not undertake and complete Y2K remediation and testing. For example, a number of maintenance and engineering systems calculate part replacement dates in the future. Should the calculations be erroneous then a part may not be replaced in a timely manner.

The SABRE Group supports three maintenance and engineering forecasting systems. These systems forecast dates five years in the future. The time horizon to failure started in 1995 and the remediation process began at that time. The SABRE Group Y2K remediation and testing efforts are complete on two systems. The third system was developed to be Y2K ready and was recently implemented. Formal Y2K validation testing has started.

Most other forecasting systems are related to scheduling, yield management, and pricing. Calculation errors in those systems would impact customer service and revenue.

Question. To your knowledge, is there any end-to-end testing planned for the airline industry such as being undertaken by the Securities Industry Association?

Answer. At this time The SABRE Group is not aware of any planned end-to-end testing. However, Price Waterhouse has been conducting studies for several airlines, the ATA and IATA on their Y2K initiatives and efforts worldwide. Several recommendations and suggestions are expected from the PW effort. Should one of the recommendations outline the need for end-to-end testing for the airline industry, both The SABRE Group and American Airlines would be prepared to participate.

While there is no industry coordinated initiatives, a number of major carriers are conducting individual initiatives to test their industry wide connections.

PREPARED STATEMENT OF JANE F. GARVEY

Mr. Chairman and Members of the Committee: I appreciate the opportunity to appear before you this morning to discuss the impact of the Year 2000, or "Y2K," technology problem on the aviation industry and Federal Aviation Administration (FAA) efforts to address Y2K readiness of our systems.

You have already heard this morning from Deputy Secretary of Transportation Mortimer Downey about some of the potential impacts of the change in millenium on the transportation community. Let me reassure you that the FAA is dedicated to making sure that the advent of the new millenium will not bring any compromise in aviation safety with it.

I have given my commitment to the American public, and now commit to you, their representatives, that aviation safety will not be compromised on January 1, 2000, or on any other day. In fact, addressing the Year 2000 technology problems is one of my highest priorities. In February of this year, I changed the FAA's approach to the Y2K problems. In assessing where the FAA was in solving the Y2K problems, I found that one line of business within the FAA, Air Traffic Services, had developed a successful approach that involved centralized management, with a clear plan, process, and milestones. I made that the model for the rest of the agency and created an agency-wide Year 2000 program office reporting directly to me. I asked the manager of the Air Traffic Y2K program, Ray Long, to head the new agency-wide office. Under Ray's guidance and leadership, Air Traffic Services did not miss a single Y2K deadline, and now that he's leading the FAA program office, we have closed a significant gap in the Office of Management and Budget's (OMB) Federal Y2K compliance schedule, and continue to move steadily toward our final solutions.

Our teams in the field have already assessed every system in the FAA—not just mission-critical systems that are absolutely necessary to the FAA's commitment to aviation safety, but every single system. We are now well into our renovation phase,

where we actually make modifications to the systems that need them. By the time of the next OMB quarterly report, the FAA is scheduled to complete 99 percent of all required systems.

With respect to the HOST computer system, one of our core air traffic control systems, with the help of our vendors we have developed a well-defined strategy for the successful transition of the HOST computer into the next century. The existing system is scheduled to be completely replaced by the year 2000. However, as a contingency to HOST replacement, we have already completed renovations of the HOST as of July 31, two months ahead of OMB's September 30th renovation deadline. If there is a need for the HOST to be operational in the Year 2000, we are assured that it will transition to the new millenium in a routine manner.

We have already started our next phase, validation, or testing of individual components and systems, for some systems. Validation will begin in earnest next month. In addition to our validation process that incorporates General Accounting Office (GAO) guidelines, we are planning comprehensive end-to-end tests, which test the interrelationships of systems and whether individual fixes of components will work together as a whole. These end-to-end tests will be conducted at our Technical Center in Atlantic City, which can simulate any of our Air Traffic Control Centers, and at operational facilities in Denver. These end-to-end tests will reinforce our assurance that individual system fixes will work together in an operational environment and thus ensure aviation safety.

As we continue our wider repair efforts, we are on schedule to have the majority of our systems compliant within the Department of Transportation's and OMB's deadline of March 31, 1999. All FAA systems will be fully compliant by the end of June 1999, a date that we have accelerated from our original estimate of November 1999. We continue to evaluate our schedule to accelerate it, wherever possible, to meet the deadline of March 31, 1999, which OMB has established as the date that systems government-wide will be Y2K-compliant.

We have overcome many obstacles to get where we are today, and I am very proud of the work that we have been able to accomplish thus far. Nevertheless, we recognize that we face many other challenges in the months ahead. We have strengthened our program management by teaming with an outside business partner, Pricewaterhouse Coopers, which has the expertise to support us through the management and oversight of this project. In doing so, we have been able to better focus the strengths of FAA personnel, such as extensive knowledge of the National Airspace System (NAS), and successfully leverage our technical resources. We have been able to make such significant progress because we have taken this new approach.

At this point, I'd like to turn the focus of my remarks today to our collaborative work with our industry counterparts. First, I'd like to say a few words about our plans for collaboration with our labor partners. In June, we briefed the National Air Traffic Controllers Association (NATCA), the Professional Airways Systems Specialists (PASS), and the National Association of Air Traffic Specialists (NAATS) on our Y2K efforts. We are also planning follow-up briefings and workshops with these and other labor groups to receive and incorporate their input into the FAA agency-wide contingency plan, which we expect to publish in December 1998. The contribution of our workforce is essential to completing this activity.

We have also made great strides in our partnerships with the aviation industry, both domestically and internationally. The FAA sponsored an "Industry Day" in June of this year, and we have scheduled another for late October. These Industry Days bring together key stakeholders from all sectors of the aviation industry to raise awareness and work together to solve Y2K problems that are specific to aviation safety and efficiency. Our June Industry Day included participants from the FAA, as well as representatives from airlines, airport authorities, aircraft manufacturers, the communications field, and international groups. The agenda focused on identifying Y2K issues with our industry partners, and potential solutions to those issues. Over 120 attendees from all sectors of the aviation community attended, and I think it's accurate to say that we all felt that the information and cooperation that we generated was beneficial for all of us. For our upcoming Industry Day, we are planning to invite a full range of representatives from the aviation community. Our focus on that day will be the status and progress of our industry partners, the external activities of the FAA, and the FAA's next steps towards validation testing of FAA systems.

We have formed an airport industry working group to facilitate a clear understanding of airport Y2K issues within the airport operator community, and we have developed an Internet web page for the dissemination of Y2K airport information and guidance. We have communicated with manufacturers of critical airport systems stressing the need for their products to be Y2K compliant and asking that per-

tinient information be sent to affected airports and FAA. We have developed and distributed a comprehensive airport system list to over 5,000 public airports to help them identify and correct Y2K issues, and are currently developing a letter to FAA-certificated airports outlining responsibilities for assessing and remediating Y2K problems. Finally, we have made every effort to include them in our Industry Days to make sure that their specific concerns are raised.

Moreover, our work in the international arena has been an important focus of our Y2K efforts. In April of this year, we issued a Year 2000 International Project Plan, implementing coordination with international partners. We are working closely with the International Civil Aviation Organization (ICAO) to raise awareness of Y2K issues in the international community. We have assigned a full-time FAA employee to work with ICAO in their Montreal, Canada office, to offer guidance and support in any way we can. We have also initiated informal working groups with different international entities to solve common Y2K problems. We recently completed a testing agreement with Canada and are currently coordinating an agreement with Mexico, to test data exchanges and directly interfacing air traffic control systems to ensure that travel between the U.S. and these countries continues to flow smoothly at the turn of the millenium.

In summary, Mr. Chairman, I want to say that although I am pleased with and proud of the progress that the FAA has made in solving our Y2K problems, we do recognize that Y2K presents a set of problems we have never encountered before, and that there are differing views as to how those problems should be defined and solved. We also recognize that different stakeholders will have widely ranging resources and expertise in solving Y2K problems. The FAA is committed to doing whatever we can within the scope of our authority to assist the members of the aviation industry to make a smooth transition to the new millenium.

I would also like to take a moment to thank you, Mr. Chairman and Members of the Committee, for focusing the Nation's attention on the Y2K technology problem, and helping all of us in government and industry to find the solutions. This Committee's willingness to seek ways for Congress to help reduce the risk of Y2K failures is sure to encourage everyone to work collaboratively to ensure that our transition to the new millenium is successful. The work of this Committee and our partnerships with industry are generating awareness, and generating action and results—this is an immovable deadline that we have to meet together, and with your guidance, I am sure that we will make it.

I appreciate the opportunity to address the Committee this morning, and I would be pleased to answer any questions you may have.

RESPONSES OF JANE F. GARVEY TO QUESTIONS SUBMITTED BY
CHAIRMAN BENNETT

Question 1. Ms. Administrator (FAA), you indicated in your testimony there are many interrelationships between the FAA and other segments of the airline industry. Please tell the Committee which relationships are most critical from a Y2K standpoint (other than air traffic control)? In these critical relationships, to what extent is the other participant with FAA going to be Y2K compliant (airports, airlines, etc.)? What is the basis for your assessment?

Answer. The aviation community's Y2K readiness is, to a large extent, dependent on the successful efforts of the airlines, airports, and suppliers—both domestic and international. Recognizing this, the FAA continues to work with these groups to promote and accelerate the industry's Y2K readiness. A snapshot of their progress is provided below:

AIRLINES

As reported by the Air Transport Association (ATA), all U.S. airlines have Y2K programs in place and plan to be Y2K ready no later than the second quarter of 1999.

—As of July 1, 1998, inspectors advise air carriers, air operators, and air agencies of concerns associated with Y2K.

—FAA is requiring that all air carriers, air operators, and air agencies provide a letter by September 30, 1998, stating that they have developed and implemented a plan to evaluate their flight and maintenance activities as they relate to Y2K. By January 4, 1999, these companies must also send a letter stating that the company and its outsource contractors will be able to show regulatory compliance with operations and maintenance requirements after January 1, 2000. If the FAA does not receive these letters or these letters indicate that the

company will not be Y2K compliant, we will contact the carrier directly to obtain the requested information.

- Y2K compliance is indirectly part of our inspection process, through surveillance of required regulatory items. We anticipate that additional Y2K surveillance activities will be added to our routine surveillance activities.

AIRPORTS

Many airports are just now realizing how much work must be done to become Y2K ready and are responding appropriately by stepping up their efforts in identifying and addressing potential problem areas, including fuel supply.

- ATA has devoted considerable resources to assessing airport Y2K status and monitoring efforts to fix problems in airport systems. Part of an ATA special fund of \$15 million has been used to employ a consultant to:
 - conduct on-site assessments of approximately 150 commercial service airports,
 - compile a list of airport systems that may use computers or have embedded chips (which the FAA has used in developing its list of systems),
 - contact manufacturers of airport equipment for information on Y2K compliance, and
 - maintain a large database of the status of individual systems at each airport included in their survey.

In these airport outreach activities, the FAA has learned that some airports, particularly smaller airports, are having difficulty with Y2K compliance because they lack the resources to hire the necessary personnel with the unique expertise to conduct assessments of their existing airport facilities, technology systems or equipment.

Although the FAA does not have authority to regulate the terminal and landside parts of the airport that do not involve safety, the agency is concerned about the airports' ability to move passengers through without delays. Thus, the FAA has proposed a special one-year expansion of Airport Improvement Program (AIP) eligibility to permit airports to use these funds to assess all airport systems that are AIP eligible, and those systems that would not be typically eligible, such as parking lots, gates, and baggage systems, if they are owned by airport operators. Only entitlement and state apportionment funds can be used, and are limited to one year: FY 1999. The expanded eligibility of these funds apply only to assessment of the Y2K problem, not the costs associated with fixing the systems, unless they are AIP eligible.

- The airlines through ATA and FAA are working together with airports in order to enable a comprehensive approach to Y2K readiness without duplication of effort.
- In July 1998, FAA sent letters to manufacturers of critical airfield systems, asking that information be sent to the airport and the FAA on the Y2K compliance status of their products.
- FAA has developed an Airports Y2K web site to act as a focal point for Y2K airport information and disseminate guidance.
- To determine the status of Y2K compliance/Y2K contingency plans at Part 139 airports (airports that are certificated by the FAA), FAA plans the following action:
 - The FAA established an FAA/Industry Y2K Airfield Working Group, (FAA, ATA, ACI-NA, AAAE, RAA, NBAA, NASAO, and the Airport Consultants Council), which has met regularly since June and last met on August 11 at ATA to exchange information and recommendations on action to address Y2K issues at airports, and to avoid duplication of effort.
 - One product of this effort is a list, developed from information collected by ATA and ACI-NA, of all the systems at an airport that are likely to use a computer processor of some kind. In July 1998, the FAA sent a letter to more than 5000 public airport operators emphasizing the importance of the Y2K issue and enclosing a copy of this list to help them identify and correct Y2K issues.
- FAA has established a national team with representatives in each region to monitor each airport operator's progress in determining Y2K compatibility for all Part 139 systems indicated in a list provided to approximately 600 airports. Team members will accomplish this through site visits, phone calls, and correspondence. Documentation will be requested.
- Internationally, we do know directly about the Y2K status of some—but not all—foreign air traffic control and airports to which US carriers fly and accept information about the progress that others are making on their systems.

AVIONICS MANUFACTURERS

Major manufacturers are aware of the Y2K challenge and are well-prepared for the year 2000 date change. Smaller manufacturers are capable of switching to manual operations.

- FAA has requested all U.S. approved avionics manufacturers perform a self-assessment their products and product manufacturing tools. Responses were due in August 1998. The responses are still incoming, and are currently undergoing review. FAA is also developing criteria to add to the manufacturers' inspection process (Aircraft Certification System Evaluation Program (ACSEP)) to ask of manufacturers during an inspection. The results of the inspection and the surveys will be compared.
- If there is an inconsistency between the self-assessment and FAA inspections, and that inconsistency could have a safety impact, FAA will perform a special site visit to investigate the source of the inconsistencies and to determine the appropriate action. This visit will involve both engineering and inspection personnel. Safety will be the focus of all investigations.
- FAA has made Year 2000 compliance part of the avionics inspection process by including it as part of all ACSEP evaluations conducted before Year 2000, and has made it a part of routine surveillance by both engineers and inspectors.

SECURITY

Y2K readiness of the various security systems throughout airports will be important to the overall success of the aviation community's compliance efforts. These systems include automated access control systems, explosive detection equipment software, automated baggage control systems, and automated profiling systems.

- The FAA surveyed security systems owners to determine their Y2K status. The survey inquired about the following: automated airport access control systems, vehicle and personnel identification systems, certified explosives detection systems, trace explosives detection systems, walk through metal detectors, and X-ray screening equipment.
- With regard to automated access and vehicle and personnel identification systems, FAA performed site visits at 81 large airports. The remaining 107 airports were surveyed. Several airports have reported that they are currently system ready, and those that are not have preparations in place and are working with contractors to be ready no later than February 1999. Smaller airports without automated security systems do not, therefore, have Y2K issues.
- A Y2K compliant chip for certified explosives detection systems was successfully developed. As a result, all models of CTX, the certified explosives detection system, are scheduled to be Y2K compliant by December 31, 1998.
- Compliance of trace explosives detection systems is contained in the contract specifications. These systems are expected to be ready for the year 2000 date change.
- Walk through metal detectors are Y2K compliant as they do not require micro-processor calculations to function properly. Similarly, all X-ray screening equipment is found to be compliant.

Question 2. The flying public is probably most concerned about air traffic control since it is the most visible portion of your responsibility. What hard information do you have available now to indicate your current status in this area? What causes the GAO, your own IG, and the Air Traffic Controllers to be so skeptical about the data demonstrating your Y2K progress in air traffic control?

Answer. Within the Air Traffic Control System, which is under the Air Traffic Services (ATS) purview, there are 225 systems defined as mission critical. The ATS organization completed all renovations on September 30, 1998. The following details the ATS Year 2000 (Y2K) inventory:

—Mission Critical Systems	225
—Non-Mission Critical Systems	58
—ATS Systems Total	283
—Mission Critical Systems Requiring Renovation	68
—Mission Critical Systems Renovated by 9/30/98	68

The OIG and GAO—both of which are investigatory bodies to provide impartial information on government-funded programs—have closely monitored the FAA's progress toward Y2K readiness and have communicated their concerns. The agency,

in turn, has been very responsive by directly addressing these specific areas of concern and working out any potential problems.

Despite their skepticism, both the OIG and GAO have noted the significant and substantiated progress FAA has achieved. In a recent hearing before the House Committee on Science, Subcommittee on Technology, an OIG official credited the FAA for taking “decisive actions concerning the Host and many of its other computers” in reducing the risk of Y2K-related problems. A GAO representative also commented that the “FAA has made progress in managing its Year 2000 problem and has completed critical steps in defining which systems need to be fixed and how to fix them.”

Labor partners have also expressed skepticism, due in part to limited up-to-date information available to them and only being peripherally involved in the agency’s efforts prior to September 1998. To remedy this, the FAA has reached out to the unions in periodic meetings and has directly involved them in the development of the FAA-wide Y2K contingency plan.

Question 3. Would you please tell the Committee what type of contingency planning that you are conducting to protect the safety of the flying public in the event of Y2K lapses?

Answer. FAA has a wide range of existing contingency plans in place to deal with a multitude of problems that may occur in the air traffic control (ATC) system. Specifically, each air traffic facility has a current contingency planning document per FAA orders 1900.47A and 6030.31E, which address restoration processes within the NAS. For example, if the Host computer system fails for even a fraction of a second, there is backup for the Host. If that fails in any way, then the DARC computer system is activated as a back-up. If DARC ever falters, processing of flight data is carried out manually.

