
TRANSPORTATION

OVERVIEW

The transportation sector is a complex and diverse mixture of public and private enterprises. This sector includes three divisions: aviation, surface transportation and maritime

entities. Within each division, distinct "modes" exist. For example, railroads and trucking are both surface modes, but are separate industries in their own right. To keep the scope of the Committee's investigation manageable, the Committee selected areas having a major impact on public safety or the nation's economy. Y2K problems may also exist in areas not covered in this investigation.

Transportation and Y2K Issues

In pursuing this investigation, the Committee staff conducted interviews with a wide variety of knowledgeable parties including: federal agencies that regulate and provide services to transportation system operators, system operators themselves, associations representing a broad cross-section of the industry, equipment manufacturers and facility operators (e.g. airports and ports). A complete list of organizations interviewed is appended to this section.

Like most other sectors of the economy, transportation has become highly automated and dependent on information technology to transport people and goods safely, quickly, and economically. However, such automation has made this sector vulnerable to Y2K concerns and issues

seen in other sectors by the Committee. These include obtaining assurance of Government services such as air-traffic control and customs processing, wide variations in

individual firms' Y2K preparedness, a profusion of rumors and misinformation, and a general uncertainty about the risk presented by embedded microchips. In addition, the transportation sector raises many concerns about international Y2K preparations. These included the Y2K readiness of international air traffic control, non-U.S. airports, and non-U.S. ports, all of which affect U.S. travelers, businesses, and consumers.

The Committee has found that all the major transportation players—the biggest operators, the largest facilities, the federal agencies, etc.—have substantial Y2K programs underway. In all these programs, the emphasis is first on safety. All of these entities are well on the way to being 'Y2K ready' on their own. In addition,

YEAR 2000 MALFUNCTIONS IN TRANSPORTATION ARE AT THEIR BEST AN INCONVENIENCE, BUT THEY MUST NOT AND CANNOT PUT OUR CITIZENS AT RISK.

**SENATOR CHRIS DODD
SEPTEMBER, 1998**

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parties show a willingness to cooperate with each other in transportation: large airports have reached out to smaller feeder airports and railroads have shared information about Y2K problems. However, there is reason to be concerned about the readiness of smaller players in this sector, as has been the case in other sectors. For example, there are thousands of city and county governments in the U.S. that are responsible for operating and maintaining the local surface transportation infrastructure. The Y2K planning of these governmental entities has been very slow. A good example is highlighted by the September 1998 survey from the comptroller of the state of New York, who found that a disturbingly large number of cities, towns and villages in that state had not, at that time, made any assessment or planning for the Y2K problem.

MAJOR INITIATIVES

GAO Airport Survey

Airports are a critical component of U.S. aviation operations, often referred to as the National Airspace System (NAS). Airports are the entry and exit points to the NAS for most travelers. While much attention has been centered on the Federal Aviation Administration's ability to guarantee that its air traffic control

system will continue to operate safely and efficiently during and after the millennium date change, less attention has been focused on the readiness of the nation's airports.

The Senate Committee on Commerce, Science and Transportation has requested the U.S. General Accounting Office (GAO) to review the Y2K status of the systems and equipment integral to the operation of the nation's airports. At issue are systems for lighting

runways, controlling access to secured areas, handling baggage and fueling aircraft. Breakdowns in these vital systems could disrupt an airport's ability to move aircraft and travelers efficiently and safely and could ripple throughout the entire NAS, thus creating system gridlock.

As part of its review, GAO is surveying more than 400 of the nation's airports to determine progress made toward ensuring that operations will not be seriously affected by Y2K malfunctions. The specific research questions guiding this review are:

- How will the safety, security and efficiency of the NAS be affected if the airports' Y2K preparations are not adequate?
- What conditions will affect the outcome of airports' Y2K preparations?
- What progress have airports made to ensure that their computers and electronic equip-

Highlights of U.S. Aviation

- 13 major U.S. airlines
- 34 national airlines
- 52 regional airlines
- 670 certified airports
- 550 million annual U.S. passengers
- \$100 billion total operating revenues

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ment will function on and after January 1, 2000?

The survey data will be supplemented with site visits to a cross-section of airports in order to gather more in-depth knowledge of the challenges faced by airport managers. The report is expected to be available in February 1999.

