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1995

Transportation Industry

Forecast Update

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INPUT Worldwide

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Germany
Tel. +49 6403-911-420
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London
Cornwall House
55-77 High Street
Slough, Berkshire
SL1 1DZ, England
Tel. +44 (0) 1753 530444
Fax +44 (0) 1753 577311

New York
400 Frank W. Burr Blvd.
Teaneck, NJ 07666
U.S.A.
Tel. 1 (201) 801-0050
Fax 1 (201) 801-0441

Paris
24, avenue du Recteur Poincaré
75016 Paris
France
Tel. +33 (1) 46 47 65 65
Fax +33 (1) 46 47 69 50

San Francisco
1881 Landings Drive
Mountain View
CA 94043-0848
U.S.A.
Tel. 1 (415) 961-3300
Fax 1 (415) 961-3966

Tokyo
Saida Building, 4-6,
Kanda Sakuma-cho
Chiyoda-ku, Tokyo 101
Japan
Tel. +81 3 3864-0531
Fax +81 3 3864-4114

Washington, D.C.
1921 Gallows Road
Suite 250
Vienna, VA 22182-3900
U.S.A.
Tel. 1 (703) 847-6870
Fax 1 (703) 847-6872

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U.S. Information Services Market Analysis Program

Transportation Industry

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Abstract

This forecast update examines the events, trends and issues that will have an impact on the transportation industry and the vendors that supply information services to the sector. The report also presents a forecast of the purchase of these services for the period 1995 to 2000.

The report analyzes and forecasts the transportation market for information services for product/service markets consisting of professional services, systems integration, outsourcing, processing services, network services, applications software and turnkey systems.

Issues, trends and other factors affecting the transportation industry are discussed and analyzed from the perspective of users and vendors to identify possible opportunities for needs to be met. Some of the key topics discussed in this study include the information systems environment, the impact of technologies such as EDI, automated identification and related areas on the transportation sector, business issues faced by the industry and its growing emphasis on customer service, and the expanding role of information services.

The analysis of the industry and technology trends and issues, along with other research, is used to project the growth in the transportation market for information services over the next five years—1995 to 2000. The forecast update report contains 42 pages and 9 exhibits.

Table of Contents

Exhibits

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Introduction

A
Report Purpose and Methodology

This section identifies the purpose and scope of this report and explains INPUT's research methodology and techniques used in the preparation of the forecast data.

1. Purpose

The purpose of this industry forecast report is to describe the evolving transportation services industry, identify the key factors by product/service categories and provide the 1995 INPUT forecast for information services in major segments of this industry.

Industry Definition—The transportation industry comprises all service businesses that are involved in the movement of goods and people. It is not a single industry, but rather a group of competing industries separated by mode of transport, i.e., airlines, railroads, trucking and water transport.

INPUT believes that understanding the issues confronted by the industry and its underlying sectors is essential for understanding their information services direction. With this understanding, appropriate market strategies for the focused information services vendor become clearer.

2. Methodology

This report is based on data gathered during 1994 and the first half of 1995 as part of INPUT's ongoing market analysis program. Trends, markets sizes and growth rates are based upon INPUT research and in-depth interviews with users in the transportation services industry, as well as IS vendors serving the industry.

This report made extensive use of INPUT's corporate library located in Mountain View, California. The resources in this library include on-line periodical databases, subscriptions to a broad range of computer and general business periodicals and continually updated files on more than 3,000 information services vendors.

Please note that vendors may be unwilling to provide detailed revenue breakouts by product/service market or industry. Also, vendors often use different industry categories or industry segments, or put their services into different modes from those used by INPUT. Thus, INPUT must estimate revenues for these categories on a best-effort basis. For this reason, the product/service market and individual segment forecasts should be viewed as indicators of general patterns and trends rather than specific, detailed estimates for individual years.

B
Contents and Organization

In addition to this introductory chapter, this report contains analyses of the industry and information services market as described below:

Chapter II, Trends, Events and Issues, gives a general business overview and discusses changes, market issues and activities, and competitive factors in the transportation industry and specific segments. These can have an impact on the current and future use of information services.

Chapter III, Market Forecast, discusses the sector's overall information systems environment, and gives a market overview and INPUT's analysis of expenditures for information services by product/service market categories and submarket for the U.S. transportation services market and, where applicable, by transportation segment. The chapter also discusses various recent technology activities within the segments of the transportation industry. The chapter concludes with INPUT's analysis and recommendations for the transportation technology market.

Appendix A contains the Forecast Database, presenting a detailed forecast by product/service market and submarket for the transportation industry vertical market. It also contains a forecast reconciliation of INPUT's 1995 forecast for the transportation sector with the 1994 forecast.