Additionally, each system has an additional contingency plan that was completed during the Assessment Phase and addresses Y2K specific issues.

Currently, the FAA Y2K Program Office also is developing a FAA-wide Contingency Plan to handle potential domestic and international Y2K-related problems. By the end of this year, the plan will encompass all of FAA’s business and air traffic systems.

FAA has been involving our unions and encourages their involvement in the development of the FAA-wide Business Continuity and Contingency Plan. On June 9, FAA briefed the National Air Traffic Controllers Association (NATCA), the Professional Airways Systems Specialists (PASS), and the National Association of Air Traffic Specialists (NAATS) on the agency’s Y2K efforts. On September 18, we initiated discussions with all labor groups to strategize our Y2K contingency planning. FAA has also scheduled a follow-up meeting with these groups on October 8–9 to collaborate on our contingency planning activity. These meetings will enable us to complete the FAA Business Continuity and Contingency Plan, the agency-wide contingency plan, by the end of the year.

Question 4. FAA has stated that it plans to complete renovation of 157 of 159 mission critical systems by 9/30/98 (three weeks). The DOT’s August quarterly report to OMB stated that FAA had completed renovation on 93 (59%) of these systems as of 7/31/98. How many of the remaining 64 renovations were completed in August? Is it reasonable to expect to complete all of the remaining renovations in the next three weeks?

Answer. FAA has 154 of 156 mission critical and 94 of 94 non-mission critical systems that were renovated by September 30, 1998. As of September 29, 1998, 141 of 156 (90 percent) mission critical systems—compared to 69 percent as of August 31, 1998—completed renovation. Of the 94 non-mission critical systems requiring repair, 87 (93 percent) have completed renovation.

These figures are being confirmed through an independent validation and verification (IV&V) process being performed by both FAA (SAIC) and the DOT OIG.

Accelerated progress is attributed to the following: active involvement of top FAA management in the effort; continued utilization by the FAA of the largest system integrators; other FAA resources working double shifts; and the application of “lessons learned” from the earlier stages of the Renovation Phase.

Question 5. FAA planned to issue both a business continuity and contingency plan for the National Airspace System and an end-to-end test plan by 8/31/98. What is the status of each plan? Does the business continuity and contingency plan include the possibility of nation-wide system failures?

Answer.

BUSINESS CONTINUITY AND CONTINGENCY PLAN

The FAA is currently developing a FAA-wide Y2K business Continuity and Contingency Plan, scheduled for publication by December 31, 1998. This plan will (1) specifically address Y2K problems from a national perspective; (2) include international issues; and (3) encompass FAA business systems.

END-TO-END TESTING

The draft of the FAA-wide end-to-end test program plan was finalized August 31, 1998. FAA is defining the functional scenarios and the detailed test cases, including interfaces that will be tested in the end-to-end test. Additionally, the FAA has already started to coordinate such tests at the FAA William J. Hughes Technical Center in Atlantic City, New Jersey with identified stakeholders. The testing is being planned at the Technical Center and designated field sites.

Question 6. Examination of data exchanges is essential to every Year 2000 program. Once data exchanges are inventoried; exchange partners must be contacted; agreements with these partners must be reached as to what corrections must be made, by whom, and on what schedule; and requisite testing must be defined and performed to ensure that the corrections do, in fact, work. In early August 1998, FAA's Y2K Program office did not have a complete inventory of its data exchanges. Additionally, it did not know if interfaces in its incomplete inventory exchanged date-related data. What has FAA done to get a better handle on data exchanges? How many of the interfaces in this inventory exchange date-related data? How many of these interfaces need repair? What percentage of the exchange partners for these interfaces needing repair have been contacted?

Answer. The FAA has completed an inventory of the interfaces of all systems currently being renovated. This inventory of 653 systems identified 375 systems containing interfaces. Of these interfaces in this inventory that exchange date-related data, 123 interfaces required repair. All exchange partners for those interfaces needing repair have been contacted.

Question 7. Certain versions of inertial navigation system (INS) have been identified by aircraft manufacturers as being Y2K non-complaint. The Y2K effect has been characterized as significant since under current pre-flight procedures the aircraft will be precluded from dispatch. What testing have FAA engineers in the Certification Office performed of the INS? Has FAA verified the industry's claim that these systems have no in-flight safety concerns?

Answer. FAA engineers have not conducted testing of the INS. Responsibility for testing is with the manufacturers. FAA continues to work with the manufacturers. To date, the agency has not discovered any in-flight safety concerns. However, the FAA continues to monitor this issue with industry partners.

Question 8. It has come to the Committee's attention that the FAA may be planning to require all airports to certify Y2K compliance by June 30, 1999. One industry insider has remarked that the criteria to be used as part of this certification, which reportedly include (1) evidence of vendor certification, (2) completion of written contingency plans, and (3) evidence of an existing test plan on file are inadequate criteria on which to judge compliance. Can you comment on any FAA plan to require such certification? If such a plan does in fact exist, can you comment on the assertion that the criteria to be used for such certification may be inadequate?

Answer. The FAA plans to monitor the Y2K compliance status of systems that airport operators may use to comply with safety requirements set forth in 14 C.F.R. Part 139. In this regard, FAA has recommended to airport operators that they adopt a target date of June 30, 1999, to certify that these Part 139 systems are Y2K ready. As an alternative, the airport operator can develop a contingency plan for meeting the Part 139 requirements that does not rely on computers or microprocessors (i.e., switching the operation of runway lights from an automated system to a manual operation).

FAA recently provided the following criteria to airport operators for making their Y2K compliance determinations:

- Manufacturer's certification that the system does not contain any computers or microprocessors.
- A written description of the testing performed to determine that the system is Y2K compliant.
- Documentation that replacement hardware or software is Y2K compliant.

These criteria mirror the criteria that the agency is using for its internal systems.

PREPARED STATEMENT OF PAUL HUNTER

SENATE Y2K COMMITTEE ANNOUNCES SURVEY RESULTS MEASURING Y2K PREPAREDNESS
OF NATION'S LARGEST TRANSPORTATION COMPANIES

WASHINGTON, DC.—At the sixth hearing of the Senate Committee on the Year 2000, members discussed the threat of the Y2K bug on U.S. transportation systems and released the results of a new survey gauging the Y2K readiness of major players in the transportation industry.

The survey results follow:

EXECUTIVE SUMMARY

The Special Committee on the Year 2000 Technology Problem recently conducted a survey of large companies and service providers in the transportation sector. Representatives were selected from major airlines, airports, railroads, maritime shippers, trucking companies, and metropolitan transit authorities. Important items learned from the survey include:

- Sixty-two percent of the respondents reported that they had not completed their Y2K assessment process. This is disturbing given only 15½ months until December 31, 1999. For reference, the Office of Management and Budget directed all Federal agencies to complete their assessments by June 1997.
- One hundred percent of the respondents reported they don't have completed contingency plans. What is even more disturbing is that just over half reported that they were not even working on contingency plans at this time.
- Ninety-four percent reported their total expected Year 2000 expenditures which at this time total over \$650 million.
- Fifty percent of the respondents reported that they anticipated being involved in litigation due to the Y2K problem.
- Ninety-four percent report they will finish their Y2K preparations on time. The committee staff feels this is overly optimistic given that most of them have not yet completed the process of fully assessing the scope of their Y2K problem.
- Six of the eight which answered the question on what percent of their assessed systems are "Mission Critical" report 70 percent or more are Mission Critical.

PURPOSE AND METHODOLOGY

The committee staff asked survey respondents for information on their automated systems used to manage and operate their respective transportation systems and utilities; these include both their computers systems and embedded systems such as process control units used in their production and distribution systems. While the survey is not statistically representative of the transportation industry at large, the inclusion of 32 of the operators and service providers ensures broad representation of the industry. Pledges of confidentiality were made to survey respondents in order to facilitate honest and candid answers to survey questions.

Other studies have concluded that smaller companies are not as advanced in their Y2K preparedness as their larger counterparts. Hence, the results presented here probably represent the best-prepared portion of the industry.

FINDINGS AND CONCLUSIONS

Out of 32 companies targeted for the survey, the committee staff received 16 responses by the evening prior to the September 10, 1998 hearing. This overall response rate of 50 percent varies within transportation modes and providers from a high of over 80 percent for railroads and trucking firms to a low of 20 percent for airports.

This survey raises the most concerns about aviation given the poor response to the survey from both airports and airlines. Given the concern that already exists about the readiness of the Air Traffic Control system, this will add to the general unease about air travel. The committee staff finds the case for the Y2K flight readiness of commercial jet-liners is convincing and planes will not literally "drop out of the sky" on Jan. 1, 2000. But if the ground-based information systems supporting overall air travel are not Y2K compliant, the system will be severely limited in its overall capacity, leading to lost revenue for the airlines, lost productivity in the economy, and significant public dissatisfaction with the air transportation system.

The transportation firms surveyed did not become aware of Y2K problems until 1995 or later. Almost all have reported establishing a Formal Y2K Office and/or project within their company.

Companies have the best handle on their main frame and client-server applications and are furthest behind on the embedded chip assessment and remediation aspects of the problem.

Reported costs varied widely across survey responses. In an attempt to penetrate this deeper, the committee learned at least part of this is due to a lack of uniformity in the way that companies are accounting for Y2K expenditures.

A little more than half the surveyed parties were worried at this time about being a party in litigation due to Y2K failures and upsets. More had concerns about the failure to deliver of business partners and providers, but some felt that they could plan for these contingencies.

Organizations were also asked what the Congress should be doing to facilitate addressing Y2K problems. By far, the most common answer (about 50 percent,) was Congress should be producing legislation that supports good faith sharing of Y2K information and limits the liability organizations are exposed to by Y2K problems, upsets, or failures. Several other actions were mentioned by more than one respondent: (1) Congress should lead in the discovery and dissemination of valid Y2K information to offset the misinformation widely disseminated today, (2) anti-trust protection is needed for companies who normally are competitors but who cooperate on Y2K programs, and (3) Congress should continually oversee the Y2K programs of Federal agencies and service providers important to all industry such as power utilities and telecommunications.

SENATE COMMITTEE ON THE YEAR 2000 TECHNOLOGY PROBLEM—TRANSPORTATION SURVEY RESULTS

Company type	Date aware	Establish formal project	Assessment complete	Percent systems mission critical	Contacted service providers/vendors	Legal or liability concerns ¹	Contingency plans complete	Contacted by creditors	Contacted by investors	Will you finish in time
1. Airline	1995	1995	No	No reply	Yes	Yes	No	Yes	Yes	Yes
2. Airline	1995	1995	No	75% IT 38% emb	Yes	Yes	No	Yes	Yes	Yes
3. Airline	1995	1996	Yes	30%	Yes	No	No	Yes	Yes	Yes
4. Airport	1996	1996	No	70%	Yes	Yes	No	No	No	Yes
5. Railroad	1995	1995	No	No reply	Yes	Yes	No	Yes	Yes	Mission critical
6. Railroad	1996	1997	No	No reply	Yes	No	No	Yes	No	Yes
7. Railroad	early 90's	No reply	Yes	No reply	Yes	No	No	Yes	Yes	Yes
8. Railroad	1994	1995	Yes	No reply	Yes	No	No	Yes	No	Yes
9. Shipping	1995	1996	Yes	100% IT Emb. ??	Yes	Yes	No	Yes	No	Yes
10. Shipping	1996	1996	Yes	85%	Yes	Yes	No	No	No	Yes
11. Transit Authority	1995	1995	No	75%	Yes	Yes	No	Yes	Yes	Yes
12. Trucking	1995	1995	70%	Unknown	Yes	No	No	Yes	Yes	Yes
13. Trucking	1995	1995	No	No reply	Yes	Yes	No	No reply	No	Yes
14. Trucking	1995	1995	Yes	N/A	Yes	Yes	No	Yes	No	Yes
15. Trucking	1994	No reply	No	75%	Yes	No	No	No	No	Yes
16. Trucking	1996	No reply	No	30%	Yes	No	No	No	No	Yes

¹ Respondents were asked about potential Y2K legal exposure caused by vendor / supplier failure. Some respondents answered in general about overall legal exposure.

Notes: 1. The 15 companies that reported cost expect to spend over \$650 million collectively on Year 2000 problems.

2. While no company had completed contingency plans, 9 have begun such planning.

Source: The Committee staff.

PREPARED STATEMENT OF SENATOR JON KYL

The Year 2000 technology problem continues to make its presence felt in all of our Nation's critical infrastructures and transportation is no exception. The transporting of goods across the complex landscape of the United States has never been an easy challenge. However, integrating information technology and embedded systems greatly increased the efficiency, reliability and robustness of the transportation infrastructure. During the past decades we have increasingly moved to just-in-time delivery and consequently, many sectors of the economy now rely on the daily uninterrupted flow of goods. The time sensitivity of today's business environment increases the criticality of our vast transportation infrastructure. However, shipping, rail, trucking, and air all face serious challenges from potential Y2K problems. A significant breakdown in the movement of food, fuel, medical supplies or parts for factories may have an immediate and far reaching impact on a large number of Americans.

From a policy perspective it is important that we consider carefully the contingency planning that may be necessary to mitigate a Y2K disruption in the different transportation sectors. We need to carefully investigate of how a potential failure in a key sector like shipping, rail or trucking could affect the flow of critical goods. For example, what impact would a disruption in the trucking industry mean for the movement of goods such as medical supplies and food? How would we—Industry and Government—resolve such problems? What types of contingency plans would enable us to prioritize the movement of critical goods and energy? How would the private sector interface with the government to resolve an unexpected and troublesome Y2K disruption? How would the different sectors of the transportation industry coordinate problems among themselves? We must endeavor to ensure that critical goods such as energy, medical supplies, and food would receive the necessary priority.

The Department of Transportation is the lead Agency for transportation working group of the President's Council on Y2K Conversion and has the responsibility for reaching out to the Industry. I look forward to hearing about the Department's efforts to raise awareness, prompt the flow of information and stimulate contingency planning within the transportation industry.

The flow of technical information is critical to the timely resolution of Y2K problems. The complexity of the supply chain forces companies to reach out and request the Y2K readiness of their individual business partners. However, the current legal atmosphere hindering the free exchange of Y2K-related information.

As a member of both the Y2K Committee and the Judiciary Committee, the Chairman has asked me to carefully examine "The Year 2000 Information Disclosure Act" (S.2392) as it was introduced and make sure that it meets the needs of our nation's critical infrastructures such as the Transportation Industry. During the August recess, the staff of the Y2K Committee and the Judiciary Committee held numerous joint briefings to investigate the problems and the existing legal impediments to sharing Y2K information. In addition, I wrote to numerous industry association and organizations for comment. We hope to be able to provide an update on the progress of this legislation in the next few days.

It is my hope that the increased flow of technical information, Y2K readiness disclosures and realistic contingency planning will enable the transportation infrastructure to keep moving in the Year 2000 and beyond.

PREPARED STATEMENT OF CHRISTOPHER B. LOFGREN

This Statement is being presented in response to the request for testimony by the United States Senate's Special Committee on the Year 2000 Technology Problem, and follows the requested structure contained in correspondence from Senator Robert F. Bennett, Committee Chairman, dated September 1, 1998.

SCHNEIDER NATIONAL, INC. BACKGROUND

Schneider National, Inc. and its subsidiaries constitute the largest truckload motor carrier in North America, if not the world. Schneider National's motor carrier services include van, bulk, and specialized. Schneider National is also one of the largest providers of outsourced logistics services in North America and Europe. Schneider National is a privately owned company headquartered in Green Bay, WI, employs approximately 20,000 associates, and had revenues in excess of \$2.7 billion in 1997.

Schneider National's tractors and trailers are distinctive for their orange color, and we proudly refer to the company as "The Orange, On-Time Machine." Schneider

National serves over two-thirds of the Nation's "Fortune 500" companies, has literally thousands of customers, and has long been a leader in the use of advanced technology to bring differentiable value to those customers. In particular, Schneider National was the first carrier to employ satellite communications with each of its over 12,000 tractors, and maintains and continues to develop a code base of over 14 million lines of proprietary software that constitute its copyrighted SOURCE and SUMIT systems operating the business today.

Schneider National is part of the \$420 billion freight transportation industry. The trucking industry carries approximately 60 percent of domestic tonnage. In addition, 77 percent of all communities in the United States depend solely on trucks to deliver goods. To further illustrate the significance, in 1996, over 9 million people were employed throughout the economy in jobs related to trucking. As part of the total supply chain, the trucking industry plays a large and ever-expanding role.

IMPACT OF THE YEAR 2000 PROBLEM ON SCHNEIDER NATIONAL, INC.

Schneider National's goal is to become Year 2000 compliant in every way possible in order to continue its service to customers in an uninterrupted fashion. On-time delivery is crucial to the success of Schneider National and its customers' businesses. A late load, for whatever reason, could have a devastating effect on a manufacturing line that depends on the materials carried in that truck. Almost everything available on the market today found a home on a truck at some time. It is Schneider National's opinion that nothing should want for availability come Saturday, January 1, 2000.

To that end, Schneider National supports over 8,000 internally developed modules of source code for its operations. Of these 8,000 modules, 651 were identified to contain Y2K problems. Schneider has already spent over 25,000 hours of effort preparing for the Year 2000. This includes time spent scanning the entire code base, making the necessary repairs, and testing these applications in a simulated Y2K environment. An additional 7,000 hours will be necessary in the early part of 1999 to complete the work.