IATA Survey

The International Air Transport Association (IATA) is the major body for coordinating interairline cooperation. It currently has 260 member airlines from over 130 nations. IATA has been working with its members since 1996 to cope with the millennium bug. IATA members are spending over \$1.6 billion to resolve Y2K problems internally.

In 1997, IATA released a survey of 44 of its member airlines on their Y2K preparations and concerns. This survey revealed that 61% of the airlines participating in the survey rated the Y2K problem critical to the industry and another 32% rated it fairly serious. IATA's next initiative has focused on airports around the world. IATA has targeted 100% of the international airports and Air Traffic System (ATS) providers outside of North America and used by IATA members. Although IATA is keeping its survey results private to its member companies, and the public will not be privy to its survey results, the comprehensiveness of

IATA's membership should provide reasonable assurance that an airline will not be flying unknowingly into a non-compliant airport in January 2000.

ICAO Status Tracking

The International Civil Aviation Organization (ICAO) was established in

1947 *"in order that international civil aviation may be developed in a safe and orderly manner and that international air transport services may*

be established on the basis of equality of opportunity and operated soundly and economically." In the same year, ICAO became a specialized agency of the United Nations. ICAO now encompasses 185 nations. In an effort to ensure that worldwide air traffic control and international airport operators are fully aware of the scope of the Y2K problem, ICAO has developed an action plan that it is currently implementing. To date, three ICAO "state letters" (advisory letters to member countries) have been distributed: the first on December 1997, the second in May 1998 and the last in November 1998. This is part of an ongoing effort to alert ICAO contracting states to the extent of the problem, to inform them of action being taken by ICAO and to request additional information.

| <i>Railroad Highlights</i> |
|--------------------------------------|
| -Over 700 U.S. Railroads |
| -Over 220,000 miles of track |
| -20,000 locomotives |
| -\$32.7 billion in operating revenue |
| -Over 265,000 employees |
| -20 million intercity passengers |
| -48 million commuter passengers |

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While ICAO has no regulatory authority over its member states, it does serve as an adviser to the air-traveling public. In this capacity, ICAO had said that it would publish "status reports on the progress among States in order to provide confidence to the travelling public and aircraft operators." However, ICAO has at this time dropped its plans to publish these assessment reports.

Trucking Industry Highlights

-84,212 fleets of 10 or more trucks
-9.5 million people employed in trucking
-\$346 billion in gross revenues
-Serves every U.S. community
-77% of all communities rely solely on trucking
-\$27 billion paid in highway taxes

cluded both their computer systems (often referred to as Information Technology or IT) and embedded systems, such as controllers integrated into transportation vehicles or facility control and monitoring systems. In order to facilitate honest and candid answers to survey questions, respondents were given a pledge of confidentiality. Significant items learned from the survey include:

ASSESSMENTS

Transportation sector survey conducted by Committee staff.

In preparation for the September 10, 1998 hearing on transportation-related Y2K issues, the staff of the Special Committee on the Year 2000 Technology Problem conducted a survey of large companies and service providers in the transportation sector. The results of this survey are summarized in a table attached to this section.

To sample the transportation sector, representatives were selected from major airlines, airports, railroads, maritime shippers, trucking companies and metropolitan transit authorities. The Committee staff asked survey respondents for information on their automated systems used to manage and operate their respective transportation systems. This in-

- 62% of the respondents reported that they had not completed their Y2K assessment process. This is disturbing given the short time remaining until December 31, 1999. By comparison, the Office of Management and Budget directed all Federal agencies to complete their assessments by June 1997.
- Six of the eight who answered a question on mission critical systems reported that 70% or more of their systems are mission critical.
- 100% of the respondents reported that their contingency plans are incomplete. Even more disturbing, over half reported that they were not even working on contingency plans at this time.
- 94% reported their total expected Y2K expenditures. The total

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projected cumulative costs at this time are over \$650 million.

- 50% of the respondents reported they anticipated being involved in litigation due to the Y2K problem.
- 94% 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.

Other studies have concluded that medium and small enterprises are not as advanced in their Y2K preparedness as their larger counterparts. Hence, since this study focused on large transportation firms, the results presented here probably represent the best-prepared portion of the industry.