C
Related INPUT Reports

Related INPUT reports are available through INPUT's various programs.

Market Analysis Program:

U.S. Professional Services Market Analysis Report
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Electronic Commerce Program:

Electronic Commerce: Comprehensive Market Assessment
Electronic Commerce in Trade and Transportation

Vendor Analysis Program:

Vendor profiles are available for the leading information services vendors that serve the transportation industry.

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Events, Trends and Issues

A
General Business Overview

As documented by the U.S. Department of Commerce, economists and business journals, the U.S. economy ended 1994 on a high note, with annual growth at approximately 4.6%. Since employment has also returned to an acceptable level, there is some concern that the strong growth increases the threat of inflation in 1995. However, January's gain in employment—134,000 people—was well below 1994's monthly average gain of 290,000. This decrease has generally been regarded by both economists and financial analysts as the first solid evidence of slower growth. Most economic observers now believe that growth will slow to around 2% by the third quarter of 1995, giving the American economy what some economists call a "soft landing." Economic analysts also agree that the economy seems to be in a mid-cycle slowdown, and that the long-term risk of the slowdown becoming another period of recession in late 1995 is low.

From a financial markets viewpoint, in 1994 bond yields rose nearly 200 basis points, and the Federal Funds rate was up 250 basis points. In 1995, analysts expect the Fed rate to top out at 6.0% (which it has—see below), bond yields to move sideways and S&P 500 earnings to increase approximately 7%—a smaller amount than in 1994. In general, most sectors of the U.S. economy should grow more slowly in 1995 than they did in 1994—the result of slight decreases in productivity and price/cost pressures. U.S. manufacturers are still restructuring, emphasizing cost-cutting and downsizing. With the early-1995 weakness of the dollar (especially against the yen), world markets should find U.S. goods attractively priced. Imponderables remain the short-term impact of support for Mexico's peso and trade disputes with China and Japan. These situations have the potential for significant short-term volatility, but in the long run should have little effect on the U.S. economy's return

to modest, steady growth. Inflation in 1995, as measured by the *Blue Chip* consensus of approximately 50 private-sector economists, is expected to be at a conservative 2.9%, growing slightly through the year 2000 to a maximum of 3.3% during 1996 and 1997, declining to 3.0 % by the millennium.

In support of the long-term economic theories summarized above, the most encouraging (and pragmatic) sign of a healthy economy was seen on July 7, 1995, when, after a prolonged period of rate increases dating back to early 1994, the Federal Reserve lowered the Federal Fund rate by 1/4% —from 6% to 5.75%. The amount of adjustment is small, but the direction of the move is seen by most financial and business analysts as extremely positive, and a signal that the economy has stabilized and that inflationary influences are now under control.

Overall, however, the outlook for the U.S. economy in 1995 is for controlled, steady growth in the 5.7% range, with inflation at about 3%, and corporate after-tax profits at approximately 7%, down slightly from 10% in 1994.

B
Industry Events, Trends, and Issues

Transportation is a service industry involved in the movement of goods (raw materials, parts and finished products) and people. Beyond automobile travel, transportation companies are primarily business support entities. The transportation sector expands to support growth in the volume of goods or travelers to be moved. Both are generally driven by factors that are not within the control of the transportation industry.

This section discusses the mode-based industries separated by the basic distinction of people and goods. The keys for selection among the various modes are price, service and timeliness. Collectively, the transportation system is an economic enabler. However, the reverse is also true; the continued sluggishness of global economic growth has affected the financial results of the transportation industry sector.

1. Events

The U.S. economy continues to recover; 1994 was a better year for the transportation industry. The U.S. airlines, hit by major financial losses that began in 1990, posted profits, and at the end of 1994 there was not a single major airline operating under bankruptcy protection. Railroads were profitable in 1994 for both passenger and freight traffic. Intermodal

transport got a boost with the passage of the Teamster contract in 1994. Overall, there were several mergers and acquisitions that occurred during 1994. Until recently, many firms preferred to grow internally, but now the industry is seeing a heightened pace of consolidation, as even the small economies of scale derived through mergers are sufficient to give firms a competitive edge.

a. Passenger Carriers

The total number of domestic intercity passengers increased by 18% between 1980 and 1993 (946 million to 1,116 million). In 1993, the number of passengers was virtually unchanged from 1992, posting only a 0.5% increase.

During 1993, there was an increase of 2% in the number of air passengers carried (436 million to 445 million), whereas the number of bus passengers dropped 2.3% (339 million to 331 million). Rail passengers rose 1.5% (314 million to 318 million) overall, 4.2% for Amtrak and 1.3% for commuter rail.