One area of focus has been Electronic Data Interchange, or EDI. Since December of 1997, EDI standards have been available that fully support a four digit year. Schneider National processes about 4,000 EDI messages daily, often to as many as 500 different trading partners. Systems using this form of electronic communication, or any other form of electronic communication, are at risk for problems due in large part to outdated systems which only support a two digit year. Schneider National, however, can now support customers that transmit the new standard with four digit years. For customers not using this latest standard, Schneider National will employ a "windowing approach" to determine the correct century. Briefly explained, "windowing" implies that if a two digit year is greater than 50, the century will be treated as starting with "19". If the two digit year is 50 or less, then the century will be treated as starting with "20". Since most data transmitted by EDI is of recent origin, this solution, although not perfect, should address the problem.

Between the hours of valuable associate time, and additional hardware and software, Schneider National expects to spend over \$5 million in its Year 2000 project. This is a substantial burden for the company to absorb, with no apparent direct additional business benefit. Nevertheless, we continue to address issues and concerns to prepare for the turn of the century, having already successfully received an order with information dating to 2007.

Of course, Schneider National is not a business run in isolation. As a result, and as is the case in our highly complex and integrated economy, Schneider National cannot go it alone. Therefore, Schneider National must rely on its vendors and suppliers, such as electricity, gas, and water, in order to ensure continuous, reliable service to its own customers. Additionally, Schneider National is working with truck and trailer manufacturers (engine control units, anti-lock brake systems, electronic dashboards, monitoring equipment, and communications equipment), EDI vendors, telephone service providers, financial institutions, facilities providers (security systems, fire suppression systems, lighting control systems, elevators), and many others, to ensure that such businesses are addressing the Year 2000 issue and are dealing with it appropriately.

Schneider National has participated, and will continue to participate, in conferences with vendors, suppliers, and customers in an effort to minimize the potential negative effects of the Y2K challenge. We at Schneider National are proud of our efforts to date and look forward to reaping the rewards of our preparedness.

GENERAL PREPAREDNESS OF THE TRUCKING INDUSTRY

The trucking industry is highly competitive in nature, from the independent operator to the multifaceted aspects which comprise a large company like Schneider National. One common element is that margins are thin and therefore the margin for error is even thinner. Yet, when it comes to the Y2K challenge, the similarities may diverge.

For example, small motor carriers might not be as affected because many, if not all, of their operations are not highly automated, instead relying on pencil and paper, telephone, facsimiles, or possibly electronic mail through an online service provider. Large carriers, on the other hand, will likely experience a significant impact of the Y2K problem, but at least may have the financial and human resources necessary to deal with the problems, provided they have *started* early. Notice the emphasis on “started”. Without that, it may be too late. Although large carriers may have the resources to address the problem, this is not to minimize the substantial financial and human resources capital necessary to deal with the problem, resources which, quite frankly, could have been employed more efficiently elsewhere were the problem not to exist.

In the estimation of Schneider National, medium sized companies may be most at risk. They may be automated enough to force a reliance on systems that are not be Y2K compliant, and in many cases have purchased software to address their technology needs. Most of these companies have only a small staff of information technology professionals to integrate the software and maintain the computing infrastructure. Given the highly competitive nature of the trucking industry, these companies may not have the additional financial and human resources necessary to replace software systems that their current vendors have not upgraded to be Y2K compliant. Schneider National believes this breakdown by size likely parallels most other industries.

For those businesses which have not started Year 2000 work, time grows short. Although there may not be enough time to fix Y2K problems for these businesses, there still may be time to identify problems and develop contingency plans to address the fallout.

THE ROLE OF CONGRESS

The Federal Government itself has a significant challenge to prepare for the Year 2000. Therefore, as the government addresses its internal efforts, we believe there are three potential avenues through which Congress can help, or at least minimize, the impact on the trucking industry.

First, the government can work to minimize its demands or business interference in 1999 with companies working aggressively to establish their Year 2000 readiness. Additional requirements and/or new initiatives which place a burden on business at this time would only serve to derail important efforts currently underway, and may potentially negate efforts already completed.

Second, Congress can help by passing legislation designed to promote more open sharing of Year 2000-related information. While the proposed “Safe Harbor” legislation may help protect those who carefully share information on Y2K solutions, or whether a product or service is Y2K-compliant, such legislation must provide American business with the freedom to aggressively pursue solutions and contingencies without fear of overzealous regulators and litigants. Unfortunately, some companies may not desire to share information out of fear of antitrust, reliability, and liability claims being visited on their already stretched budgets. Therefore, legislation which allows corporations to more openly reveal the Year 2000 status of their products, along with protection from litigation, will promote the development of appropriate solutions. Sharing information will aid the transportation industry in planning for contingencies that individual companies working alone may miss, but collectively may cure. Such “immunity” if you will, would allow the industry to focus its efforts more intently on those goods and services that suppliers, customers, and manufacturers deem critical to the continued functioning of our economy.

Third, Congress and the Federal Government can set the appropriate tone in public communications. Although urgency is in order, panic helps no one. Continuing a calm and reasoned approach through public service announcements and other communications to the public to blunt hyperbolic fear mongering will help create the climate necessary for all to concentrate on the challenge of Y2K and not on the fear of the challenge of Y2K.

CONCLUSIONS

While predictions on the dramatic effects of the new millennium range from disaster to a non-event, time will quickly tell. In that regard, it is our assessment that the trucking industry is aggressively working to mitigate the negative effects, and in general should be well positioned to continue effective operations during that crucial time. We at Schneider National, at the same time, believe that there is little opportunity for "crash" projects, and that companies without substantial efforts to date will most likely not be able to solve successfully their Y2K issues in 1999.

Ultimately, we simply cannot allow the good faith efforts by transportation providers to be subverted by those motivated by litigious and other short-sighted agendas. As has always been true, American business and the American people will seek and find solutions to the Y2K challenge in order to continue to enjoy the benefits of the most sophisticated supply chain in the world.

RESPONSES OF CHRISTOPHER B. LOFGREN TO QUESTIONS SUBMITTED BY
CHAIRMAN BENNETT

Question 1. Has Schneider National made any concrete proposals to the Administration or any committees of Congress to address the Y2K issues that they deem to be critical. Knot, has Schneider National encouraged their industry representatives to propose Y2K ameliorative measures?

Answer. Schneider National has not made any proposals to the Administration or any committee of Congress to address the Y2K issue. We have also not encouraged any of the industry representatives to propose measures.

Schneider National continues to focus on doing the best we can to be ready for whatever may occur come January 1, 2000. This includes continued testing, contact with our key suppliers, vendors and customers and contingency planning. Schneider National does not feel a strong need for legislative assistance in solving this problem.

Question 2. Can you characterize Y2K problems identified by the major truck manufacturers within either their vehicle components or their manufacturing processes?

Answer. The major truck manufacturers have not identified to Schneider National any vehicle components that might have a Year 2000 problem. Arthur Data at Navistar indicated that "These engines will not stop working on or after January 1, 2000. Similarly, it is our understanding that the heavy duty engines manufactured by Caterpillar, Cummins, and Detroit Diesel, at least since 1993, similarly have a system operation clock for controlling engine operation and will not cease functioning as a result of the Transition."

Freightliner stated, "(The plan to be Year 2000 compliant) also extends to the on-board electronic components in trucks built by Freightliner."

The account representative to Schneider National from Detroit Diesel indicated that there were no electronic components or other embedded chip issues in their engines that would cause them to fail on 1/1/2000. He did indicate that two add on features that measure the ongoing performance of the engine for the benefit of the driver and/or the owner do have problems and will soon be corrected. These, however, do not affect the continued efficient operation of the engine.

As far as their manufacturing processes, Schneider National has little first hand knowledge. The Detroit Diesel account representative indicated that he was not aware of any embedded chip, or any other Year 2000 issues in their manufacturing process.

Question 3. Would you please explain how intelligent information systems are integrated into the trucking industry and how they are being assessed for Y2K compliance?

Answer. Intelligent information systems are being integrated into the trucking industry in ever increasing ways. This includes, but is not limited to trip planning, automatic dispatch, satellite communications, log book tracking, vehicle monitoring, etc. Information constantly flows from the customer service floor to the truck and back again via satellite technology. This information becomes the source for efficient tracking, problem solving, decision making and ultimately customer satisfaction.

All of these systems can be assessed for Y2K compliance in the same fashion that any data processing application is assessed. Look at the data and confirm that four digit years are available and look at the code to ensure four digit years are being used as part of the process. If four digit years are not available, then expansion to four digits should be attempted. If it is not possible to expand to four digit years, a windowing approach must be considered. Once the solution is chosen and implemented, the system must be tested. Current date testing is performed to insure the

changes did not introduce any new defects. Date altered testing confirms that the modified system can handle dates after 12/31/1999.

Question 4. Would you please describe the process you are using for inventorying, assessing, remediating and testing both embedded systems and data exchanges, systems interfaces that are other than EC/EDI.

Answer. Schneider National does not have any manufacturing processes that depend heavily on embedded systems.

System interfaces, other than EDI have been remediated in one fashion or another to accommodate for the Year 2000. Either the data format was expanded to four digit years, or a windowing solution was employed to deduce the century. Coordination with the company supplying or receiving the information was essential to a successful implementation of either solution. The choice of a windowing solution causes less impact to the interface, since the interface layout does not need to change. Depending on the nature of the data, this may be the perfect solution for data being passed with two digit years.

Question 5. Can you describe what types of Y2K contingency plans you are developing?

Answer. Currently our contingency planning is concentrating on what can be done in the event of a power outage, a telecommunication failure, and a fuel supply failure. Our planning horizon has been limited to three days. Our assumption is that if any of these three areas fail for longer than three days, there will be other issues to deal with besides trying to run a successful business at 100 percent capacity.

The plans we are currently working on will also assume these failures will be regional in nature and not global. Again, if these failures occur on a global scale, there will be other issues to deal with besides trying to run a successful business at 100 percent capacity. These plans will also include how our satellite offices will address issues related to the rollover from 12/31/1999 to 1/1/2000 should their region be the one affected.

We have already considered Schneider associate contingencies, i.e. helping our associates prepare at home and at work for the rollover from 12/31/1999 to 1/1/2000. Addressing concerns regarding heat, lights, food and safety.

Finally, we will be preparing a plan for the worst case scenario. This plan will assume a position of protecting the business versus maintaining business as usual. This plan will address how to methodically slow down and potentially stop the business for a period of time addressing issues like asset protection and associate concerns.

Question 6. What Y2K show stoppers do you foresee for the trucking industry?

Answer. As mentioned in question 5 above, the show stoppers for the trucking industry are:

- Failure in any of the infrastructure items, electricity, natural gas, water;
- Failure in the telecommunications industry, fax, e-mail, voice;
- Failure in the reliable supply of fuel to power the trucks.

PREPARED STATEMENT OF PAIGE MILLER

Good Morning, I am Port of Seattle Commissioner Paige Miller. I am here on behalf of the citizens of King County in Washington State to explain how seriously we take the Y2K issue at Seattle-Tacoma International Airport, to share with you some of our experience, and to provide some suggestions on how Congress might help all airports deal with this crisis. I am proud of the fact that a recent Air Transportation Association review found that we appear to be ahead of many other airports in preparing for Y2K. But I am also here to express our concerns about how the airport industry will accomplish the Y2K program in the short time remaining.

The Port of Seattle is a leader in Y2K program mobilization. We started in 1993 replacing old computer programs to make sure they will handle the Y2K transition, and in 1997 we started looking at mechanical devices with "embedded" computer chips which could also fail. What we found in our inventory was that practically everything at the airport was potentially affected, and that we had better get moving fast to find the problems and get them fixed.

Examples of key systems that are high on our list are: security controls, runway lighting, baggage conveyors, fire alarms, back-up generators, 911 response systems, storm water treatment, heating, and parking garage systems. If those systems fail we would obviously have a difficult time maintaining even a minimal throughput of airplanes, passengers, and cars.

Given the magnitude of the threat, we have mobilized a Y2K team. Today there are 10 full time staffers in that office, and soon the number will be 30. That team is following the GAO recommended Y2K project plan, available on the World Wide

Web. That plan says, find and assess each system, fix or replace it, test to ensure compliance, and make contingency plans in case it all falls apart anyway. As of today we have identified 113 systems and completed initial assessment on all of them. We are just beginning the fix and test phase.

At this point, roughly a third of our systems are not compliant according to vendors, a third are compliant according to vendors, and a third are still unknown because the vendor has not given us a definitive answer or is not in business any more. Our budget for fixing known non-compliant systems and testing all systems is approximately \$10M. Fixing systems found to be non-compliant in testing could potentially cost another \$10 or \$20 million. In the worst case scenario this would represent nearly a third of our annual operating budget.

A number of factors make it difficult to solve the Y2K problem. First is the rock hard, unmovable, deadline. January 1, 2000 will be here in 477 days. And every business, every airport, every government office (from the Senate down to the dog-catcher) must meet that deadline. And that means we are all competing for the same technically specialized resources (people) at the same time to fight the same deadline. Another important factor is the liability concerns of vendors and owners, which can delay their sharing of information and developing optimum solutions together. Finally, once you fix a system you have the added effort to keep it fixed because when you fix something else it may impact the system you fixed first.

I am not here to assure you that we will complete our Y2K program on time despite our best efforts with our most capable people. We will do everything humanly possible to organize, manage, and deliver solutions for each of the 113 systems at Sea-Tac, and to have contingency plans in place for their possible failure. In some cases we are cannibalizing our own offices, pulling some of our best people away from other projects that badly need them. But the problem is worldwide and industry-wide, involving airlines, airports, and air traffic control systems. What we know about other airports is that for the most part they have started their programs later than we have, and are planning to spend fewer resources.

I will end with a few suggestions for ways Congress could help solve this crisis. First, lead by example. The time for study is past. We urgently need to produce an emergency plan for the country which prioritizes sectors of the economy, identifies key resources that need to be redirected from the least important to the most important, and pass legislation which accomplishes this. To do that, you may have to defer other urgent national issues while you devote time and resources to Y2K.

Also, consider some sort of emergency funding mechanisms to assist entities such as airports that serve the national interest to replace diverted operating and capital funds that have been depleted by Y2K. Some funds should also be used to make sure all the compliance data that we, and other airports, create as we deal with this problem is immediately available to all other airports that are trying to catch up with Y2K. That way they won't have to "re-invent the wheel."

From 9-year olds doing their homework on the net, to the counting of ballots that put us all in office * * * every day technology is becoming more and more integrated with the daily lives of Americans. That is why the Y2K problem has the potential to create so much economic, political and personal crisis. That is also why we need you to lead the country by aggressively organizing a national Y2K program, and providing critical resources and funding. If you start now you can do it * * * and the Port of Seattle stands ready to help.

RESPONSES OF PAIGE MILLER TO QUESTION SUBMITTED BY
CHAIRMAN BENNETT

Question. Ms. Miller (Sea Tac Airport), you indicate in your testimony that 2/3 of your systems are either Y2K non-compliant or have unknown compliance. In the remaining time period before Y2K, what triage or priority process have you established for resolving the most critical Y2K issues?

Answer. We have classified all systems as either:

Safety Critical
Mission Critical or
Non Critical

We have scheduled all project work on systems so that the safety critical systems will be completed first, followed by the mission critical and finally the non critical. In addition, we are working on unknown systems prior to working on known compliant systems.

Question. What type of contingency Plan are you contemplating to address those segments of the Y2K program that are not completed?

Answer. We will develop a complete readiness plan which includes specific work-arounds or replacement functions for all systems in the event their remediation either is not completed, or is completed but fails to work as planned.

Question. Would you describe the normal daily interactions that are Y2K affected between Sea Tac, your customer airlines and the Federal Aviation Administration?

Answer. All normal daily interactions between airline, air port and FAA staff which does not involve handwriting or face to face dialog are potentially Y2K impaired. For example, flight scheduling, gate scheduling, security incidents, sign changes, PA announcements, baggage system mishaps, automatic doors, fire alarms, underground trains, food services, cash handling, etc., are all potentially affected.

Question. What direct effect to you expect on passengers during the Y2K transition period?

Answer. We expect that there will be some delays and inconvenience in the first few days of the new year as manual work-arounds are put in place for any system failures. As these are resolved, the system should return to normal fairly quickly. There may be somewhat higher fares as airlines try to recover some of the costs of any system slowdowns.

Question. It is the Committee's understanding that there are funding issues that impact airport Y2K efforts which vary depending on airport ownership. Public owned airports with a primary airline hub are in the best shape Y2K funding-wise. However, those that are locally owned have funding issues resulting in Y2K efforts that are lagging behind. Thus, funding available through TEA21 is much more critical to them. How does an airport apply for Y2K funds from TEA21?

Answer. We are not familiar with TEA21—therefore I cannot respond to this question.

Question. Senior executive involvement in industry seminars and lectures on the business challenges faced by airports has been virtually non-existent. This fact becomes even more troubling in light of the results, or lack thereof, reported by the Committee Staffs Y2K transportation readiness survey. Fully 60 percent of the airports did not respond at all. Investigation by the Committee indicates that the upper-level management of the nations airports are not seriously enough engaged in the Y2K problem. Please comment on the assertion that airport executive management is not sufficiently engaged in the Y2K problem? What do you think can be done to foster greater involvement and commitment on the part of airport authority executives?

Answer. We are obviously very engaged in the Y2K problem and our program director is spending a significant amount of time sharing our methods and results with other airports. There have been a number of recent industry meetings involving airports and Y2K, and one is scheduled in Dallas on December 7th and 8th. We are working with industry association leadership to develop a high level program plan that will quickly reach out to support airports that have gotten a late start on their Y2K programs. Public visibility of the ATA and ACI efforts to date will also help.

PREPARED STATEMENT OF SCOTT SKILLMAN

I am pleased to have the opportunity to address this committee regarding the pervasive Year 2000 problem and how it affects our company and our industry. I was asked to address four topics in my statement to The United States Senate's Special Committee On The Year 2000 Technology Problem.