The survey raises many concerns about aviation given the disproportionately poor response rate to the survey of 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 jetliners convincing. Planes will not literally "drop out of the sky" on January 1, 2000. But, if the ground-based information systems support-

ing 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 dissatis-

faction 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 are making the best progress on their mainframe and client-server applications and are furthest behind on the embedded chip assessment and remediation aspects of the problem.

Costs varied widely across survey responses. In an attempt to explain this disparity, the Committee found a marked lack of uniform accounting for Y2K expenditures.

A little more than half the surveyed parties were worried about becoming party to litigation brought by Y2K failures or upsets. Still more had concerns about the potential for business partners to fail to deliver expected products or services. Others felt that they could plan for these contingencies.

Organizations were also asked what Congress could do to facilitate Y2K efforts in the transportation sector.

Public Transit Highlights

-6,000 U.S. transit agencies
-\$7 billion in annual capital expenses
-\$19 billion in annual operating expenses
-8 billion trips annually
-3.7 billion miles and 246 million hours of annual service
-300,000 employees

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By far, the most common answer (from about 50% of respondents), was to produce 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) antitrust 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 industries, such as power utilities and telecommunications.

ATA Survey

The Air Transportation Association (ATA) is the sole trade organization of the U.S. major airlines. The 28 members include all the large U.S. passenger and cargo airlines as well as associate members from Canada, Mexico and Holland. ATA members collectively transport over 95% of all air passengers and cargo in the U.S.

After concern was raised about airports by early surveys and the airlines, ATA has focused an initiative on domestic airports. To date, it has completed 158 awareness and assessment visits in coordination with the Airports Council International and

the FAA. In addition, Y2K planning kits have been sent to over 400 airports that the ATA team could not visit.

Testing for Y2K readiness is either underway or soon to begin with the Dallas-Fort Worth Airport, the Seattle-Tacoma Airport and United Airlines. Results of ATA activity and testing were not available at the time of this

report, but a major readiness announcement is expected from the FAA, ATA and several airlines in the early part of 1999.

Two major issues have been raised in the airport assessments. The first is that airports are often bound by many cumbersome rules when acquiring equipment or services. These rules can be loosened during emergencies and the Committee feels that the FAA, the airports and governing authorities should begin looking at Y2K as an emergency and expedite airport remediation procurements. The second issue is the disparate nature of airport oversight and funding. This unfortunately means that no one general program will work for all airports and Y2K programs will have to be tailored to the specifics of an individual airport.

Maritime Highlights

The port industry, port users and capital expenditures for maritime equipment provides:

- 16 million jobs nationwide
- \$154 billion in Federal taxes
- \$783 billion of GDP
- 70% of U.S. Customs revenues

CONCERNS

General Concerns

Several general concerns were raised by parties interviewed for this sector including domestic and foreign partner readiness, and federal government readiness. Examples of the first category include airline concerns about airports and airport concerns about jet fuel pipelines. In the second case, the most common concerns were about the Y2K readiness of the FAA's Air Traffic Control systems and U.S. Customs Service's automated import and export systems. The Committee staff met with the General Accounting Office and the Department of Transportation Inspector General on the FAA's Y2K progress and came away with the general sense that the FAA is making substantial progress but still has significant challenges ahead. The Committee also interviewed the U.S. Customs Service on its Y2K preparations. The material presented showed that they were making very good progress in bringing into compliance its "Automated Commercial System," which clears and tracks imports and exports, Y2K compliant.

Aviation-Specific Y2K Issues

Aviation is by far the most complex and automated transportation sector. In the words of one interviewee, "Airlines and airports along with FAA and air traffic service providers rely heavily on Y2K infested technology" and "If today were January 1, 2000, the world's airline system would fail."

The major airlines interviewed have substantial Y2K programs and seem to be making significant progress with domestic air operational readiness. However, they expressed concerns about FAA Y2K readiness. Although the airlines stated that the FAA is moving much more deliberately now than a year ago, the airlines are concerned that the FAA still has a long way to go. One airline, which reported doing an independent assessment, said it was satisfied with the validity of the recent FAA announcement that the very important "HOST" computer for the enroute air traffic control centers was not Y2K vulnerable.