Exhibit II-1 compares the breakdown by mode of travel for intercity passengers for 1980, 1985, 1990 and 1993.

Exhibit II-1

Domestic Intercity Passengers by Mode of Travel, 1980-1993

Mode	1980 (Percent)	1985 (Percent)	1990 (Percent)	1993 (Percent)
Air	29.1	36.1	38.5	39.8
Amtrak	2.2	2.0	2.0	2.0
Commutation	29.6	27.3	29.5	28.5
Bus	39.1	34.6	30.0	29.7

Source: Transportation in America, 1994

i. Airlines

Persistence seems to be paying off for the troubled airline industry. Although the growing U.S. economy gave air traffic a boost in 1994, the profits posted by the major airlines were largely due to the industry's efforts to bring operating costs in line with revenues. Airline capacity was down as carriers retired planes, reduced hubs and canceled airline orders. Several cost-cutting measures were implemented during 1994. July 1994 saw a $5 billion employee buyout at United Airlines.

Moreover, carriers strove to negotiate better union agreements and establish more reasonable yield patterns. American Airlines and USAir are seeking concessions from pilot unions.

Fuel prices are expected to rise in 1995. This could pare down profits, but airline executives believe that the Republican-controlled Congress will rescue the industry by introducing tax cuts.

Market share concentration continues to be a major airline industry factor. Exhibit II-2, below, compares the relative market shares based upon revenues for the major players in 1994 and 1991.

Exhibit II-2

Airline Concentration in Market Share

Carrier	1994 (Percent)	1991 (Percent)
American	22.5	20.2
United	20.3	18.7
Delta	17.6	16.8
Northwest	13.0	12.4
Continental	8.1	9.7
USAir	10.2	8.0
TWA	N/A	6.7
Southwest	3.7	2.6
America West	2.0	2.9
Alaska	1.8	1.2
Others	0.8	0.8

Source: U.S. Department of Transportation

Exhibit II-3 looks back at 1985, and offers a perspective on how market shares in the U.S. airline industry have changed over the years.

Exhibit II-3

Historic Market Share

Carrier	1985 (Percent)
American	13.3
United	12.5
Eastern	10.0
TWA	9.6
Delta	9.0
PanAm	8.1
Northwest	6.7
Continental	4.9
People Express	3.3
Republic	3.2
Others	19.4

U.S. Department of Transportation

In 1994, American Airlines returned to its position as market leader, after United had surpassed American in 1993 for the first time since 1985. Four of the top ten 1985 airlines no longer exist. The top five airlines in 1994 had more than 80% market share, whereas it took 10 airlines to capture the same market share back in 1985.

ii. Rail

The U.S. Department of Commerce estimated that the Amtrak passenger rail industry grew by about 4% in passenger miles in 1994 and will have a 2%-3% growth through the end of the decade. Additional commuter revenue increases are expected from new contracts to operate commuter routes in Miami, San Diego, Dallas and Seattle. Amtrak's goal is to continue to improve rail passenger service while reducing its dependence on federal support.

iii Bus

Though there are hundreds of bus systems in the U.S., both public and private, the largest and most ubiquitous is Greyhound. After its consolidation with Trailways in 1989, Greyhound struggled with a strike of union drivers, bankruptcy, air and rail competitors and the recession. However, it has returned to profitability since 1992 and expects its computerized reservation system (CRS) to provide better customer service and control.

b. Freight Carriers

Excepting the large numbers of small companies in transportation, there are few major freight carriers that remain exclusively within their traditional niches. For instance, UPS is the largest U.S. transportation company and is regulated as a trucking firm, but it has an aircraft capacity that rivals that of Federal Express. CSX is the largest rail-based company in revenue terms, but its subsidiary, Sea Land, carried more containers over water than any other U.S. water carrier. Federal Express is the biggest U.S. air cargo carrier and, to the dismay of the trucking industry, has more than 30,000 ground vehicles that are not ICC regulated.

i. Intermodal

Intermodal transport involves truck and rail, and is the most common of the various multimodal means of freight transport. Much has been happening within the intermodal segment:

- Intermodal had a compound annual growth rate of 6.4% between 1990 and 1994, as compared to 3.5% compound annual growth for rail traffic as a whole.
- A four-year Teamster contract was approved in June 1994, which gives truckers the right to expand their use of rail intermodal service to 28% of their shipments. This should result in modest growth in intermodal traffic during 1995.
- Double-stack railroad capability, which uses special cars that carry containers two-high and doubles train capacity without increasing length, accounted for 40% of domestic intermodal freight in 1994.

ii. Railroads

1994 represented the eighth consecutive year of growth for rails. Rail traffic is expected to grow 3.1% to approximately 1.240 trillion ton-miles in 1995, over 1.203 trillion in 1994. This increase is attributed mainly to the rise in intercity ton-miles, improved coal transport and benefits from cost-cutting measures. Railroads captured a 38.3% share of intercity ton-miles in 1994, and this is expected to reach about 38.5% in 1995.