THE FIRST TOPIC IS: "THE IMPACT OF THE YEAR 2000 PROBLEM ON CROWLEY MARITIME CORPORATION AND THE MARITIME SHIPPING INDUSTRY IN GENERAL"

Let me give you some brief background on Crowley Maritime Corporation to give you some perspective on our company. Crowley Maritime Corporation was founded in 1892 and is primarily a family and employee-owned company engaged in marine transportation and related services. The Company has revenues of approximately \$1.2 billion and has two primary operating subsidiaries, Crowley American Transport, Inc. and Crowley Marine Services, Inc. Crowley American Transport, Inc. provides containerized liner cargo services between North America, Central America, South America and the Caribbean. Crowley American Transport, Inc. has 121 offices and port locations while serving 35 ports with 36 ships and 13 ocean going RO/RO (roll-on/roll-off) barges towed by tugboats. Crowley Marine Services, Inc. provides worldwide contract and specialized marine transportation services. Crowley Marine Services, Inc. maintains a diverse fleet of 200 tugboats and barges and additional specialized equipment, including containers, oil tankers, tank farms, tractors, heavy-lift cranes, and all-terrain vehicles.

In general, the international maritime industry has some unique issues relating to the documentation of imports and exports of cargo and associated governmental regulations for customs duties, international banking using negotiable bills of lading and the documentation of shipping manifests. This process has traditionally been very paper intensive and is required in order to move our customers' cargo into and out of each country. As with many major shipping lines, Crowley has taken great strides in being able to deliver this documentation electronically in many of the countries serviced. The industry has also made strides with EDI (electronic data interchange) with customers and other parties involved in the booking and documentation of cargo. U.S. Customs and many foreign customs organizations require data in an electronic form. There is a concern that the governmental organizations required to clear a vessel in and out of port, including, customs, immigration, naval or coast guard services and/or taxing authorities may not be able to perform their duties properly, causing bottlenecks, delays, port congestion and reduced commerce. You should be aware that many of the ports we use are not the modern highly automated facilities we see pictured in Europe or Asia, since our focus is on Latin America. We do not necessarily have the same problems as others in our industry. In the case of the Y2k problem, less technology in the operations is a plus.

Another area with Y2k issues for the U.S. maritime industry is the electronic filing of tariffs with the Federal Maritime Commission, who subsequently make the tariffs available to the public. In the event that this process is affected by the Y2k bug, we do not have a clear indication as to whether the industry will be able to modify our tariffs.

A third industry issue is the tracking of the fleet of containers, chassis and trailers and consequently our customer's cargo. Crowley has more than 65,000 containers, trailers and chassis in our fleet and it is imperative that we track the location of the equipment and its cargo anywhere in the world. Like others in the industry, Crowley has made great strides in electronically tracking this equipment and input is made on a real time basis in most of our locations worldwide. Electrical power and telecommunications problems could severely reduce our ability to provide this important function.

A final Y2k issue dealing with the international maritime trade is that many port facilities, public utilities and telephone companies are owned by the governments of the countries in question. We as individual consumers do not feel we have adequate leverage with these organizations, but they are very essential to our ability to conduct business in an efficient manner in each of the countries in our service areas.

As it relates to Crowley Maritime Corporation, and we assume with other shipping lines, we have the usual Y2k issues with our computer applications, computer equipment and the software we purchased, leased or licensed from third parties. In addition, we have issues with our voice and data communications equipment and the telecommunications industry both domestic and foreign, including satellite telecommunications.

The operating equipment on our vessels contains some Y2k issues with so called "embedded chips" and their associated programming. At this time, we have determined that there are issues with the navigation and communications equipment on some of our vessels. We are still awaiting information from the manufacturers of our engineering monitoring systems and, in the case of several vessels, some components in the steering system. Navigation systems on our vessels heavily rely on the Global Positioning Satellite system and we are still obtaining feedback from the manufacturers of our equipment as to whether it is or is not Y2k compliant. There is a date rollover issue for the Global Positioning Satellite system which will occur on August 21, 1999. It should be noted that many of our ships are chartered (leased) from third parties, who also operate the vessels for us. In these cases we are obtaining Y2k warranties in the charter (lease) agreements if we expect to still be using the vessel at the end of the century. Presently there is no certification process to verify if any ships in the world-wide fleet are Y2k compliant.

As it relates to the operating equipment on terminal facilities, we checked our scales, cranes, refrigeration equipment, forklifts and other yard equipment. We have not found significant Y2k issues with the equipment. We do not own container cranes, however, but we understand that some of these cranes could be affected by embedded chip issues. The more modern and automated a terminal is, the greater its potential for Y2k issues. We use third-party operated terminal facilities in the United States and in 40 countries in Latin America and the Caribbean and we are checking with all of these parties as to their preparedness for the Year 2000.

Finally, we are investigating critical business partners we have in the United States and internationally. These include intermodal transportation providers, public utilities, fuel and lubricant distributors and refiners, banks, telecommunications providers, various governmental agencies, third-party general agents and customers.

THE SECOND TOPIC IS: A BRIEF DESCRIPTION OF CROWLEY MARITIME CORPORATION'S
APPROACH FOR DEALING WITH THE PROBLEM

Recognizing the potential impact of the Y2K problem, Crowley's Board of Directors and Executive Management Team established a world-wide company project. This project is headed by an executive steering committee composed of the Chairman and CEO and other senior officers of the Corporation. The project executive sponsor is the Senior Vice President and Chief Information Officer, which is myself. The steering committee is updated regularly and the Board of Directors is updated at each meeting. The project director, team managers and team leaders represent senior management from all critical operational and administrative functions within Crowley. The core project team is composed of more than 100 senior personnel selected for their expertise and knowledge of their particular areas and who will be devoting some or all of their time to deal with the Y2K problem until it is resolved. Our information technology, land operations, marine operations, freight services, international operations, purchasing, administration, finance and legal departments all around the globe are all working as a part of this team to resolve our Y2K issues. Crowley also has engaged expert consultants to advise and assist in this massive program and may engage more such experts as needed. Crowley has committed the staffing and financial resources necessary to ensure that the project will be completed within the remaining time frame. It is important to note that the success of our program to date is the result of the Company's realization that this is a business continuation issue and not an information technology department issue.

For almost 2 years before the start of the full Y2K project team, the Company was working to identify and correct any Y2K problems with its computer code and is continuing those efforts. In order to correct its existing code, Crowley, like many other businesses, has chosen to use an approach known as "windowing." In addition, the Company is in the process of replacing some older applications with new, compliant code. We have already completed our remediation work on mainframe applications and are currently in the process of testing the software, a process that will be completed in the first quarter 1999. We will complete the PC applications and new mainframe applications in early 1999.

Extensive inventories were compiled of mission critical devices containing embedded computer chips and software in our office facilities, operating facilities, operating equipment and vessels world-wide. We are now in the process of contacting distributors and manufacturers for all of these devices to determine the Year 2000 compliance of each piece of equipment. We are also taking action to correct the problems we are currently aware of. Based on the results of this process, we will take the necessary action to bring all items into compliance by the end of the first quarter 1999.

We have also compiled a list of our mission critical business partners around the world, including customers, suppliers, vendors, regulatory agencies and so on. We have nearly completed our initial contacts with these parties to make sure that they, too, are handling any Y2K problems they may have and that their interactions with Crowley will not impair our ability to provide uninterrupted service as we move into the next Century. We expect to monitor these situations throughout 1998 and 1999. We will adjust our operations and our contingency plans based on our business partners' Y2k readiness.

In order to control the potential for new non-Y2k compliant software and equipment to be introduced into our Company, Crowley has developed strict purchasing and contracting guidelines and contract language requiring Y2k warranties for the equipment and software we are acquiring, where appropriate. The company is also focusing on our change control process in our information services area to include all devices, connectivity and software in the process.

Although it is Crowley's intent to be fully compliant well in advance of January 1, 2000, appropriate contingency plans are being developed and in place to deal with unexpected problems that impact the operations of Crowley, including those due to non-compliance or difficulties with partners. Over the next year and one half, we will refine and expand our company-wide business recovery contingency plan. Due to the uncertainties that exist relative to the public utilities and basic public services around the world, we expect this contingency planning process to be especially burdensome.

Crowley has established a Y2k Communications Manager and assigned staff to this team in order to be responsive to our customer's inquiries regarding our readiness, a process which is resulting in an ever increasing flow of correspondence and phone calls and recently, requests for "site audits." We have established a web page dealing with our Y2K Project on our website at www.crowley.com. The web page will provide an easy way to follow the progress of Crowley's Y2K Project and to stay

abreast of Crowley Y2K developments. We are encouraging our customers to check Crowley's website for Crowley news and information.

A general feeling we have, based on our informal contacts, IT research groups and from attending maritime Y2k conferences and seminars, is that Crowley's program is as good or better than others in our industry and we are ahead of many companies in our industry in terms of our progress to date.

THE THIRD TOPIC IS: CROWLEY'S VIEW ON THE GENERAL PREPAREDNESS OF THE MARITIME SHIPPING INDUSTRY TO MAINTAIN CONTINUOUS UNINTERRUPTED SERVICE DESPITE THE CENTURY DATE CHANGE

At this time we are not aware of any maritime industry organization which has provided a forum to discuss the preparedness of the industry. As a consequence, most of our information is based on informal contacts, articles and web sites.

The U.S. Coast Guard has sponsored and actively participated in several maritime industry Y2k conferences and seminars and have shared their program extensively. The Coast Guard is currently organizing a Maritime Y2k Conference in October for the West Coast United States.

The UK P&I (Protection & Indemnity) Insurance Club and other parties recently sponsored a series of worldwide Maritime oriented Y2k seminars and they have offered free software to help setup a Year 2000 Project. In addition, they have sponsored a website (www.ship2000.com) where maritime equipment manufacturers can post the Y2k status of their products. At this point, this site has been slow to catch on with manufacturers.

For the third party operated U.S. ports we use, most port operators we spoke with have a Y2k program in place and have expressed confidence in their ability to achieve compliance, although public utility concerns are prevalent.

As it relates to our offshore locations as to port and governmental preparedness in Latin America and the Caribbean I can offer the following insight. Overall, there is enough information in the media about the problem to create awareness of the problem. Most of the suppliers we contacted have heard about the Y2k problem. Large companies, mostly multinationals, are addressing the problem. Small companies based in the Latin American countries are approaching the problem as if it were just an Information Technology issue, thus potentially impacting others. The best offshore responses are coming from banks. The public sector is a different story, however, and it represents a major concern in some countries. The main reasons are:

- Being very large and decentralized institutions, there are several departments handling pieces of functions. Therefore, one department handles the payroll software; another one the billing; another the operations, and it is very hard to coordinate their efforts as a single committee. We have received responses just for pieces of the operation, and not as a single institution.
- Efforts have started very late. Many responses indicate that they are still in the planning phase.
- From a software point of view, they have limited resources and are limited by the budget of the government. Many of the programs have been developed and modified during many years without proper documentation. A Y2K fix will take a long time.

Government institutions managing ports are not a major concern for our Latin American operation, since most of their functions are providing laborers and/or using equipment with no date function. The main problem will be reflected in billing software.

Customs in most countries is still a question. System shutdowns due to power outages, software failures or other reasons will force the use of alternate manual procedures which may cause delays but will not completely stop the operations.

A review of power and communications companies have not yielded any conclusive responses as to whether they will be able to operate in 2000. They tell us they are working on the problem and expect to be ready early or mid next year, but we have no details.

At the present time, many Government-controlled companies are in a process of privatization, which could either help or hinder the solution of the problems.

Again, I would like to emphasize that we are operating in Latin America and the Caribbean. Europe, the Middle East and Asian trade routes will have additional issues.

THE FOURTH TOPIC IS: ACTIONS CROWLEY BELIEVES THE CONGRESS OR OTHERS SHOULD TAKE TO SPEED UP YEAR 2000 REMEDIATION EFFORTS AND REDUCE THE RISKS OF YEAR 2000 FAILURES

The largest obstacle we currently see is that the legal environment relating to this issue is so unsettled that it is obstructing the ability of consumers of products with Y2k issues from obtaining clear and timely information from makers of products. We perceive the lack of specific information provided by some manufacturers as an indication of their concern regarding their potential liability should they disclose problems regarding their products. In addition, the process is made more tedious in many respects because of a desire of companies to provide a clear trail of their due diligence efforts so that they are prepared in the event of litigation.

The uncertainties regarding the availability of public utilities and telecommunications on January 1, 2000 and thereafter are significant. The acquisition of backup power generation capabilities, redundant telecommunications equipment and so on will be uneconomical for most companies. Industry information should be much more precise so we can plan for rational and cost-effective alternative approaches.

We feel it would be helpful if the maritime industry could form action teams to share data on maritime related equipment and electronic processes in order to use the leverage of the industry to ensure all equipment, and processes are properly tested and, where appropriate warranted.

We would like clear disclosure by the foreign governments as to the plans and status of the Y2k programs by all of the various agencies which could affect international trade. We should jointly address alternate ways to continue to operate, if need be.

I would like to thank the Committee for the opportunity to share this information with you and I hope that you are successful in your mission to help us all minimize the Year 2000 problem's impact on the global economy.

RESPONSES OF SCOTT SKILLMAN TO QUESTIONS SUBMITTED BY CHAIRMAN BENNETT

Question. Mr. Skillman (Crowley Maritime) your statement is very comprehensive and candid in describing Y2K problems both within your industry and with external factors. Based on the extensive Y2K analysis conducted by your company, would you please give us your best appraisal of the priority ranking of potential problem areas. e.g. ship operational, port documentation, government links both domestic and foreign,—what are the triage urgencies?

Answer. In our prioritization process, we did not force rank all Y2k issues before us, instead, we ranked each issue into one of 6 priority categories based on our ability to tolerate the existence of an issue. Each of the tens of thousands of business partners and types of equipment were individually prioritized by a knowledgeable employee, therefore it is hard to respond as to which type of issue may be of greater urgency to us than another. As a general rule, all system issues on vessels and on-shore associated with safety were given the highest priority ranking. As of today, we have 139 types of equipment which have the highest priority to us.

We do not anticipate that triage will be necessary in our project because all but a few of the most unimportant issues will be addressed and resolved during the project. In the event that triage is required on or after January 1, 2000, we will follow our same 6 priority categories in assigning resources.

Question. Based on your picture of vast interconnected shipping operation world wide that must deal with the Y2K problem, do you have any suggestions for this Committee on how we might help assist the industry in closing the Y2K gap?

Answer. The biggest uncontrollable issue we face is that there is no single organization for the worldwide marine transportation industry which can represent the industry to all of the many interdependencies we have with governmental organizations worldwide. Even if there was an organization, there is no worldwide forum in which to open discussions with all of these organizations. We are assuming that it would be very worthwhile to do contingency planning with these organizations where we would explore alternative solutions in the event of a Y2K failure of some variety. Any help the committee can give in this area would be very helpful. We do understand that the Chamber of Shipping Of America has met with Mr. John Koskinen at an International Trade Working Group meeting convened by Mr. Koskinen. Perhaps this could eventually provide the forum.

Again, the committee can assist by ensuring the passage of the so called "good Samaritan" legislation relating to the release of Y2k information about a company's products. We believe this would give us easier access to information about our equipment and service suppliers.

Question. Do you have any particular concerns with federal agencies, i.e. Customs for clearing freight or Coast Guard for ensuring safe operation in ports? Are there any specific problems this Committee should be aware of or actions it should take to help alleviate these problems?

Answer. We have a major interest in whether or not U.S. Customs, the Maritime Administration (MARAD), and the U.S. Coast Guard are Y2k prepared. So far as we have been informed, we are not aware of specific issues with these agencies at this point. However, we have concerns regarding the counterparts of these organizations in many of the foreign locations we operate in.

Question. What international concerns are confronting the maritime shipping industry? What should the U.S. Government be doing from your viewpoint to help resolve these problems?

Answer. I refer you to my comments relating to government agencies in items 2 and 3 above. In addition, the worldwide requirement to have Y2K compliance for every vessel as part of the ISM standards and registration process would also ensure that all vessels, regardless of national origin, is safe for navigation and operation in the waterways of the world.

Question. Would you please explain briefly to the Committee what would be included in a contingency plan for your company so we might have an understanding of what it entails?

Answer. We see contingency planning at multiple levels. First we see some short term operating plans for the state of our vessels, operating equipment and data processing equipment at the millennium rollover. Second, we will need specific contingency plans for each facility in the event of the loss of telecommunications or electrical power. Third, we need specific contingency plans for critical suppliers and for critical equipment who fail. Finally, we need to review our business processes associated with the flow of cargo from start to final destination to determine what alternative processes we need to have ready, in the event of unexpected failures in our processes. This contingency plan needs to consider problems occurring with data processing, telecommunications, business partners, facilities, vessels and/or major equipment.

Question. FAA and ATA have developed a partnership of which a primary objective is the compilation of common systems used at airports, both domestic and foreign, to facilitate Y2K work and information sharing. It would seem that a similar approach would be useful to the Maritime shipping industry. Are there many common systems used at maritime port authorities? If yes, who is developing the list of common systems?

Answer. In our trading sphere, the only electronic data that is regularly exchanged in many ports is the shipping manifests and customs declarations and similar paperwork required by customs. We are not aware of any other common data. Perhaps in the trade lanes to Europe or Asia, more sophisticated common systems exist. As noted in item #2 above, we believe the Chamber Of Shipping Of America is interested in participating in such a venture, if the worldwide forum could be arranged.

PREPARED STATEMENT OF SENATOR GORDON SMITH

Thank you Mr. Chairman. I appreciate your leadership in preparing for today's hearing on the transportation sector.

I would like to thank all the distinguished witnesses before us today for taking time to testify and to help us address the challenges facing the transportation industry as we enter the year 2000. I am pleased to see the range of government and industry representation before us including the Department of Transportation, the Federal Aviation Administration and representatives from the airline, rail, maritime, trucking and transit industries.