However, GAO testified before Congress as recently as August 6, 1998 that the FAA will not be fully ready by January 1, 2000. Significant risks in the FAA remediation program cited by the GAO included:

- Ineffective management of external data exchange analysis and remediation efforts. As of August 6, 1998 half the exchanges were still not examined for date sensitive data; of the 25% found to have date sensitive data, over 90% of those needed repairs.
- Poor coordination to date on international air transportation issues.
- Reliance on a telecommunications infrastructure that is not totally within its control and may not be renovated on time.
- Missteps in business continuity and contingency planning. The National Air Traffic Controller's Association (NATCA) has criticized the current version of

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FAA's plans for being ambiguous in responding to outages of critical facilities. The FAA testified at the August 6, 1998 hearing that finalized contingency plans would be available by August 31, 1998, but that date slipped at first until September 30 and then slipped again. At the time of this report, only a draft version of the FAA's Y2K contingency plan is believed to exist and it has not been widely distributed in the aviation community or seen by the Senate Committee.

Airlines can be affected by Y2K in a number of ways other than the loss of Air Traffic Control (ATC). They are heavily dependent on scheduling programs for aircraft, crews and reservations. The aircraft themselves must be flight ready. Airport facilities under their control must be compliant. Moreover, external utilities (e.g., electric power, telecommunications and aviation fuel) must be available. However, the major airlines interviewed by the Committee appear to be managing their internal Y2K preparations well and are surveying their external providers (e.g., foreign airports) for the purpose of developing contingency and business continuity plans.

Airports have many dependencies on information technology that may be Y2K vulnerable. Areas that must be assessed include runway lighting systems and jetway security systems. One airport official has claimed that only one pipeline, originating in Houston, Texas, supplies aviation fuel to most of the airports on the eastern seaboard. If this

pipeline were to fail on January 1, 2000, the airports in New York could only operate for four to seven days with the fuel supply on hand. Two surveys are underway on airport readiness: the ATA is surveying domestic airports and the IATA is covering airports abroad. Preliminary information from the ongoing ATA survey indicates that 38% of the 63 airports surveyed do not have a Y2K plan. In addition, concerned U.S. airlines are individually raising Y2K awareness on their initiative because of the late start that IATA had in its efforts.

Concerning aircraft, the Committee interviewed the Boeing Commercial Aircraft Group (BCAG) that provides the preponderance of planes to U.S. carriers. Boeing has done a thorough analysis of all makes and models of Boeing aircraft and aircraft from the recently acquired McDonnell Douglas Corporation (maker of models such as the DC-9s and MD-11s). BCAG contends that a few minor "nuisance" vulnerabilities have been detected in Flight Management Systems on older aircraft. However, the most recent models are all Y2K ready. Boeing has issued service bulletins and service letters on these nuisance factors. Hardware and/or software upgrades are available. In addition, BCAG maintains that these problems will in no way impact the air-worthiness of the aircraft. The Committee staff received the same information from an independent and credible source during a subsequent interview with a major U.S. carrier.

Y2K Issues in Other Transportation Areas

Railroads

Railroads (long haul and short haul) appear to have fewer Y2K transportation equipment problems. As with other large businesses, major internal business systems have to be analyzed and fixed. Concerning operational safety, the short haul railroads have little automation and believe they will not be affected by the century date change. The major railroads interviewed have ongoing Y2K programs and are fixing problems. The most commonly cited operational problem is in train dispatching software, but the Committee staff was informed that even if all of this software were not repaired, the outcome would pose a capacity problem, but not a safety concern.

In earlier testimony before the Senate Banking Committee, it was reported that virtually none of the existing railroad switches are manually switchable. The witness contended that the railroad switches are fully automated and controlled by embedded chips, which are likely to pose substantial Y2K problems. The threat this could pose to economic stability in the U.S. is disconcerting. However, it is the propose of this report to identify and debunk myths like that of the automated railroad switches with embedded chips. As the Committee has learned, concerns about automated railroad switches and signaling systems appear to be ill founded. The Committee staff heard from multiple sources that essentially all automated

switches have manual overrides (no source could identify one which didn't). Concerning signaling and warning systems, there didn't appear to be any date-dependent functions that would interfere with their safe operations. These devices are event driven, not date or time dependent. Even in the unlikely event of a Y2K-related failure in this equipment (e.g., a power outage), work-around procedures are in place for continued safe operation of the railroad, although with diminished capacity.