Railroad's primary commodity, coal, saw a rise in demand. As a result, railroads had coal car loadings totaling 6.64 million units in 1994, an 8.8% increase over 1993. In an effort to relieve congestion created by the high volume of coal transport during 1994, carriers such as Burlington Northern and Chicago & North Western invested approximately $400 million to expand their track capacity. Due to this heavy capital investment by carriers, it is anticipated that 1995 will see an additional firming in rail coal rates.

Over the past few decades, numerous railroads have merged to create new single-line, long-haul corridors and open new markets by cutting freight rates. Today's mergers permit some short-term cost savings, but are mainly undertaken to attract more freight because the merged carrier can offer longer single-line hauls. Burlington Northern has announced its intent to acquire Santa Fe Pacific Corp. This merger would create the nation's largest railroad—about 31,000 miles of track in 27 states and parts of Canada, and revenues of about $7.5 million.

As a cost-cutting measure, the railroad industry has trimmed its workforce by about 40% over the past 10 years. However, with a lean workforce and traffic on the rise, rail employment started picking up in 1994 for the first time in a decade.

iii. Trucking

Trucking is made up of three basic carrier types—truck load (TL) carriers, who move full trucks for shippers; less-than-truckload (LTL) carriers, whose shipments are usually bigger than packages, but that must be shifted from truck to truck to maintain efficiency and utilization; and private carriers, who are owned and operated by shippers.

In recent years the TL segment has seen the entrance of several new, non-union carriers, due to the low barrier to entry into this market. While the larger carriers are reaping the profits, the smaller firms are experiencing a decline in revenue. Schneider National Carriers is a leader in this market, with revenues of $1.17 billion in 1993; J.B. Hunt

Transport is second at $947 million. Private carriers are losing the majority of their long-haul business to the TL segment, as transportation becomes more complicated.

The year 1994 was significant for the trucking industry. Congress deregulated state freight transportation and allowed truckers to stop filing complicated tariffs. The year brought to light a new labor contract that will permit LTL carriers to nearly triple their use of rail piggyback and compete more effectively. Under the terms of the contract, LTL carriers can use rail intermodal for 28% of their shipments.

Until recently, mergers were not very common in the trucking industry. However, there will be an increasing number of mergers occurring over the coming years. Mergers will offer trucking companies the ability to negotiate volume discounts on equipment, supplies and fuel, to obtain lower insurance rates and attract drivers more easily. One of the largest mergers in the truckload industry occurred in 1994, when Swift Transportation Co. acquired Missouri-Nebraska Express (MNX) for approximately $40.3 million. This transaction has made Swift the fourth-largest truckload carrier, with annual revenues of $400 million. In 1994, Heartland Express acquired Munson Transportation Inc. for approximately $18 million. The transaction has allowed Heartland to expand territorially.

iv. Air Cargo

On an industry-wide basis, cargo (freight, express and mail) continued to grow. Competition and the need for greater efficiency have spurred the creation of highly automated sorting hubs supported by a network of aircraft and ground vehicles that are coordinated nationally. Bulk cargo rates could increase from the new General Agreement on Tariffs and Trade.

2. Trends

Even if the economy slows, the transportation business should enjoy robust profits in 1995. There is a new sense of financial and cost discipline in an industry that has, in the past, let itself outgrow demand and as a consequence suffered fierce price competition. Transportation companies have been working with fewer assets, and getting tough with their unions. Traffic volumes have risen sharply, rates are going up and profitability is strong.

INPUT foresees that the transportation industry will continue to concentrate the number of entities through various mechanisms such as mergers, purchases and affiliation. Players in this industry sector constantly encounter the pressure of industry globalization and the need for capital resources to compete (e.g., advanced equipment and technology) and reach the appropriate size. Though all segments will see the creation of global megacarriers, the most obvious changes will be in the fragmented trucking segment, where the barriers to entry are small. The new costs of competition will be too great for most existing firms. Weaker business entities in all segments will find it harder to keep up and will eventually extinguish themselves, but the stronger players will grow faster than the industry.