With only 478 days remaining until the first day of the new millennium, our society is finally beginning to realize that Y2K is not just a computer geek's problem, but one that will affect all of us.

It's extremely difficult to even imagine how we would survive without safe and efficient transportation. Today's diverse transportation system not only moves large masses of people to and from work, school, and leisure activities, but also is the most critical element for delivery of our nation's daily flow of goods and services.

I would like to express a few of my concerns today regarding the rail industry which is of particular concern to my state of Oregon. I'm pleased to see Union Pacific testifying here today. With operations in 23 states, it represents the largest railroad in the country. Union Pacific should be able to offer some great insight into the potential problems facing the rail industry. Having recently dealt with the dif-

ficult process of combining Union Pacific's lines with Southern Pacific's lines, it knows first hand what types of problems could be around the corner for the rest of the transportation industry.

I'm hopeful that we can learn from Union Pacific's experiences in addressing the millennium bug as well as from the experiences of the rest of you testifying before us today. If we can avoid traffic delays, loss of non-delivery of goods, disruption of flight service, and guarantee the continued safe transport of our passengers, then we can assure our nation that problems are being anticipated in order to keep the U.S. running smoothly despite the Y2K bug. My hope is that our international friends are also on track with addressing these potential problems.

Thank you Mr. Chairman. I look forward to learning more about the specific Y2K challenges our entire transportation industry is facing and the specific steps it is taking to meet them.

PREPARED STATEMENT OF ROBIN C. STEVENS

INTRODUCTION

Mr. Chairman, Members of the Committee, my name is Robin C. Stevens, Deputy Chief Financial Officer of the MTA and Chief, Year 2000 Compliance. On behalf of the New York State Metropolitan Transportation Authority (MTA), I am pleased to participate in your hearing on the Year 2000 problem.

The MTA clearly shares your concern and appreciates your interest in understanding the problem and its impact on mass transit services.

Before I speak about the Y2K issues that face the MTA and how we are dealing with them, I believe it would be helpful to set the stage by telling you a bit about our organization.

We are the largest transit service provider in the western hemisphere, serving a 14 million person, 4,000 square mile service area that covers two states, 14 counties and dozens of cities.

While we are widely recognized for operating the MTA New York City Transit (NYCT) bus and subway system, we also operate the nation's two largest commuter railroads, MTA Long Island Rail Road (LIRR) and MTA Metro North Railroad (MNR) which serve New York City's eastern and northern suburban counties, as well as two counties in Connecticut, and MTA Long Island Bus (LIB) which provides intermodal connections to the LIRR and NYCT subways.

We are also the steward of Robert Moses' legendary Triborough Bridge and Tunnel Authority, now MTA Bridges & Tunnels, operating 9 bridge and tunnel facilities whose toll revenues from 800,000 cars a day, help support the operation of our transit systems.

All told, the MTA carries over a quarter of all transit riders in the country—6 million people a day—many of whom use more than one of our modes in their daily journey.

The MTA's annual operating budget is approximately \$5.5 billion and we are currently reinvesting in our capital infrastructure at a rate of approximately \$2.2 billion a year.

Without MTA services, congested roads would paralyze the New York region; another 1.3 billion gallons of imported gas would have to find its way to our shores each year; the L. I. Expressway would need 15 more lanes to handle the additional traffic; the air would be a lot dirtier and regional commerce would grind to a halt. There is little question the national economy would suffer.

It is no wonder, then, that we are very much cognizant of the impact we could have on the region if there were unsolved Y2K issues that could affect our services.

That is why, I am happy to say to you, up front, that we are working, pursuant to an Executive Order by Governor George E. Pataki to all state agencies and authorities, to give priority to resolving Y2K issues. We have worked closely with the State's Year 2000 Project Office, sharing information and coordinating regional issues and contingency plans.

The MTA's Y2K story is in some ways more complicated and in some ways less complicated than the story of many other transit systems around the country. It is complicated by the fact that because of our size, we have many hundreds of software applications that we deal with day in and day out that support our train and bus services. We also, however, operate a transit system, that due to the eras in which some of its critical operating systems were built, has many critical operating aspects that are very manual in nature to this day and therefore not directly affected by software issues.

Nevertheless, the MTA began its comprehensive Year 2000 effort in early 1995, beginning with understanding the extent to which its mainframe computer systems would be affected by the new millennium. An all-agency effort was formalized with the establishment of interagency workgroups and agency project teams. In early 1996, we began work to define code to be remediated and also began to identify other midrange and microcomputer-based systems that needed remediation and systems that would be replaced rather than remediated. As we began to understand the size and scope of the effort, it became clear that we had to focus our efforts on systems that are critical to our business. Later in 1996, we identified other areas where we could be affected by the Y2K problem, including embedded chip technology and the continuity of goods and services we obtain from business partners/suppliers.

PROJECT ORGANIZATION, COSTS AND CONTROL

Each of our operating agencies has its own project group led by its Chief Information Officer and involving staff from both technology departments and operating departments such as signals, power, maintenance of way, subways and buses. These groups report progress to each agency President on a monthly basis. This reporting was established at the direction of the MTA. In addition, MTA Headquarters staff oversees the efforts of the agencies, provides guidance on specific matters, and prepares periodic reports to the Finance Committee of our Board of Directors on the status of the project.

To date we have spent approximately \$25M for internal information technology staff involved with remediation, consultants, and hardware and software. These costs do not include the staff time to identify embedded technology and business partners or the cost of systems that were planned to replace non-compliant systems. We expect that costs could exceed \$30M before we conclude the project.

Our program includes an audit component. MTA Audit staff has developed a program to audit the identification, assessment and testing of the various segments of the Y2K effort. The program requires agencies to provide documented evidence of compliance and test plans and results.

COMPUTER SYSTEMS

The agencies identified approximately 357 application systems used in their operations. These include systems developed by central information technology groups, other departments and packaged software. To focus our efforts and assure that critical systems were remediated as early as possible to allow recovery time for unexpected problems, we divided our efforts for computer applications into critical and non-critical categories and established a goal that work on critical systems would be complete by year-end 1998. Completion is defined as remediated, forward date tested, and operating in a current production environment.

A system is critical if it affects any of the following business activities:

- Train, bus and/or facility operations (Signal, power, communications, event recorders, fan plants)
- Staff availability (timekeeping, payroll)
- Revenue collection and reporting (fare and toll collection, receivables, payables, general ledger)
- Public safety (signage, heating/cooling, ventilation). One hundred and forty one systems have been identified as critical and all will be completed by the end of 1998 with the exception of 6 systems, which will be completed by the first quarter of 1999. Delays in these system conversions are generally due to dependencies on suppliers providing compliant software.

EMBEDDED CHIP TECHNOLOGY

Computer chip technology is ubiquitous in modern society and has found its way into many technical systems and mechanical equipment including telephone systems, communications devices, personal computers, elevators, heating, ventilation, and cooling systems, security devices, and Long Island Rail Road and Metro North Railroad train equipment, control systems and signal systems, to name a few. This may be, however, one of the few times that the age of our systems has advantaged us. With the exception of one new technology test train, the entire subway fleet and subway signal system is not affected by any embedded technology. This is quite different from the situation that newer transit systems such as the Metro in Washington, D.C., and BART in California may face. Notwithstanding the large areas with no embedded chip technology, we do have such technology in our systems.

Agency staffs involved in train, bus and facility operations have completed a survey of our critical physical plants and have identified a total of 489 devices critical

to our operations. They then determine whether there is embedded technology, if a date function exists in the device, if so, whether it is compliant or not, and whether it is active or passive (i.e. if the date function affects the operation of the device or is simply for recording). This evaluation is currently in process and to date 35 percent of the devices has been determined to have either no embedded technology or date function, or to be compliant. All critical devices are subjected to testing where possible even when the vendor has advised us that the device is compliant. In addition, all personal computers are compliant or are scheduled for replacement and local area and wide area networks are either compliant or have a passive Year 2000 problem.

Our goal for completion for identifying and resolving critical embedded chip technology, including the development of contingency plans where necessary, is the end of the first quarter of 1999.

BUSINESS PARTNERS

Agency procurement departments identified all suppliers of goods and services and reviewed them with operating departments to identify critical suppliers. A total of 1,244 suppliers have been deemed critical. Letters seeking compliance information have been sent to all critical suppliers. The initial response from critical suppliers was less than 25 percent, but second mailings and telephone contacts have brought the response rate close to 40 percent. Where firms have not responded or not responded adequately, management staff is contacting them by phone or in person to discuss compliance. MTA Headquarters staff prepared a suggested conversation script to help agencies obtain sufficient information to assess compliance.

We have established that 320 of the critical suppliers are compliant or the Y2K issue will not affect us. We expect to complete our surveys by the end of the year and develop contingency plans by the end of the first quarter of 1999.

This area is the most troublesome, since we, as many other entities, rely on so many companies for goods and services including key ones as power and telecommunications. We have no choice but to rely on the word of suppliers, however, in instances where a supplier is unique and critical to our environment, we are reviewing their Y2K efforts at a more detailed level.

CONTINGENCY PLANNING

Contingency plans are an essential part of our business. The public expects services at all times and our standard contingency plans address both isolated failures such as elevators not operating to larger system-wide failures. Agencies are reviewing these plans in the context of Y2K and will develop any supplemental plans deemed advisable.

STATE/CITY COORDINATION

As I mentioned earlier, New York State Governor George E. Pataki issued an Executive Order for all State Agencies and Authorities giving priority to the Year 2000 problem. The State has a Year 2000 Project Office, with which we have shared information and participated in forums. Only yesterday, the MTA and the New York State Office for Technology hosted a regional meeting of state, local and "quasi-governmental" agencies to discuss common regional issues and coordination. The goal was to discuss the development of NYC regional contingency plans.

A Y2K Tri-State Planning Group was formed in July of this year in an effort to enable various organizations to share their knowledge and experience in dealing with the potential problems that could affect this region. The MTA and its agencies are active participants in the group, which also includes Federal, State and City representatives, as well as participants from the private sector including power and telecommunications utilities.

We have also independently requested information from key State and City agencies about Y2K impact on critical infrastructure devices such as traffic signal controllers, which are all compliant, and have exchanged information between emergency management offices.

CONCLUSION

We believe that our extensive and comprehensive efforts to address the Year 2000 problem will ensure mass transit service through the millennium. Our early start, the involvement of senior management as well as teams of staff from the many disciplines that manage and operate the vast infrastructure necessary for mass transit, gives us confidence that we have thoroughly addressed the problem.

We will provide any additional material you may require in your effort to reduce the risks of Year 2000 failures. Thank you.

RESPONSES OF ROBIN C. STEVENS TO QUESTIONS SUBMITTED BY CHAIRMAN BENNETT

Question 1. How might one approach contingency planning for Y2K for a massive public transportation system?

Answer. We have adopted a five step process that can be used by other large public transportation systems:

—First identify the business activities that are critical to the organization and focus efforts in these areas before addressing less essential activities.

The MTA identified four critical activities—train, bus and facility operations (equipment availability, signals, power, communications, heating/cooling); staff availability (scheduling, timekeeping, payroll); revenue collection and reporting (fare and toll collection, receivables, payables, general ledger); and public safety (emergency response, signage, ventilation). We concluded that avoiding Y2K problems in these areas will enable us to continue providing safe, reliable, uninterrupted mass transit and roadway services to the public into the next millennium.

—Determine the extent to which critical business activities are dependent upon computer systems, embedded technology and goods/services from outside suppliers. As with business activities, determine which systems, technology and goods/services are critical and focus efforts on these first.

The type of contingency plan associated with systems, technology or goods/services will differ significantly. For example, the plan for systems may include introduction of manual procedures or writing of temporary computer programs. The plan for goods/services, on the other hand, may include finding alternative suppliers or, as a last choice, increasing inventories.

—Develop Y2K contingency plans in the context of existing operational contingency plans.

The nature of our business and our long history have resulted in the MTA's operating agencies already having contingency plans in key operating areas. We concluded that supplementing existing plans to reflect specific Y2K considerations will be less disruptive to our operations and more efficient to develop than creating separate plans for potential Y2K problems.

—Only develop contingency plans where the potential for disruption of essential transportation services continues to exist.

The MTA initially considered developing Y2K contingency plans for all essential services. Since development of contingency plans will require staff already engaged in Y2K preparedness efforts, we chose not to risk these efforts by diverting our limited resources to areas where we do not anticipate problems.

—Allow sufficient time to develop and implement contingency plans.

If there are business processes that deal with future dates, they may have to be Y2K-ready well in advance of 1/1/2000. A number of the computer applications supporting our capital program, for example, deal with project schedules up to five years out so we have already had to make program changes in order to handle dates properly. Some of the items we purchase, as another example, have such long lead times that orders must be placed well before the need date.

Where necessary, the MTA will have contingency plans in place by first quarter 1999 to avoid possible disruption of essential services arising from Y2K problems. Since at this point we may not have completed certification testing of some critical embedded technology or determined if each key supplier is Y2K-ready, we may develop a few plans that ultimately are not required in the interest of assuring uninterrupted service.

Question 2. To what extent have you developed specific plans with your counterparts within your region to jointly deal with Y2K problems?

Answer. We are working closely with outside governmental and public interest groups on this issue. In early September, for example, the MTA and NYS' Office for Technology jointly hosted the first meeting of state and local agencies and public authorities to discuss common regional issues and to determine the most effective way of coordinating Y2K activities. A primary goal is to develop an integrated contingency plan for the New York City area.

A new group, known as the Y2K Tri-State Network, has met three times since July as a forum in which various public and private organizations can share their knowledge and experiences in dealing with potential problems that could affect our region. The Regional Plan Association also recently launched a Y2K initiative to address the need for information sharing, contingency planning and public education. The MTA and its agencies are active participants in both groups, which include federal, state and city representatives as well as private sector participants representing power and telecommunications utilities.

We have also independently requested information from key state and city agencies about the compliance of critical infrastructure elements on which we are dependent, as well as exchanged information with various emergency management offices.

Question 3A. When did you begin your initial efforts to determine Y2K compliance status of your critical business partners?

Answer. Early 1997.

Question 3B. Of the 750 non-respondents, are any of them utilities?

Answer. No.

Question 3C. Have non-respondents indicated why they are not responsive?

Answer. Yes. Any of the following four reasons are given:

—Concerns about legal liability resulting from an incorrect response.

—There are simply too many inquiries to respond to.

—The company is no longer in business.

—The person to whom the inquiry was addressed is no longer with the company.

Question 3D. Could you characterize the types of critical suppliers represented by the 180 respondents that you have “not” established as being compliant?

Answer. No. The data at this point do not indicate that suppliers of certain types of goods or services are more likely to be non-compliant than others. The suppliers for whom compliance has not been established are as varied, for example, as telecommunications equipment suppliers, fuel oil companies, electrical equipment repair services and highway paving contractors.

Question 3E. What types of contingencies are you developing for them?

Answer. For suppliers whose Y2K preparedness remains an issue, we will either find alternative suppliers or, as a last resort, temporarily increase inventories prior to 1/1/2000.

Question 4. Have you experienced any cases where vendor certified devices have failed your testing?

Answer 4. Yes. While we don't expect to complete our testing until first quarter 1999, we have experienced one such case to date. A test conducted by NYC Transit on one product, event recorders, failed. The manufacturer responded quickly and within one month replaced all the devices with compliant ones.

Question 5. What six application systems have supplier dependencies that will cause their completion dates to slip to first quarter 1999? What are the dependencies?

Answer. The applications, the affected agencies and the dependencies are as follows:

—MTA NYC Transit's On-line Transit Information System—Application is compliant but PC on which it runs requires replacement.

—MTA Metro-North Railroad's HR/Payroll System—Compliant version of installed package was not available from vendor until mid-1998. Additional time required to test new version and to modify interfaces with other systems.

—MTA Metro-North Railroad's Crew Management System—Additional time required by vendor to make requested modifications to new package.

—MTA Long Island Bus' General Ledger System—New version of installed package required by implementation of Y2K-compliant mainframe operating system. Completion date dictated by internal staff availability and other Y2K project priorities.

—MTA Long Island Bus' Accounts Payable System—New version of installed package required by implementation of Y2K-compliant mainframe operating system. Completion date dictated by internal staff availability and other Y2K project priorities.

—MTA Long Island Bus' Fixed Route Scheduling System—Additional time required by vendor to customize new package.

Question 6A. How are you inventorying and addressing data exchanges in the context of your Y2K program?

Answer. Like any large organization, the MTA has systems that exchange data electronically within the MTA as well as with outside companies. Our overall methodology for achieving Y2K compliance of computer systems, from the identification phase through implementation, addresses both applications that exchange data and

those that do not. Additional steps are required by our methodology if a system has data exchange capabilities. I did not make this distinction in my remarks.

Question 6B. How is scheduling and testing of data exchanges integrated into your program?

Answer. Scheduling and testing of these systems is guided by our standard methodology for achieving Y2K compliance of all computer systems.

EXCERPT FROM YEAR 2000/MILLENNIUM PROJECT—SEPTEMBER 1998

EXECUTIVE SUMMARY

This is the fourth of IST&P's semi-annual reports to the Finance Committee on MTA-wide activities related to the Year 2000/Millennium (Y2K) initiative. We have also prepared presentations and reports for the MTA's Permanent Citizens Advisory Committee and testified before the U.S. Senate Special Committee on the Year 2000 Technology Problem.

Year 2000 is a business continuation issue, not just an information technology issue. In this context, the MTA is aggressively addressing and resolving the numerous technical and business issues raised by Year 2000. As a result of the progress that has been made to date and the on-going efforts described in this report, we are confident that the MTA will continue to provide safe, reliable, uninterrupted mass transit and roadway services to the public into the next millennium.