Maritime Transportation

Y2K awareness within the maritime community is low to moderate. Maritime cargo shipping (containerized, bulk, tanker, etc.) is somewhat unique from other transportation modes in that each ship is virtually custom built. Thus, each must be individually inventoried and assessed for Y2K problems. Maritime shipping operational safety is at greatest risk during entry and exit from ports. To avoid increasing that risk due to possible Y2K problems, the concept of keeping ships from entering and exiting ports during the change of century is being considered by shipping operators. If Y2K prevents ports from operating for a lengthy period, there will be a high economic cost to U.S. companies. However, given that the millennium change will occur on New Year's Eve, a short "stand down" period will have minimal economic impact. Due to the long lifecycle of ships, major maritime shipping companies' ship inventories often include a variety of ages and automation among ships.

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Committee investigation into concerns about the automation of oil tankers did not yield any major Y2K-related safety or environmental issues. There is a large amount of embedded chip technology in material handling equipment at ports. However, assessments of that equipment is still incomplete and it is too early to identify significant issues. Along with revenue systems, cargo tracking, maintenance and scheduling systems are a major concern, since most use commercial, off-the-shelf (COTS) software. Finally, interviewees did not have an accurate sense of the status of international ports. However, it is widely believed that they are far behind in their Y2K efforts. While Y2K impacts on the maritime industry may potentially interrupt commerce, safety is less an issue than in some other industries.

Trucking

There are over 400,000 trucking companies registered with department of motor vehicle agencies in the United States. Eighty percent of these employ fewer than 20 trucks within their operations. The American Trucking Association represents approximately 45,000 individual trucking companies. The trucking industry has become increasingly more reliant on information technology and electronic data interchange in the everyday conduct of business transactions. The process of just-in-time inventory management has drastically reduced reliance on long-term warehouse storage. Consequently, trucking companies have in a sense become mobile warehouses

that rely on a dependable stream of up-to-date information in order to effectively service customers.

The trucking industry has become highly time sensitive and uses a sophisticated level of computer software to manage its workload. The load management systems of these companies involve the transfer of electronic data between shippers, brokers, merchants and the trucking companies. This includes transmission of shipping status notices, bills of lading and payment forms. Industry automation extends to advanced on-board vehicle systems that enable a company to remotely monitor a truck's engine performance and speed, and global positioning systems that track a truck's location. Computer technology is also used in advanced weigh-in-motion devices, inspection systems and safety record databases.

Public Transit

In the Public Transit area, the Committee staff interviewed the Washington, DC and New York Metropolitan Transit Authorities and the American Public Transit Association (APTA). The Washington MTA program started late and is only in its initial phases. The New York program started much earlier. New York's size creates a challenge, but it also benefits from a much less automated and therefore less Y2K vulnerable system. Finally, APTA has surveyed about 364 of its members. The response rate was about 50%. To quote from the report:

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“... further examination of the data reveals conflicting responses. This raises concern about the ability of transit systems in dealing with Year 2000 issues and their under estimation of Year 2000 problems.”

Conclusions

The transportation sector is the life-blood of our modern economy. Daily, it provides millions of Americans and American businesses with safe, rapid and economical transport of their people and goods. It has been working so well and efficiently that it has turned boats, trucks, trains and even planes into mobile warehouses that efficiently deliver goods to factories and customers on a just-in-time basis.

Segments of the transportation sector work hand in hand as goods and people transfer from one mode to another. This coupling of modes allows the best mode to be used at any given time, but it creates a dependency linkage that leaves the whole system vulnerable if just one link goes down. Thus it is important that all major segments of transportation be Y2K ready at the same time

if the sector is going to maintain its productivity after January 1, 2000.

The most disturbing findings in this sector that the Committee has found are:

- Domestic airports have (on average) started very late to get ready for Y2K.
- The FAA, although it has made great strides in the past year, has a long way to go to be ready for Y2K and remains a high risk.
- The situation with international air traffic control and airports is much worse than in the U.S. and some level of flight rationing is highly possible for some foreign destinations.
- The maritime shipping industry has not moved aggressively on Y2K. Disruptions to global trade are highly likely.
- Public transit systems may not be taking the Y2K problem seriously enough to be ready for the Year 2000.