The U.S. Department of Commerce and industry experts project the transportation industry as a whole to grow, in some segments dramatically. Specific trends for the most active segments are discussed below:

a. Passenger Carriers

i. Airlines

Profits were up during 1994 for major U.S. carriers, with operating profits for the airline industry reaching approximately $2.2 billion. Traffic was up about 3% during 1994. The major contributing factor was fuel prices, which were 13% below those in 1993. The important trends in the airline industry are as follows:

- The trend set by low-fare leader Southwest Airlines, with its direct, low-cost flights, has prompted several major carriers to create an "airline-within-an-airline" with similar features. For instance, Continental Airlines created a low-fare operation called Continental Lite and entered a number of new cities, with short-haul, fast turnaround, low-fare service. This fare war is expected to continue through the decade.

- Over the long run, severe pressure from low-cost rivals such as Southwest may drive labor-intensive transportation carriers to adopt the employee-ownership model of United Airlines.

- Airlines will continue to strive to control costs. Delta, American and USAir have all implemented cost-cutting programs that range from abandoning unprofitable routes to canceling airline orders to trimming payrolls and imposing layoffs. Domestic airline capacity shrank by 2% during 1994.

- The business travel market segment is shrinking as communications technology minimizes the need to fly. This could prove to be harmful to airlines such as American and United that rely on business travel.

- The highly competitive nature of the airline industry will force major carriers to seek niches in order to differentiate themselves from other carriers.

- Carriers are expanding into international markets through partnerships with overseas carriers. United Airlines, for example, has formed several alliances, including a deal in 1993 to merge its European route system with that of Lufthansa.

- The hottest growth areas for airlines in the short term will be found in Asia and Latin America. Pacific Rim growth is 20% to 25% annually and China leads with growth projected in excess of 30%.

- The number of hubs in the U.S. should decrease to 28 or fewer over the next few years as carriers rationalize route structures. However, the hub/spoke style will continue to predominate in the U.S.

- The U.S. aircraft fleet will gradually grow over the next five years; however, noise-level regulations will force the retirement of several plane models by the end of decade. This will most affect newer airlines that use leased older aircraft.

INPUT believes that 1995 will continue to be profitable as long as carriers continue to control costs and restrain capacity growth. The big three U.S. carriers are poised to take advantage of this growth and will successfully expand globally. New start-up, short-haul carriers are coming to cities like Colorado Springs and Pittsburgh, among others, and these airlines will cause price pressure on the major carriers and take over many short-haul routes.

Computerized reservation systems (CRSs) are owned by a few major airlines. Airlines will continue to release control of their CRS businesses either by outright sale or through significant buying, probably by technology companies. The infusion of cash from these profitable

transactions can then be used to help offset the segment's future capital needs for expansion and replacement of aircraft.

ii. Rail

Much of Amtrak's growth is encouraged by increased highway traffic congestion and air pollution. These factors will continue to provide favorable conditions for Amtrak to increase ridership over the next several years. Amtrak's contract to provide U.S. passenger service is due for renewal in 1996.

In recent years, several states with federal funding support have been studying the potential for high-speed rail service outside the Washington, D.C.-to-Boston Northeast Corridor. Shorter travel time and downtown terminals have made the Washington-New York Metroliner the favored travel mode. Higher speed rail will enhance the growth of the railroad segment in the long term and increase the potential of rail picking up travelers from air carriers and automobiles. Of the top 25 airline markets, nine are short to medium distances that could be served by high-speed rail. With trip time reduction, some air trips could be diverted to rail.

iii. Bus

Greyhound's return to profitability bodes well for this premiere bus line. The creation of a CRS for its customers and the resulting management information has enabled Greyhound to compete with its bigger, classier rivals. If Greyhound can turn information into better service and become a low-cost provider, it could grow in share.

b. Freight Carriers

The various modes of surface freight such as truck, rail and water will continue to blend over the coming years. The transportation industry is seeing a transformation from an era of specialization to one of integration and unification across company and industry barriers. Whether it is called intermodal or multimodal, players are working more closely than ever, as technology, information and communications become the basis for global business.

i. Trucking

Trucking is the dominant segment in the U.S. freight market, containing the largest number of carriers, including the largest U.S. transportation company and the world's second largest transportation firm, UPS. By the

end of the decade, however, the number of firms will be drastically reduced as the smaller "mom and pops" are eliminated by the sophisticated, well-managed carriers. Rising coal exports, strong auto traffic and new steel plants will be strong contributors to the profitability of the trucking segment during 1995.

The trucking industry is constantly battling the problem of finding and keeping good drivers, which results in high turnover rates for most companies. In order to eliminate this problem, Landstar System, Inc. of Shelton, Connecticut, employs independent owner-operated trucks rather than salaried drivers. The company provides drivers with cellular phones, computers and other equipment. Landstar's success might cause other trucking companies to follow its example.

ii. Railroads

After years of retrenchment, the railroads were profitable during 1994 as utilization grew. Higher traffic volumes spurred profit growth in 1994 and will continue to do so in 1995. Standard & Poor's estimates that rail-ton miles in 1995 will increase over 1.7%, following a gain of approximately 6.2% in 1994.