Scope and goals

The MTA's efforts to assure business continuity into the next millennium are concentrated in three areas—computerized business systems, devices with embedded chip technology and vendors/suppliers.

The February report noted that "the MTA is positioned to achieve the majority of its overall Year 2000 project goals:

- converting critical applications by the end of 1998;
- converting the other applications during 1999; and
- upgrading the technology infrastructure as necessary to achieve Year 2000 compliance."

This is unchanged.

While the MTA would prefer that all critical devices containing embedded chip technology and all critical business partners be Y2K-compliant by the end of 1998, this is not achievable since some companies do not intend to offer compliant products or achieve internal compliance until next year. Consequently the MTA's goals in these areas are to achieve the following:

- identify all critical embedded technology and business partners. This has been done.
- determine their level of compliance. This is in progress and will be completed by year-end 1998.
- complete testing of selected devices with embedded technology. The remainder will be tested by the first quarter 1999.
- prepare an internal contingency plan when a critical vendor's compliance schedule jeopardizes essential MTA service(s). This will be completed by the first quarter 1999; many will be done by year-end 1998.

To assure that the MTA is properly focusing its efforts, we more clearly defined the criteria for a "critical" application, device, good or service. Something is now considered critical if it materially affects any of the following business activities:

- train, bus and/or facility operations (signals, power, communications, train scheduling, event recorders, heating/cooling)
- staff availability (crew scheduling, timekeeping, payroll)
- revenue collection and reporting (fare and toll collection, receivables, payables, general ledger)
- public safety (emergency response, signage, ventilation)

Business systems

This is the first and largest of the three areas addressed by the Y2K initiative. Activity here encompasses conversion of existing non-compliant systems and development of new systems that eliminates the need for additional conversions. Work is essentially complete in this area and we anticipate no problems.

Achieving Y2K compliance requires the modification of more than 300 systems on a variety of computing platforms as well as the development of more than 40 new systems. It includes systems with a combined total of approximately 52 million lines of program code. The applications support a broad spectrum of business functions

including equipment and crew scheduling, MetroCard, material management, fleet maintenance, payroll, general ledger and capital program management.

All critical applications residing on the mainframe are now subject to an additional level of testing, called "forward date testing" (simulation of a computing environment with calendar dates beyond 12/31/99), prior to production. The computing environments for both mainframe and mid-range computers in the Data Center will be completely Y2K-compliant by June 1999. Most of the hardware and operating system software already is compliant. Recommendations made by an independent consultant and supported by Lockheed Martin will help assure that MTA's Y2K mainframe testing and production needs are met. Expanded information regarding the implications of Y2K on the Data Center is contained in the NYC Transit section of the report since NYC Transit manages the Lockheed Martin relationship.

Conversion of non-Y2K compliant systems and development of new ones was well underway by 1996 and the goal was established that work on critical systems would be complete by year-end 1998. Modification of the 127 critical systems is basically completed and 60 have already been redeployed to production. An additional 63 will be in production by year-end; many have already been converted and only require forward date testing. Work on the remaining four systems will be completed in first quarter 1999.

Seven of the 19 critical systems that were to be replaced have already been implemented and six others will be in production by year-end. The remaining six new systems will be implemented in first quarter 1999.

Almost 55 percent of the non-critical system conversions have also been completed, as have more than 20 percent of the non-critical replacement systems. Activity in this area will continue to increase as work on the remaining critical systems is completed.

Embedded technology

This area addresses the technical systems and mechanical equipment in which computer chip technology is an integral part of their operation. Such devices are found throughout the MTA in places that include telephone systems, communications controllers, personal computers, radios (police, bus and train operations), EZPass, elevators, heating/ventilation/cooling systems, security devices, and the LIRR and Metro-North's train equipment, control systems and signal systems. Because of the age of our equipment and the nature of our operations, the MTA generally does not have many devices with date or calendar functions. Where we do, most of the technology is used for time recording and reporting and does not affect functions essential to our operations. For example, on-board event recorders may report the year incorrectly after 1999 but their basic function, gathering incident data, will have valid timelines. Based on what has been found so far, we do not expect any significant problems with embedded technology.

Agencies began work on embedded technology in mid-1996 and set a goal of determining the Y2K compliance of all critical devices and preparing test plans for verifying compliance by year-end 1998. Contingency plans are to be developed by the end of first quarter 1999 where device compliance remains an issue.

Agencies have identified all critical technical systems and mechanical equipment, and to date have determined that 172 or 54 percent of the 321 devices have either no embedded technology or date function or are said to be compliant by the manufacturer. All critical devices are subjected to testing where possible even when the vendor has stated that the device is compliant. A technical consultant will be engaged to develop and conduct test programs and to work with manufacturers in establishing alternative certification approaches where testing cannot be performed.

It has already been determined that with the exception of diagnostic equipment on the new technology test train, the entire subway fleet and subway signal system are not affected by any embedded technology; that no exposures have yet been identified to jeopardize operation of the bus fleets; that LIRR's fleet or power system are not at risk because of embedded technology; and that Metro-North's signal, train control system, rolling stock and radio systems are compliant.

Much has been accomplished in this area and significant activity will continue over the next three months—the remaining compliance assessments will be completed; certification tests will be conducted on additional critical devices and test plans developed for the remaining ones; and contingency plans will continue to be prepared where business continuity is deemed at risk.

Business partners

We began work to ascertain the Y2K status of vendors and suppliers after we had started work on embedded technology. The goal was to determine the Y2K-preparedness of all critical suppliers by year-end 1998 and to have contingency plans devel-

oped where readiness remained an issue by the end of first quarter 1999. By developing projections about overall supplier preparedness, knowing that suppliers will actively attempt to work around their own compliance issues and formulating contingency plans where necessary, we have concluded that the availability of essential goods and services will not be interrupted.

Agency procurement departments have reviewed all suppliers of goods and services with operating departments to identify critical suppliers. A total of 1,181 suppliers have been deemed critical including providers of diesel fuel, wheels, sand and salt, brake shoes and legal printing services. Letters seeking compliance information have been sent to all critical suppliers. While the initial number of responses was low due to different mailing schedules among the agencies and to suppliers' concerns about potential legal liability, second mailings and telephone contacts have substantially improved response levels. Where firms have not responded or not responded adequately, management staff is contacting them by phone or in person to discuss preparedness. MTA Headquarters staff prepared a suggested conversation script to help agencies obtain sufficient information. When responses to these late and follow-up mailings are tallied and factoring in our experience so far, we expect to see by year-end 1998 65 percent – 70 percent of critical suppliers reporting that they are now compliant or will be in sufficient time to avoid business disruption.

The area of business partners is the most troublesome since the MTA depends on so many companies including key ones like electrical utilities and telecommunications suppliers. There is little choice but to rely on their word, although in cases where a supplier is unique and critical to operations the supplier's efforts are reviewed in more detail.

Agency reports and appendix

More detailed information regarding specific agency progress in the areas of computerized business systems, devices with embedded chip technology and vendors/suppliers is contained in the following reports. Statistical information that summarizes the progress of all agencies in the three major areas is contained in tables in the Appendix.

Issues

There are two issues to bring to the Committee's attention, although no Committee action is required at this time.

The assessment and certification of critical embedded technology that cannot be tested needs to be addressed. The LIRR has developed an all-agency RFP to procure a technical consultant to assist in the effort and a contract award is anticipated in October.

Exposure to potential legal liability is limiting the clarity of responses from vendors and suppliers about their Y2K preparedness. License warranties and service agreements with them are being reviewed by MTA procurement and legal departments. Contingency plans will be developed by first quarter 1999 in cases where preparedness remains uncertain; many plans will be in place by year-end 1998.

Cost

In its February report to the Committee, IST&P projected the cost of the Year 2000 initiative to be approximately \$24.0M. The current projection is \$31.4M consisting of costs for internal staff (\$9.4M) and consultants (\$10.7M), new hardware and software required to achieve compliance (\$8.2M) and a contingency for unanticipated expenditures (\$3.1M).

This increase of \$7.4M from the February projection consists of:

- \$0.8M, due to inclusion for the first time of internal staff costs for activities related to embedded technology, business partners, user testing of non-compliant and replacement systems and oversight.
- \$6.6M, due to revised cost projections at NYCT (+\$5.0M for upgrades to Department of Subways' fiber optic network), LIRR (+\$0.5M for the embedded technology consultant and +\$0.5M to replace embedded technology) and Metro-North (+\$0.6M revision to internal staff costs for application conversions).

Regional coordination

In addition to individual agency programs, the MTA has been working closely with outside governmental and public interest groups to address Y2K issues affecting the metropolitan region and to discuss regional contingency plans.

In early September the MTA and NYS's Office for Technology jointly hosted the first meeting of state and local agencies and public authorities to discuss common regional issues and to determine the most effective way of coordinating activities. A primary goal is to develop an integrated contingency plan for the New York City area.

A new group, known as the Y2K Tri-State Network, has met three times since July as a forum in which various public and private organizations can share their knowledge and experiences in dealing with potential problems that could affect this region. The Regional Plan Association also recently launched a Y2K initiative to address the need for information sharing, contingency planning and public education. The MTA and its agencies are active participants in both groups, which include federal, state and city representatives as well as private sector participants representing power and telecommunications utilities.

The MTA has also independently requested information from key state and city agencies about the compliance of critical infrastructure elements on which it is dependent, as well as exchanged information with various emergency management offices.

Project organization and control

An effective management and oversight structure has been put in place for this initiative with agency Presidents and senior staff reviewing progress within their organization each month and with MTA Headquarters IST&P and Audit Services staffs independently assessing performance at various project milestones.

As reported previously to the Committee, each agency has its own project team led by its Chief Information Officer and involving staff from both technology departments and business units such as signals, power, maintenance of way, facilities, subways and buses. These groups report progress to each agency President on a monthly basis. In addition, MTAHQ staff oversees the efforts of the agencies, provides guidance on specific matters and prepares periodic reports such as this for the Committee on the status of the project.

The Y2K initiative includes an audit component. MTA's Audit Services has developed and issued a two-phase program to review the various segments of the Y2K effort. Phase I addresses identification and analysis activities; Phase II addresses testing and implementation. The program requires agencies to provide documented evidence of project plans, test results and compliance.

Phase I has been conducted for LIRR and it is now being completed for NYCT, MNR, Bridges & Tunnels and LI Bus. Audits of MTAHQ and Manhattan Data Center (Lockheed Martin's Y2K activities) will be initiated during the last quarter of 1998. Phase II will be initiated during the first quarter of 1999.

Next three months

During fourth quarter 1998, the MTA and the agencies plan to accomplish the following significant activities:

- Convert all but four of the remaining critical non-compliant systems and implement all but six of the remaining critical replacement systems, raising the completion rates to over 95 percent and to almost 70 percent, respectively.
- Review critical business components by compiling an all-agency checklist of the various systems indicating review, compliance/non-compliance and contingency plan status.
- Continue to address remaining non-critical systems, technology and business partners.

PREPARED STATEMENT OF JOYCE WRENN

Good Morning, Chairman Bennett and members of the Committee. My name is Joyce Wrenn. I am Vice President of Information Technologies for Union Pacific Railroad.

Thank you for the opportunity to speak to you about one of the most critical issues facing businesses today—Year 2000 compliance, and Union Pacific Railroad's efforts in that regard. Attached to my testimony is a statement from the Association of American Railroads (AAR) which discusses the efforts of the industry as a whole.

Union Pacific is the largest railroad in the country, operating 36,000 miles of track in 23 states. More than 50,000 employees on our railroad use computer technology every day and in almost every facet of their job to make sure that the goods entrusted to us are transported safely and according to plan.

Year 2000 (Y2k) has implications in all areas of our business, both commercially and operationally, and for our business partners as well. Our senior management places the highest priority on ensuring that Union Pacific Railroad is Y2k compliant prior to the next century. We are committed to making January 1, 2000 "just another day." Our top level executives monitor progress toward this goal through monthly and quarterly reports on Y2k issues. In addition, an executive level oversight position has been established to assure success in this effort. The following in-

formation includes an overview and a detailed status report on the Union Pacific Railroad's Y2k project.

OVERVIEW

The Y2k compliance project at Union Pacific Railroad is focused in five critical areas and includes software (internally developed and purchased), hardware and embedded chips inside equipment and machinery. The Railroad's enterprise-wide project encompasses computer systems and equipment in two data centers and a telecommunications network with thousands of personal computers, 3,270 terminals, radios, telephones connected with land lines, microwave, fiber optics and satellite links for data and voice communications spread over 23 states. Equipment containing embedded computer chips include locomotives, automated train switching systems, computer aided train dispatching systems, signaling systems, computerized fueling stations, weigh-in-motion scales, cranes, lifts, PBX systems and computerized monitoring systems throughout the company. In addition to the equipment described above, we are dependent on 72 million lines of code in mainframe systems, over 100 newer client/server applications with 8 million lines of code, and millions of daily EDI transactions with customers, vendors and other railroads plus services from hundreds of service providers. Fortunately, work began early on our Y2k project by starting the research in 1994 and completing an impact analysis of our mainframe COBOL systems in 1995. The Y2k project began in earnest in 1996 and has been a number one priority ever since.

Union Pacific decided the best way to approach this complex enterprise-wide project was to divide it into five sub-projects:

- Mainframe Systems
- Client Server Systems
- User Department Developed Systems
- Vendor Supplied Software, Hardware & Embedded Systems
- Electronic Commerce and EDI Systems

All sub-projects have completed inventory and assessment phases, and have detailed project plans in place. Renovation, testing, and implementation is well underway, and many areas are scheduled to be completed in 1998. In addition to the importance of the five sub-projects listed above, addressing project management issues is vital to the success of the project. These include establishing disciplined project management, providing effective internal and external communications, performing contingency planning, creating documentation and minimizing risk. A description of project management issues, recent Y2k events, and the five sub-projects follows.

PROJECT MANAGEMENT

Building on Union Pacific's foundation of concurrent planning and project management methodology, a Y2k enterprise approach to project management was developed. The Y2k management processes include committed executive management sponsorship, deliberate project planning, robust measurements, regular project updates and an adequately staffed Project Management Office (PMO) with experienced personnel.

To provide the necessary management support, project managers are assigned to each of the five sub-projects. For the Mainframe Systems, additional project managers are responsible for the COBOL systems, the Transportation Control System (TCS), and the FOCUS Systems. Departmental coordinators are assigned from each department to coordinate their part of the project. For every sub-project, business experts and technical systems experts are vital to the success of the project and completing the tasks on time. Formal project review meetings are held several times each month. In addition, the project managers meet informally with each of the various teams and individuals.

COMMUNICATIONS PLAN AND MEASUREMENTS SYSTEM

An effective communications plan and measurement system was established early in the project. The communication plan is coordinated with our employee communications group, public relations, our attorneys, marketing and the purchasing department. The communication plan includes letters, surveys and follow-up telephone calls to our suppliers, blanket communications to our customers and completing the surveys customers send to us concerning our Y2k project. These plans include a Y2k Hotline number, Y2k E-mail address, and also internal communications with employees and management.

The measurement system proved to be an indispensable piece of the communications plan. The metrics provide summarized progress reports for executive management and detailed reports for the groups working on the project. Information from

these monthly and weekly progress reports is communicated regularly to all the employees through printed newsletters, Lotus Notes and our internal Web Site. Everyone on the team and all the people assisting the team know the current status of each project.

CURRENT PROJECT STATUS

1. Mainframe systems

Software developed for enterprise-wide mainframe systems are essential to the business. In 1995, Union Pacific began the research, evaluated the market and vendors, and completed a pilot project to begin to address the Year 2000 issue, and in 1996, we completed the inventory of thousands of programs. Currently, nearly 80 percent of these systems have been converted, tested, implemented, and certified Y2k compliant by August 1998, and the rest are on plan to be completed by December 1998.

2. Client server systems

Union Pacific has over 100 enterprise client server systems in production or under development. In 1998, a full-time project team was established to assist the application project managers in testing these systems and data feeds to and from mainframe systems that may be using two-digit years. Currently, over 30 percent of these systems are completed, and all critical client server systems are on plan to be certified Y2k compliant in 1998, and the non-critical systems early in 1999.

3. User department developed systems

This category includes mainframe and PC-based systems developed by internal user departments. Headed by a coordinator within each area, departments have currently completed over 70 percent of their systems, and the remainder are on plan to be completed in 1998.

4. Vendor supplied software, hardware & embedded systems

The Y2k work is not limited to the company's internal systems. Union Pacific continues to contact vendors, governmental agencies, financial institutions, and even competitors to verify that they are prepared. The scope of this project includes vendor-supplied software, desktop, mainframe and server hardware, as well as databases and operating systems.

Union Pacific is working with connecting short line and regional railroads via our involvement in various AAR committees. In cooperation with the AAR, Union Pacific is sharing information on the compliance and testing of safety critical components common to the industry. Union Pacific has committed to help fund the development of a shared Web site for this purpose, and access to this information should be available in the 3rd quarter of 1998.

We are also asking essential suppliers to inform us of the Y2k status of their internal systems. Our vendors must ensure that their internal systems are compliant so that they will continue to provide products and services to the Railroad beyond the year 1999. In 1998, we have to date identified 335 highly critical companies and our Supply Department currently has responses from over 90 percent of our critical suppliers indicating they have a solid Y2k project plan.

Each department is responsible for the equipment and software they purchase, maintain and/or manage. Each department head is personally involved and has completed their inventory and determined which components are critical. Currently, departments are assessing Y2k compliance of their critical items and following up with their critical vendors. The Y2k Project Management Office is monitoring performance against the project plan.

To assure safety and Y2k compliance, selected critical software, hardware, and embedded systems are being tested by Union Pacific, even if it has been certified by the vendor.