TRANSPORTATION SECTOR INTERVIEWS

Transportation Sector Overall

Department of Transportation (DOT)
Inspector General's Office
U.S. Customs Service (Treasury)
MITRE Corporation

Aviation in General

General Accounting Office
Federal Aviation Administration (DOT)
IBM

Airport representatives

American Ass'n of Airport Executives
Seattle-Tacoma Airport Authority
Dallas-Fort Worth Airport Authority
New York-New Jersey Port Authority
Airports Council International

Airlines representatives

Air Transport Association (ATA)
International Air Transport Association
American Airlines
SABRE Technology Solutions
United Airlines
Delta Airlines

Aviation manufacturers

Boeing Commercial Aircraft

Railroads

Federal Railroad Administration (DOT)
Association of American Railroads
American Shortline Railroad Association
CSX
Amtrak
Burlington Northern-Santa Fe

Shipping

Maritime Administration (DOT)
U.S. Coast Guard (DOT)
American Association of Port Authorities
Officials
Crowley Maritime
Sea Land (CSX)
Chevron
New York/New Jersey Port Authority

Trucking & Highways

Intelligent Transportation Society
American Trucking Association
American Association of State Highway
and Transportation Officials
Federal Highway Administration (DOT)
New York/New Jersey Port Authority
Schneider National

Mass Transit Agencies

Washington MTA
American Public Transit Association
New York MTA

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TRANSPORTATION SECTOR SURVEY CONDUCTED BY YEAR 2000 SPECIAL COMMITTEE STAFF

| Company Type | Date Aware of Y2K Problems | Date Formal Project Started | Is Your Assessment Complete | Percent Systems Mission Critical | Contacted Service Providers/Vendors | * Legal or Liability Concerns | Contingency Plans Complete | Contacted by Creditors | Contacted by Investors | Will You Finish In Time |
|----------------------|----------------------------|-----------------------------|-----------------------------|----------------------------------|-------------------------------------|-------------------------------|----------------------------|------------------------|------------------------|-------------------------|
| 1 Airline | 1995 | 1995 | N | NR | Y | Y | N | Y | Y | Y |
| 2 Airline | 1995 | 1995 | N | 75% IT 38%emb | Y | Y | N | Y | Y | Y |
| 3 Airline | 1995 | 1996 | Y | 30% | Y | N | N | Y | Y | Y |
| 4 Airport | 1996 | 1996 | N | 70% | Y | Y | N | N | N | Y |
| 5 Railroad | 1995 | 1995 | N | NR | Y | Y | N | Y | Y | MC only |
| 6 Railroad | 1996 | 1997 | N | NR | Y | N | N | Y | N | Y |
| 7 Railroad | early 90's | NR | Y | NR | Y | N | N | Y | Y | Y |
| 8 Railroad | 1994 | 1995 | Y | NR | Y | N | N | Y | N | Y |
| 9 Shipping | 1995 | 1996 | Y | 100% IT ?% emb. | Y | Y | N | Y | N | Y |
| 10 Shipping | 1996 | 1996 | Y | 85% | Y | Y | N | N | N | Y |
| 11 Transit Authority | 1995 | 1995 | N | 75% | Y | Y | N | Y | Y | Y |
| 12 Trucking | 1995 | 1995 | 70% | Unknown | Y | N | N | Y | Y | Y |
| 13 Trucking | 1995 | 1995 | N | NR | Y | Y | N | NR | N | Y |
| 14 Trucking | 1995 | 1995 | Y | NR | Y | Y | N | Y | N | Y |
| 15 Trucking | 1994 | NR | N | 75% | Y | N | N | N | N | Y |
| 16 Trucking | 1996 | NR | N | 30% | Y | N | N | N | N | Y |

Notes:

- * Respondents were asked about potential Y2K legal exposure caused by vendor/supplier failure. Some respondents chose to answer more generally about their overall legal exposure.
- MC = Mission Critical, NR = No Reply, IT = Information Technology (systems), emb. = Embedded (systems)
- For the 15 companies that reported their costs, they project to spend over \$650 collectively on Y2K.