Low-cost and non-union short lines like Wisconsin Central and Rail-Tex are expected to do well as they regain market share lost to the trucking segment. Railroads are raising freight rates and turning away less profitable commodities. Intermodal is the rail segment's real growth area, as this mode is cheaper for shippers and highly profitable for rail. The actions of other transport modes combined with the capacity increases by railroads will cause intermodal to exceed current government projections.

iii. Air Cargo

Air cargo will probably be the fastest growing segment, with an estimated annual growth rate of 5.5% through the end of the decade. There will be global competition, particularly in small package delivery, although the trend seems to be toward less time-dependent package offerings.

Asia and Latin America have had substantial increases in air cargo volume. For example, Japan Airlines (JAL), one of the largest airlines in Japan, expects nearly 20 times more volume in the year 2000 than it handled in 1990. The airline is increasing mechanization and robotics use to deal with the increases.

iv. Water

The U.S. water transportation industry consists of deep sea transportation of both U.S. foreign trade and domestic cargoes, as well as shipments of cargo in the Great Lakes, the St. Lawrence Seaway, the inland waterways and local waters. Conditions in the world economy continue to have a direct impact on the international shipping market. Rising trade volumes and a general improvement in freight rates should lead to a stronger performance for U.S. flagliner companies. Liner shipping operators will continue to offer more frequent sailings and faster transit times to meet the just-in-time inventory delivery system used by U.S. manufacturers.

3. Issues

a. Industry

Firms in the different segments within the transportation industry often share some issues but differ markedly on others. Major transportation industry business issues are shown in Exhibit II-4 below.

Exhibit II-4

Major Business Issues

- Using IS to gain competitive advantage
- Cost reduction pressures
- Faster and timely implementation of IS projects
- Downsizing

Prior to the 1980s, transportation firms were faced with the most pervasive government regulation in any industry. The federal government has always established controls in the form of regulation. Because the federal government considers these industries of strategic importance, support in some form continues, and it will not be abandoned regardless of its collective business viability.

Federal government initiatives, in some cases, have had a direct impact on the transportation industry. Significant issues include: fuel taxes, the Clean Air Act, and the North American Free Trade Agreement (NAFTA).

Fuel tax increases will most affect the heavy users—air and truck—which will provide a big advantage to rail and its growing intermodal role in the short term.

The Clean Air Act will impact diesel-powered trucks and automobile travel, particularly for commutation. The rails will benefit by a permanent shift to their use. The telecommuting concept, which is the mode of working at or closer to home, is being encouraged by employers as they seek ways to avoid the impact of the Clean Air Act. If this becomes significant in the years to come, it will have a positive impact on productivity and traffic congestion.

Increase in domestic and intermodal traffic and the emerging potential of increased trade between Canada, Mexico and the U.S. following passage of NAFTA are important factors in transportation firms' decision to merge. NAFTA has already made a visible impact in Canadian transportation. Canadian Pacific (CP Rail) has modified its trademark to include stars and stripes in its maple leaf symbol. State-owned Canadian National Railroad (CN Rail) changed its name to CN North America.

Under the Trucking Industry Regulatory Reform Act (TIRRA), effective August 1994, all independently filed tariffs are null and void. This law annuls the "filed rate doctrine" under which a contract rate mutually agreed upon by shipper and carrier is illegal if not filed with the Interstate Commerce Commission (ICC). As a result, the TIRRA relieves carriers of the expensive and time-consuming process of filing tariffs with the ICC each time they offer a discount rate. In addition, as of March 1994, transportation contracts must be in writing, identify the shipper and carrier, cover a series of movements and provide a means to determine the rate.

In August 1994, legislation was passed deregulating the intrastate movement of freight. Effective January 1995, economic regulation of trucking, such as rates, routes or service in 41 states will stop. These states are the ones that have restricted the free flow of freight in the past.

b. Technology

Transportation firms continue to upgrade information systems capabilities. Executives from major firms have pointed out the contribution of the IS department in the ability of the firm to stay competitive. Some of the major technology issues mentioned by vendors and users in the transportation industry are listed in Exhibit II-5 below.

Exhibit II-5

Major IS Issues

- Focus on customer service systems
- Implementation of systems to achieve seamless services
- Lower operating costs

The various modes of transportation have undertaken a variety of projects to address these issues:

- UPS and Federal Express have developed systems that give customers on-line tracking capability. By giving customers the power to track their own packages, these firms are providing improved service.