5. Electronic commerce and EDI systems

Union Pacific's electronic commerce and EDI systems Y2k project covers all the electronic exchanges of information with customers, vendors, other railroads and banks.

The railroad industry has agreed on a Y2k EDI transaction standard that will be implemented in late 1998. This standard requires a 4-digit year. Union Pacific is taking a very active role with the AAR in testing the new standards with other railroads and trading partners. Since many companies will continue to use 2-digit years, Union Pacific will be able to support older versions of EDI transactions and interpret the 2-digit year to the appropriate century for our internal applications.

CONTINGENCY PLANNING

Despite our best efforts, we recognize that total coverage of all Y2K internal and external problems is unlikely. Therefore, another area of focus is Y2k contingency planning. We will complete this plan in 1998 and adjust as needed in 1999. Currently, we plan to have a Y2k command center staffed 24 hours a day in the fourth quarter of 1999 and continuing into early 2000 for any problems that might occur due to the Y2k. The staff will be comprised of technical experts to fix or advise what to fix if systems fail, and knowledgeable representatives from each business unit. Although we have planned for January 1, 2000 to be just like any other day, contingency plans will be ready to implement just in case.

DOCUMENTATION

We are carefully documenting all our work to provide repeatable and demonstrable processes. We are documenting and storing internal and external correspondence and E-mail; all the project plans; test plans, test results and test data, progress and status reports, responses to our surveys and notes from telephone conversations with our key vendors.

RECENT EVENTS

On July 21, 1998 Union Pacific's Y2k Project received an exceptionally good rating from Electronic Data Systems (EDS) after it completed an independent audit of Union Pacific Railroad's Y2k Readiness for a large automobile manufacturer. Some of their comments follow:

"The Y2k project is number 1 priority with the Union Pacific Corp. * * * The project and Y2k preparedness have the full support of the highest levels of the Corporation."

"Union Pacific has demonstrated full commitment and exceptional processes and documentation to assure Y2k compliance."

"Assessors reviewed management reports, schedules, project plans, and detailed documentation, both printed and on-line, and found them to be exceptional."

"Union Pacific has done a very detailed analysis of their suppliers and components and is well on track to contact and evaluate all critical suppliers and components by year end 1998."

"Union Pacific has plans to implement manual systems in case unforeseen situations develop which may impact support of their customer base."

"An exceptional Y2k Readiness project is in place. Union Pacific can and should be proud."

That concludes my testimony, and I would be happy to answer any questions you may have.

STATEMENT OF EDWARD R. HAMBERGER, PRESIDENT & CEO, ASSOCIATION OF AMERICAN RAILROADS

The Association of American Railroads (AAR) appreciates this opportunity to present its comments for the record on the impact of the Year 2000 problem on the railroad industry. AAR's members account for 93 percent of the railroad industry's freight revenues, operate 77 percent of the railroad industry's line-haul mileage, employ 91 percent of rail workers, and operate almost all of the nation's intercity passenger trains.

All segments of the rail industry are very much aware of the critical importance of addressing the potential problems that could affect computer systems with the century change. Railroads and rail suppliers are actively engaged at every level in identifying and preventing these problems. In this testimony we will provide insight into the industry's experience to date in safety-critical areas and share the project management approach being taken.

From a railroad perspective, Year 2000 efforts need to focus primarily on two critical areas: safety and service continuity.

FOCUS ON SAFETY

Our first priority is the safety of our employees, customers, and the public at large. Our industry has made significant strides in safety over the past two decades. The train accident rate has fallen by 23 percent since 1990 and by 68 percent since 1980. Employee lost workday injury and illness rates are down 52 percent since

1990 and 62 percent since 1980. Railroads will not let the Year 2000 challenge blemish that record of improvement.

The rail industry's Year 2000 efforts in safety-critical areas address mainframe computer systems, decision support systems, and a variety of components supplied by vendors, including embedded devices. Railroads have received many inquiries about signals and highway grade crossing devices and have good news to deliver in response to these inquiries. Research and testing experience so far shows that the safety-critical aspects of signals and grade crossing devices do not employ date calculations. Because of this they are not subject to the sort of Year 2000 problems that affect credit cards, telephone systems, and older mainframe computer programs. However, the industry does not plan to stop the research and testing until we are assured that every safety-critical component and system will operate properly before, during, and after the century change.

SERVICE CONTINUITY & PROJECT MANAGEMENT

Service continuity is a major concern to the rail industry and our customers due to the tremendous amount of rail traffic which is handled by two or more railroads in inter-line movements (25 percent of traffic and 33 percent of rail freight revenue). At a recent meeting the Federal Railroad Administration hosted a general Year 2000 issues on July 20 for freight railroads, rail suppliers, commuter railroads, and Amtrak, eight AAR member railroads were represented and four made presentations on their Year 2000 activities. One key point made was that operations at large railroads in particular depend on information technology. For this reason, railroads cannot take the chance that they will be able to continue to operate at current levels without addressing the potential for Year 2000 problems.

Having identified this critical issue, AAR member railroads instituted formal project management procedures. CEOs are updated regularly on progress. Responsibilities are clearly defined, resources are budgeted, and detailed plans outlined to address the various potential problems. Formal weekly status meetings are the norm.

Efforts to address Year 2000-related problems have been underway at railroads for several years. The first stage of addressing Year 2000 problems at most railroads was completion of an inventory of potentially affected systems and components. This work, by necessity, has been carried out inside the information system departments as well as in the field. This process also includes division of the inventory into critical and non-critical, often with several categories ranging from safety-critical down to "nice to have." In the second stage railroads perform impact analysis, or preliminary testing, to determine which systems or components actually experience problems when presented with the century change or other "special" dates.

Once the potential problem areas are identified the third stage remediation, begins. One railroad estimates that 3 to 4 percent of their core mainframe lines of code need remediation. AAR believes this is typical. Following remediation, the upgraded system or component needs to be tested to assure that it will perform as required before, during, and after the century change.

The last stage is contingency planning. Railroads have identified the need to develop detailed contingency plans that can be activated if required.

Within their Year 2000 Project Offices, most railroads distinguish between their Information Technology (IT) related work and their Enterprise, or business, work. Specialists are deployed in each area so that appropriate skills and knowledge gained from past experience can be applied. The IT work, particularly addressing core mainframe systems, began before the Enterprise area work. AAR understands that its members expect to complete the great majority of their IT work this year. The Enterprise work is also well underway, but is expected to stretch into 1999.

While most Year 2000 work is performed at the individual railroads, there are supportive activities at the industry level. The AAR Board of Directors has stimulated activity and receives regular status reports, as do other groups with representation from railroad Chief Operating Officers, Chief Marketing Officers, and Chief Information Officers.

The North American Rail Industry Year 2000 Coordination Task Force was formed to manage the industry level activities and includes members from large and small railroads, with staff support from AAR. The Task Force engages in cooperative efforts to support North American railroads working to prevent the century change from negatively affecting rail industry safety and service.

Due to the nature of North American rail industry operations, more than one railroad must work together to handle many customer shipments. This is supported by extensive interaction among railroad information systems and has led to the development of various central information system applications at Railinc, AAR's infor-

mation technology department. The Task Force has developed a plan for testing these systems to ensure that the separate railroad information systems interact appropriately when presented with situations where Year 2000 and related date issues might arise. The Task Force expects that the most significant portion of the testing work will be completed in 1998.

Further, the Task Force has agreed to leverage the knowledge gained at individual railroads by sharing information from Year 2000 research, testing, and remediation of systems and components. This information will be available to large and small North American railroads in a structured data base through a secure electronic access mechanism. Also, the Task Force is planning joint research and testing in selected areas.

Total expenditures on Year 2000-related activities are expected to be in the hundreds of millions across the AAR member railroads.

CONCLUSION

AAR hopes it has conveyed the seriousness with which the rail industry is approaching the threat of Year 2000 problems. AAR believes that the rail industry's approach will enable it to continue safe, customer-responsive, efficient rail operations before, during, and after the century change.

RESPONSES OF JOYCE WRENN TO QUESTIONS SUBMITTED BY CHAIRMAN BENNETT

Question 1. Your recent merger with Southern Pacific and Santa Fe railroads has added a large operating segment to the Union Pacific including tracks, facilities, equipment, personnel, suppliers, and customers.

(A) What kinds of Y2K problems did the merger create?

Answer. Burlington Northern merged with the Santa Fe, but our merger with the Southern Pacific did not create any specific Y2K related problems other than scope.

(B) Please briefly explain how the combined railroad management plans, analyzes and implements a Y2K program on such a vast scale considering the differing cultures of the acquired companies?

Answer. The Union Pacific Year 2000 project was built on our foundation of concurrent planning processes that include committed executive management sponsorship, deliberate project planning, robust measurements, and regular project updates on an enterprise approach. For every sub-project, business experts from all critical areas are assigned from each department to coordinate their part of the project. The Year 2000 project at Union Pacific is truly managed as a business challenge, not a technical problem.

Question 2. Please explain how Union Pacific tests general purpose embedded microprocessors that frequently include timing logic segment which may or may not be triggered on January 1, 2000?

Answer. Microprocessors with timing logic segments must have a power source, either internal or external, that is used to set or adjust the date and time. While microprocessors that are using an internal power source have not been identified on the railroad, our embedded engineers do have experience resetting the internal clocks on these type of devices, generally by uploading a program to accomplish the date change. On the equipment we have seen so far, the source of the date/time has been easily identified, reset, and tested.

Question 3. Are you aware of any overall assessments of the preparedness of the railroad industry? if not, can you hazard a guess as to preparedness and what some potential show stoppers might be?

Answer. The AAR may be able to provide the best overall assessment of the railroad industry. So far, no railroad has identified any show stoppers to our knowledge.

Question 4. You mention Contingency Planning in your formal statement to the Committee Ms. Wrenn. Would you briefly explain to the Committee what elements of railroad operations would be covered under such a plan? e.g. engines, fuel supplies, dispatching—just what?

Answer. High level department coordinators have been assigned in 14 critical business areas including the National Customer Service Center (NCSC), Dispatching, Facilities Management, Timekeeping, Crew Management, Finance, Supply, Transportation, Mechanical, Locomotive, Telecommunications, Data Centers, and Information Systems. Each functional area is creating contingency plans, or defining their requirements for support from other areas, in 7 major categories of contingency events as applicable. These 7 categories are:

—Key Data—Integrity/Loss

- Critical Software—IT Supported/Off the shelf
 - Critical Hardware/Equipment with embedded microprocessors
 - Communications—Internal/External, Voice/Data
 - Critical Supplies and Suppliers
 - Facilities
 - Key Personnel
-

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

STATEMENT OF THE AMERICAN TRUCKING ASSOCIATIONS, INC.

INTRODUCTION

The American Trucking Associations (ATA) is the national trade association of the trucking industry. The ATA federation represents over 37,000 trucking companies, with an affiliated association in every state, and 14 conferences representing individual segments of the industry. The ATA federation represents every type and class of motor carrier in the United States. While there are more than 37,000 trucking operations in the U.S., it's important to note that 70 percent (70 percent) of the nation's trucking companies are small businesses, operating fewer than six trucks. The Information Technology Council (ITC) is a part of ATA which comprises motor carrier information technology (IT) professionals in addition to software and hardware vendors and IT service providers that specialize in technologies that support the trucking industry. ATA and ITC appreciate the opportunity to comment about the Year 2000 problem and its impact on the trucking segment of the transportation industry. Trucking is a highly competitive industry with relatively small profit margins. In order to become more efficient and provide better service to its customers, the industry fully embraces the use of mature technologies where they are cost-effective and make good business sense. For many motor carriers, the use of technology has become more than a means to obtain a competitive edge—it has become a necessary cost of doing business. The fact that ATA has taken the opportunity to submit comments to the Senate Special Committee underscores our concern and commitment to addressing this issue.

INDUSTRY SCOPE

The transportation industry is very large and is a key sector of the economy. Americans spend more than \$420 billion a year on freight transportation. According to U.S. Department of Transportation (DOT) statistics, this represents approximately five percent (5 percent) of the U.S. gross domestic product. The air, rail, and maritime sectors certainly contribute to these numbers. However, the trucking industry hauls the lion's share of this freight. Over 6.5 billion tons of freight was shipped by truck in 1996. This is about 60 percent of the total domestic tonnage that was shipped. According to forecasts by Standard & Poor's DRI, the volume of freight shipments will increase by 21 percent (21 percent) at the rate of two percent (2 percent) per year by 2006, including increased shipments to Canada and Mexico, where trucks dominate cross-border freight movements. Moreover, 77 percent (77 percent) of all communities in the U.S. depend solely on products delivered by trucks. In 1996 over nine million people were employed throughout the economy in jobs that relate directly to trucking. Over one third of that nine million were employed as commercial truck drivers. These are impressive numbers, yet the trucking industry is only one link—albeit a very significant link—in the total supply chain that has many different players and trading partners. Among these trading partners are: shippers, brokers, freight forwarders, logistics services providers, and the customers that receive the freight. Motor carriers are an integral part of a very large, complex, and dynamic transportation and distribution system.

Y2K RISKS TO MOTOR CARRIERS

Because of the size and scope of the trucking industry, and the great extent to which technology is employed by the industry, one can appreciate why motor carriers are concerned about the potential impact of the Year 2000 problem. Mr. Capers Jones, a Burlington, Massachusetts software consultant has said: "With possibly 5 percent (5 percent) to more than 20 percent (20 percent) of the Year 2000 problems still unrepaired and remaining in software after the century ends, the probability

of significant damages is alarmingly high." If only 5 percent (5 percent) of the industry were to come to a standstill, it would have a significant economic impact.

Motor carriers are very dependent upon technology. More and more, the information that they process is as important as the freight that they haul. Technology is being used extensively to provide large amounts of information quickly, accurately, and efficiently. Any major disruption in that information flow would affect service to trucking company customers, seriously affect the motor carrier's bottom line, and could cause some companies to fail. And because trucking plays a pivotal role in the total supply chain, the potential economic impact could be staggering.

While many of the systems that support day-to-day motor carrier operations depend on real-time data, the trucking industry also uses many systems that are date sensitive and could be affected by Y2K. These systems are diverse and the associated risks are varied. Affected systems include mainframe applications and systems software, mid-range and client/server applications, network software, PC systems and application software, facilities, and telephone systems.

Many of the motor carriers depend upon wireless and satellite communications systems to dispatch their fleets, keep track of their tractors and trailers, and provide expedited delivery of the freight on time to their customers. The smaller, less sophisticated companies that use the time-tested methods of paper and pencil, telephone calls, and facsimiles to communicate, now also use affordable e-mail to interact with trading partners if they have at least one PC at their disposal. Even some of these systems are at risk.

The same telecommunications technologies are used to collect data that is necessary for fleet maintenance that keeps the trucks rolling. Not insignificant is the increasing use of advanced technologies to keep drivers in touch not only with their dispatcher, but also, with their families—an application which has helped motor carriers improve drivers—quality of life and recruit and retain better, safer drivers.

In addition to the technologies employed in operations and maintenance, many trucking business or back office functions use date-sensitive computer software applications. Electronic commerce, whether by electronic data interchange, i.e., EDI, or on the Internet, is a way of doing business and is essential to the viability of the trucking industry. Major companies routinely send nearly 4,000 EDI messages daily, often to as many as 500 different trading partners. These messages include load tenders, shipping and pick-up notifications, shipment status messages, purchase orders, bills of lading, and invoices.

Motor carrier accounting, finance, and payroll systems, whether company-operated or out-sourced, are maintained on computer systems that operate on date-sensitive software.

ATA AND INDUSTRY REMEDIATION EFFORTS

ATA has been aware of this challenging Y2K issue from its early stages. Recognizing that there is an entire industry of consultants and software experts that has emerged to help with Y2K, ATA is playing its part in remediating the problem for motor carriers. ATA provides its members with information and education on the problem as Y2K relates specifically to the trucking industry. Throughout ATA's federation of conferences, councils, and state associations, there have been many seminars and panel discussions conducted on the issue. During its Annual Management Conference and Exhibition, which will be held on October 25–28, 1998, ATA will host a general session on integrating shipper and carrier technology. Shippers, technology vendors, and motor carriers will all share their views on Y2K and other IT issues. In addition, numerous articles aimed at heightening motor carriers' awareness of the problem have appeared in industry trade publications, including *Transport Topics*, the national newspaper of record for the trucking industry, and ATA newsletters that are distributed widely throughout the trucking industry. Moreover, ATA has partnered with both private and public organizations, including DOT, not only to better understand the extent and impact of the Y2K problem, but also, to identify and support viable, effective solutions.

ATA's Information Technology Council actively participates in the development of American National Standards Institute (ANSI) X12 standards which are the backbone of EDI messages that are used in electronic commerce throughout the trucking industry. ATA has published an EDI Implementation Guide that provides details essential for mapping data that includes references to a specific century in all date fields of the various business transactions. Previous reference to dates was accomplished by indicating only six characters, i.e., YYMMDD, or 99 12 31 for December 31, 1999. The latest version of the ANSI standard, explained in the ATA Guide, incorporates the use of an eight-character field, CCYYMMDD, or 20 00 01 01 for January 1, 2000, which unambiguously identifies the correct century. ATA and ITC are

encouraging all motor carrier EDI users to migrate to and use translation software based on this version.