- Covia Technologies and its Japanese partners—Mitsubishi Electric and IBM Japan—have jointly developed a Passenger Information System for Kansai International Airport, a new airport in Japan. The system is designed to direct passengers, visitors and operations personnel via display boards and monitors, videotext kiosks, automated flight announcements and automated phone access.

- Several major railroads are working together to develop a single Windows-based system that customers will use to book freight passage on one of the several railroads, including Union Pacific and Canadian National Railroads.

- American Airlines began testing wireless LAN notebook computers for roaming customer service attendants to use to assist travelers with rebookings when counters get full.

- Conrail has in place a PC-based system called ACCESS, which provides customers with real-time shipment status by connecting to the firm's mainframe for data.

- Southwest Airlines offers fax and data on its AirOne phones, manufactured by Claircom Communications.

In the past, transportation firms often have tended to focus on operations and have neglected customer service. In order to correct some of the ills, IS is being asked to build systems that are more shipment-oriented, although operational systems are still significant. Therefore, large, complex systems are being developed in the transportation industry, which has increased transportation firms' interest in the systems

integration and outsourcing vendors who have experience with complex projects. The number of projects handled by these vendors is increasing:

- IBM Integrated Systems Solutions Corporation (ISSC) has been awarded a $500 million contract by Amtrak. Under the terms of the agreement, ISSC is providing Amtrak with business reengineering consulting and equipment moves, adds and changes, network services, data center operations, disaster recovery services, voice and data network services, help desk and PC and LAN support.

- Delta Airlines has a 10-year, $2.8 billion outsourcing agreement with AT&T Global Information Solutions (GIS). The two companies will form a joint venture to handle Delta's information processing operations. In addition, the joint venture will market and sell computing and communications solutions to other firms in the transportation industry.

- The Road Commission for Oakland County, Michigan has awarded Rockwell International's Transportation Systems unit a two-year, $1.9 million contract to provide systems integration for the Faster and Safer Travel-Traffic Routing & Advanced Controls (FAST-TRAC) Program—an Intelligent Vehicle-Highway System (IVHS) initiative in southeast Michigan. Rockwell will provide a transportation information management system that will be the heart of a fully integrated multimodal transportation system.

- CSX Transportation Inc., a railroad company, has outsourced its communications functions to AT&T GIS. AT&T GIS will take over CSX's entire networking operation.

Transportation firms, like all other businesses, are often looking to lower operating costs, provide a high level of customer-oriented services as well as have an efficient, integrated, end-to-end tracking system in place. Therefore, the need for better and more timely communication also increases. The use of intelligent technology in transportation is becoming more feasible as information technology improves.

III

Market Forecast

A
Information Systems Environment

Transportation is a highly competitive industry—both between the mode-based segments as well as within each segment. Firms in the transportation sector generally make use of information systems to meet objectives that are technology driven or technology enabled. Competitive advantage can be gained through better customer service with the use of information systems. These systems can truly become a link for customer satisfaction, which in turn gains competitive advantage.

Transportation firms have started to view the implementation of technology as a requirement rather than a luxury. Players that were early users of information systems have been constantly imitated by competitors. A classic example is Federal Express, whose innovative use of technology for tracking and hand-held driver entry devices created a new expectation for customers. Other freight operators followed suit, but Federal Express still remains the largest player in small package delivery.

Application opportunities in transportation generally vary by segment. But the market for application packages throughout transportation is on the rise. All segments are seeking quality applications that can reduce costs, interface with other segment firms through networks and improve efficiency. Key transportation applications include shipping systems, vehicle applications, applications for network-gathered data and cost-saver packages. Satellite-based networks can be used for tracking and monitoring vehicle and package information.

The most dramatic and potentially powerful uses of information systems technology involve networks that transcend company boundaries. These interorganizational systems can significantly contribute to the enhanced productivity, flexibility and competitiveness of many companies. With the

acceptance of electronic data interchange (EDI), the use of interorganizational systems has grown rapidly in recent years. Boeing's 777 design systems have links with subcontractors in Japan and the U.S. Boeing also has a parts logistics system connected to airlines that provides information regarding parts availability to support aircraft maintenance.

Crossing company boundaries is becoming commonplace, as it is an efficient way to improve business processes, reduce operating costs and deal with customers in a timely and responsive fashion.

INPUT's analysis of the transportation sector indicates that application projects in the transportation sector have been more inclined toward mainframes than desktops and minicomputer platforms. This is explained by the fact that large transportation firms such as the airlines and major railroads have been major computer users since the 1960s. This, combined with established information services organizations, supports the favored status of mainframe solutions. The use of desktop systems tends to be more for prepackaged solutions rather than as the application implementation platform.