Based on informal surveys and discussions with IT professionals from a variety of the companies in the trucking industry, ATA is confident that the trucking industry is taking this issue seriously. Real work is being done to fix it. According to industry analysts, approximately 29 million dollars and thousands of man-hours are being spent by transportation companies to address this problem. Many of the larger companies have had on-going programs for the past several years. The Y2K programs vary from company to company, but generally encompass the following:

- putting someone in charge
- setting up teams
- identifying and analyzing the problem areas
- searching lines of code
- rewriting affected software
- retiring and replacing outdated applications and systems with newer compliant ones
- testing the fixes or new systems that have been installed

In addition, motor carriers are talking with their trading partners and vendors to obtain assurance of their Y2K compliant systems. Engine manufacturers, for example, have responded that electronic engine components will not be affected by Y2K because key data is based on hours expended rather than calendar dates. The motor carriers that have large information technology staffs are dedicating 15 percent (15 percent) or more of those staffs solely to remedying Y2K problems. In addition, many are using outside vendors to augment their teams to review and rewrite lines of code.

CONCERNS

Even with all this effort being expended, some issues still remain that essentially are outside the purview of the motor carriers to control. Some experts have estimated that as much as 10 percent (10 percent) of all shipments and deliveries will be delayed on January 1, 2000 and thereafter. The fact is no one really knows!

On balance, the trucking industry is very aware of the problem and is making a significant effort at remediation. The trucking industry will have its house in order by January 1, 2000. ATA and ITC are confident that there will not be a catastrophe among motor carriers because of what they are doing now to deal with their problems. However, even though some firms might go so far as to consider Y2K as a non-event, one should be more realistic. KPMG Peat Marwick, LLP, a leading consulting firm, has warned that as of February 1998 only 23 percent (23 percent) of federal transportation agencies' critical systems were Y2K compliant. It is a well-known fact that where computer software is concerned, history has shown that there will always be some glitch that will require yet another correction. It is the very nature of software. Software experts have said that it is naive and risky to assume that 100 percent (100 percent) of Year 2000 errors will be found and repaired, since the U.S. average for other kinds of bugs is only about 85 percent (85 percent) defect removal efficiency and even "best in class" results are below 99 percent (99 percent) in efficiency.

Therefore, as diligent as the trucking and other industries are, there undoubtedly will be latent defects and secondary errors remaining after January 1, 2000. We know, for example, that levels of defect removal for code errors do not usually exceed 95 percent (95 percent) efficiency. Statistically that may be high, but is not high enough for Y2K when one considers the millions of lines of code that are affected. Test error efficiency is much higher—99 percent (99 percent)—but much of the testing will not occur until well into the millennium.

ATA and ITC have a positive opinion on the outcome of the effort of the larger companies that are well capitalized and able to deal aggressively with Y2K problems. Our opinion is more guarded about the ability of the small and medium sized trucking companies that have neither the funds or the requisite expertise to handle problems of this magnitude. Some may still be in denial or have only begun to mount any effort toward dealing with the problem. It is clear that any government-sponsored Y2K information campaign should target these companies.

As mentioned at the beginning, motor carriers are participants in a very complex supply chain. They have deeply layered business relationships and depend on many outside agencies and organizations, both public and private, to make the supply chain function effectively and efficiently. There are many systems on which they depend that must function in order for trucks to deliver the freight to the customer. Many systems, we are told, although based on advanced technologies, are not affected at all by the Y2K problem. However, since the function and operation of these

systems is outside the control of the trucking companies, one can only trust that this analysis and assessment is accurate. We will continue to ask penetrating questions and hope that other players are as concerned and diligent in their efforts as motor carriers are. This remains a very large area of uncertainty for the trucking industry as well as for others. For example, we do not know how well the Federal, state, and local governments who have responsibility for the very infrastructure of roads, highways, and traffic systems that motor carriers depend upon, as well as for the licensing of their drivers and vehicles, are coping with this problem. We do not know about the reliability of the phone systems and other telecommunications networks that have become an integral part of the way motor carriers do business. And what about the energy systems, the oil, gas, and electric that carriers must have to run the trucks and operate their facilities? Moreover, we have concerns about the finance and banking industry that processes carriers' payrolls, cash transfers, and business transactions. Lastly, we have some concerns about increased costs which may result because of possible litigation. While motor carriers are end users—not the developers—of most of the software, trucking companies may be caught up in the web of litigation which could result if systems fail and delivery schedules are not met. Most of the trucking companies are working in the trenches, following the industry's leaders who have programs in place and expect to be fully Y2K compliant as we greet the next millennium. However, the trucking industry also expects that there will be date problems in software after the century ends, and both the public and private sectors of the economy must be prepared to address them—perhaps even well after January 1, 2000.

Thank you again for the opportunity to comment on this important issue.

STATEMENT OF CSX CORPORATION

CSX Corporation ("CSX") submits these comments in connection with the Committee's September 10 hearing on "Transportation After Y2K: Can We Get There From Here?"

In 1996, CSX Corporation and its subsidiaries began a comprehensive initiative to address and resolve the potential exposure associated with the functioning of its information technology systems and non-information technology systems (including embedded technology) with respect to dates in the Year 2000 and beyond, commonly referred to as the "Y2K Problem" and the "Millennium Bug".

CSX's remediation efforts are focused first and foremost on the continued safe operation its rail and other transportation systems, encompassing both employees' personal safety as well as the safety of the general public and the environments in which we operate. Maintaining service continuity both to our customers and with our vendors before, during, and after the millennium change is also a high priority. CSX is also taking steps it believes are necessary to insure the efficiency and integrity of our infrastructure and to minimize internal operational interruptions.

Overall, the CSX Year 2000 initiative is currently proceeding on schedule with completion of all key areas expected by mid-1999. The company's Y2K remediation efforts are aligned into five (5) parallel efforts: Core Information Systems, Distributed Information Technology, Electronic Commerce, Non-IT (embedded) systems, and Trading Partners.

The remediation of data center hardware and software is progressing, and a major portion of software and hardware products have been upgraded. CSX anticipates that it will have resolved the Year 2000 issue for all mission critical applications by the end of 1998 and for all non-mission critical applications by June 1999. With respect to distributed information technology, CSX has assigned project managers to assess and remediate its distributed applications with a view to completion by early 1999.

In the area of electronic commerce transmissions, CSX is upgrading its applications to Year 2000 standards as part of its regular application maintenance effort. Because the potential exists that not all of CSX's trading partners will achieve Year 2000 compliance, CSX is preparing to accommodate non-Year 2000 electronic commerce transmissions as well as Year 2000 ready transmissions.

With respect to non-information technology systems, CSX is currently conducting assessments of its rail classification yards, shipping ports, container vessels, intermodal ramps, and office facilities. In July 1997, CSX and its vendor tested CSX's rail transportation dispatch systems for Year 2000 complications and, based on the results of those tests, the vendor has been making upgrades to the systems which are expected to be completed by the end of 1998.

As part of its Year 2000 initiative, CSX is in communication with its significant suppliers, large customers and financial institutions to assess their Year 2000 readi-

ness and expects to conduct interface tests with its external trading partners in 1999 upon completion of internal testing of remediated applications.

In connection with its integration of Conrail, CSX and Norfolk Southern are jointly addressing the Year 2000 compliance of Conrail's core information technology applications and non-information technology embedded systems. Certain of Conrail's operations systems are being made Year 2000 compliant as a contingency in the event that there are delays in the integration or Conrail continues to operate such systems after the integration is completed.

CSX has incurred total expense of \$23 million to date related to the Year 2000 issue. The remaining cost of the Year 2000 initiative is presently estimated at \$62 million. The remaining cost and the date on which the company believes it will complete the Year 2000 initiative are based on management's current estimates, which are derived utilizing numerous assumptions of future events including the continued availability of certain resources, and are inherently uncertain.

CSX has made Year 2000 readiness a top priority and believes that its planning efforts are adequate to address its Year 2000 concerns. There can be no assurance, however, that CSX's efforts will be successful in a task of this size and complexity. CSX is currently assessing the consequences of its Year 2000 initiative not being completed on schedule or its remediation efforts not being successful. Upon completion of such assessment, CSX will begin contingency planning, including efforts to address potential disruptions in third-party services, such as telecommunications and electricity, on which the CSX's systems and operations rely.

CSX is undertaking all of the activities that it believes are reasonably necessary to be ready for the millennium change. The Year 2000 poses genuine technical problems to the entire world. CSX is keenly aware that its own and its customers' businesses are dependent upon the performance and dependability of CSX's systems. CSX's top executives, management and technical staff are committed to bringing CSX Year 2000 ready sufficiently in advance of January 1, 2000 to permit smooth functioning of all core systems. Adequate backup plans will exist as a contingency, and CSX will staff and operate a Y2K Command Center during the transition to perform triage and react to any unforeseen problems. CSX has a long history of successful operation of its railways and other transportation systems and believes that it is bringing the necessary resources to bear to continue that tradition into the next millennium.

Presently, there are at least four (4) measures that have been introduced in Congress dealing with the Y2K problem. These bills, collectively, provide for the free flow of information between companies by setting standards for when liability will attach, as well as providing for the suspension of antitrust laws to allow businesses to share information about their respective Y2K computer problems. The flow of information between companies and the public did not begin in earnest until July 29th when the Securities and Exchange Commission issued an interpretive release to public companies on making clear disclosures to shareholders about Y2K issues. Although this has shaken some Y2K information loose, it is still not enough. Congress can assist CSX and all other companies first and foremost by passing appropriate disclosure legislation as quickly as possible. Since the time left before January 1, 2000 is finite and decreasing, time is truly of the essence. Lastly, CSX and other companies need protection from frivolous litigation for Y2K failures where they can show that they made reasonable good faith efforts to remediate the problem.

STATEMENT OF STEPHEN ROBERTS, CHIEF INFORMATION OFFICER, INFORMATION TECHNOLOGY SERVICE CENTER OF THE NATIONAL PASSENGER RAILROAD CORP.

Mr. Chairman and Members of the Special Committee on the Year 2000 Technology Problem, I appreciate the opportunity to be able to submit this testimony for the Hearing Record, discussing how Amtrak has prepared for the year 2000 calendar change over. My name is Stephen Roberts and I am the Chief Information Officer for the Information Technology Service Center (ITSC) at Amtrak. The ITSC is responsible for identifying and implementing technology changes required to Amtrak's systems in preparation for the year 2000.

Amtrak's Year 2000 project is progressing according to plan with all of its main-frame systems on schedule for changes for the year 2000. The project remains within budget and is on target following the year 2000 methodology most widely used in the industry.

Amtrak began preparing for the year 2000 calendar change over in October of 1996 when it began securing funding for an assessment of its business systems and for a legacy system inventory. In January of 1997, Amtrak's Year 2000 project was

fully staffed and activated. Amtrak has since completed the assessment of its business applications and an inventory of all of its legacy mainframe systems.

In all, Amtrak has worked with three companies, specializing in remedying legacy business application systems for the year 2000. The companies have augmented Amtrak IT staff assuring the availability of skilled programmers to make code changes and to complete the testing of the year 2000-ready code. Because a high priority was placed on assuring the readiness of Amtrak's reservation system (ARROW), Amtrak contracted with specialists in reservation systems to assess ARROW's readiness for the year 2000. This assessment was completed in June of 1997 and found that only 9 out of ARROW's 5,000 programs required changes to become ready for the year 2000 calendar. These changes have since been made and Amtrak has begun testing ARROW and its communication links to the airlines and travel agencies.

Amtrak also places a high priority on assuring the readiness of its operations and safety for the year 2000 change over. As a result, Amtrak's Assistant Chief Engineer initiated the Communications & Signals Year 2000 Compliance Program. The purpose of the program is to evaluate every device and software process used in the day-to-day operations of the signal or communications system that are either micro-processor or computer based. Key vendors are requested to provide certification of equipment that contain embedded computer chips. The electric power companies that supply electric power to Amtrak in the Northeast Corridor have already been contacted requesting a certification of their systems' readiness for the year 2000. Responses are being received from the utilities attesting to active year 2000 projects and their planned year 2000 readiness. To date, no year 2000 equipment issues from the embedded computer chips have been identified.

Amtrak has also hired a contractor to perform an assessment of the software for the Centralized Traffic Control systems (CTC). A report has since been issued identifying all of the programs that require year 2000 related changes, including year 2000 changes to the operating systems and third party software used by CTC. All modification and testing of these programs are scheduled for completion by the first quarter of 1999. Amtrak has also contacted its supplier of communication software linking locomotives to the operations centers to verify the software's year 2000 readiness. Amtrak is presently testing the train communication software as a part of the year 2000 project.

Amtrak has also contracted with IBM and IMR (Information Management Resources, Inc) to convert 54 application systems. Amtrak selected these companies through a competitive bidding process because of their experience and expertise in readying legacy systems for the year 2000 calendar change over. Both companies have made excellent progress converting affected programs that are now being tested to validate the accuracy of the year 2000 program changes.

IBM has also initiated a project that identifies the computer equipment and software used at Amtrak. As a result, many of the computer hardware and software items listed in the document have now been certified year 2000 ready by the vendors. IBM and Amtrak are also verifying this information through independent testing of the hardware and software components.

Finally, Amtrak is proud to report that it is on schedule to convert all of its other business information systems by the year 2000. Amtrak has already converted its Travel Agency Processing system, and the programs are now ready for implementation into production. The success of this conversion was particularly important since this system served as a pilot project for validating our year 2000 conversion methodology. Amtrak is also in the process of upgrading its material management system to a year 2000 ready version. Amtrak staff have prepared a questionnaire for Amtrak's major material suppliers to ascertain their systems' readiness for the year 2000. Finally, Amtrak's Finance and Human Resources departments have begun soliciting bids for a replacement Payroll/Personnel system.

In summary, Amtrak has a well-established year 2000 project for readying its application systems for the year 2000 calendar change over. Amtrak employees are collaborating with expert consultants on the year 2000 software conversion to ensure that Amtrak's application systems are ready for the transition to the year 2000. Additionally, Amtrak was pleased to attend the Federal Railroad Administration's (FRA) Year 2000 Railroad Industry Workshop on July 20, 1998, and Amtrak has been apprising the FRA of its progress.

Finally, Amtrak's Inspector General, Assistant Chief Engineer, and ITSC are coordinating their year 2000 efforts through the sharing of information on their year 2000 conversion activities. Attached is a table detailing the conversion progress of Amtrak's application systems (Attachment A) and a chronology outlining the steps Amtrak has taken to ready itself for the year 2000 calendar change over (Attachment B).

Again, thank you for the opportunity to submit this testimony.

ATTACHMENT A.— APPLICATION SYSTEMS CONVERSION PROGRESS SUMMARY

Description	Start date	End date	Comments
Inventory and Assessment	March 1997	September 1997	5 million lines of code, year 2000 date impact is 70%.
Mainframe computer Hardware/Systems Software upgrade.	June 1997	October 1998	Systems and application testing in progress.
Pilot Project	October 1997	May 1998	Conversion and acceptance testing completed.
Reservation System (ARROW).	October 1997	January 1999	Testing of infrastructure and applications in progress.
Revenue Management Application Systems.	March 1998	December 1998	Project on schedule and within budget, year 2000 testing started.
Financial/Accounting Systems.	March 1998	January 1999	Conversion program code is proceeding on schedule.
Labor Systems	April 1998	March 1999	Code analysis in progress.
Operations & Safety	March 1998	May 1999	Contacting vendors, embedded systems testing in progress.
Business Partners	February 1997	May 1999	Validation/Testing of systems, replacement of Amtrak Materials System.
Amtrak Information Network.	September 1997	February 1998	The analysis and testing of network components is in progress.

ATTACHMENT B.—CHRONOLOGY

- October 1996—Amtrak Management allocates funds for a year 2000 assessment and legacy system inventory.
- January 1997—a full time director level position is appointed and begins staffing the project team for the year 2000 remediation project.
- March 1997—contracted with Bedford Associates, an expert reservation systems service provider, to complete the assessment for ARROW, Amtrak's Reservation System. The assessment and inventory was completed June 1997 and revealed that out of 5,000 programs only 9 programs required modifications.
- May 1997—through the competitive bidding process Information Management Resources, Inc. (IMR) is selected to complete the year 2000 application assessment for the Amtrak business systems. The project is completed ahead of schedule by September 1997.
- June 1997—existing mainframe computers are scheduled for an upgrade to year 2000 ready computer hardware and operating systems software, including related sub-systems, i.e. DB2, CICS. Installation of computer hardware and systems software has been completed. Testing of the operating systems software with the application systems is in progress for a targeted completion of October 1998.
- September 1997—planning for the computer resources required for changing and testing of the 5 million lines of application code begin. The computer hardware and software is ready for application remediation and testing by February 1998.
- October 1997—Amtrak management approves two-year budget for the year 2000 modifications (remediation) of the mainframe legacy application systems. The project is proceeding on plan and remains within budget.
- October 1997—qualification of vendors through the competitive bidding process for the year 2000 modifications of the application code affected by the year 2000-date change begins.
- October 1997—IMR is selected to make the Travel Agency Processing System ready for the year 2000 date change. This application was selected as a pilot project to solidify the year 2000 renovation processes. Renovation of 400,000 lines of code is complete in May 1998. The Travel Agency Processing System is ready for the year 2000-date change.
- January 1998—Inspector General is briefed on the Year 2000 project.
- February 1998—began soliciting information from various Amtrak departments on their state of readiness for the year 2000 calendar. Action items for the affected systems have been identified and progress is monitored.
- March 1998—IMR and IBM are selected to convert the application systems for the year 2000-date change. Both vendors start the remediation, which is progressing according to the project plans.
- July 1998—Year 2000 Project Office centralizes coordination of all Year 2000 project activities at Amtrak. Information Technology (ITSC), Inspector General

and Assistant Chief Engineer meet to coordinate year 2000 activities to assure that safety and operational concerns are remedied as required for the year 2000 calendar change, including embedded systems and links to business partners.

—July 1998—attended year 2000 meeting chaired by the FRA Deputy Administrator. Panel discussion by representatives of class 1 railroads on year 2000 Awareness, Assessment, Renovation Validation and Implementation.