After depending on mainframe systems for 30 years, the airline industry is making a move toward adopting more flexible client/server-based systems. By incorporating client/server applications, airlines hope to reduce hardware costs and training, as well as reduce the time needed to process ticketing and reservations. Client/server systems will enable airlines to push on-line transaction processing (OLTP) closer to the point of sale, which will, in turn, eliminate the need to issue tickets by maintaining all flight information electronically.

- Objective Inc., of Boulder (CO) has introduced the Infiniti Travel System, one of the first client/server applications to crack the OLTP environments dominated by mainframes. Continental Airlines Inc. is testing the ticketless Infiniti system, which costs between $1 million to $3 million to install.

- Delta Airlines Inc. is working with Garber Travel Services, Inc. to develop client/server-based systems that will help reduce the time needed to process tickets and reservation requests.

- United Airlines is replacing its mainframe-based inventory system with a $40 million client/server maintenance information system that is more flexible and can track an aircraft's maintenance needs. United believes that this move will save the airline between $1 million and $2 million annually in parts.

In addition, firms in this sector tend to be high users of systems integration and professional services, as they need external expert advice and assistance with application systems. This places the transportation sector firms among the targets for vendors of these services. Although INPUT believes that the variation between companies may be a better predictor of opportunity than total sector analysis, the tendencies shown for a sector can prove to be a valuable tool for vendors.

1. Electronic Data Interchange (EDI)

EDI was conceived by the transportation industry in the 1960s to let shippers transmit manifests, orders and inventory information separate from cargo. INPUT's analysis of the transportation market has shown that this sector is leaning more and more toward EDI. Projects at almost all but the smallest sector companies are in the process of adopting or expanding EDI capabilities. Whether the sector's impetus is derived from its customers' pressure or participants' own desires, companies are beginning to learn the advantages of full EDI integration. Transmission of freight bills has been going on for a while, but now companies are moving away from paper altogether and decreasing the number of transactions. EDI growth in transportation is explosive and a majority of transportation firms will be engaged in most phases of electronic commerce by the year 2000.

Transportation applications have exhibited a high use of mainframe platforms. However, the sector will alter its mainframe preference to favor client/server environments as IS departments become comfortable with that technology. This platform shift will most likely be accompanied by an increased need for external services, specifically professional services and systems integration at the desktop and client/server levels. INPUT research indicates that application development levels for EDI will continue to increase for several years until transportation EDI expenditures reach or exceed parity with those of other sectors.

2. EDI Standards

In 1987, a committee of the United Nations had developed Electronic Data Interchange for Administration, Commerce and Trade (EDIFACT) as an international standard for EDI. But firms in North American and Pacific Rim countries continued to use the ANSI X.12 code structure. The controversy over the EDIFACT or ANSI X.12 formats did not significantly affect the transportation industry, and in early 1995, EDIFACT was finally chosen as the international standard for EDI.

3. Onboard Communications

The desire for companies to communicate directly with their dispersed traveling entities (like truck drivers and railroad engineers) has fueled the growth of several competing systems. Carriers are finally beginning to experience the increased efficiency of interactive communication. Some of the systems available today are based on satellites like Qualcomm's OmniTRACS, others on cellular like the voice/data system from Cadec Systems, and still others are traditional radio-based systems.

4. Two-Dimensional Codes

Automated identification and sortation using bar code technology began in the late 1980s. With the advent of relatively inexpensive lasers that can scan from some distance, many areas of the transportation industry are using bar codes to track trucks, trailers and containers. Roadway and other big players that have implemented automatic sortation have been moving goods quickly and accurately without human intervention. Any application that depends upon accurate entry of information with little or no user intervention is a candidate for bar codes. The two-dimensional bar code technology is slowly gaining importance in the transportation industry and as the standards become solidified, it will be more widely implemented.

5. Customer Automation

Companies such as UPS are currently building customer automation infrastructures that will enable customers to order shipping services, track packages and receive reports by tapping directly into the UPS system from networked PCs. Eventually, the services will be extended to allow a customer to have a package intercepted before delivery, track the specific time that the package arrived at its destination, provide customers with delivery alerts and exception notification and upgrade service while a package is in transit.

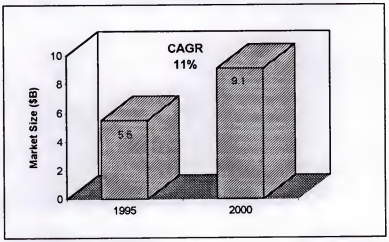
B
Market Overview, 1995-2000

In 1995, the transportation sector's information services expenditure is forecast to grow at a rate of 17% over 1994. The five-year CAGR is forecast at 11% for the period 1995-2000. The growth in transportation and information services expenditures is still lower than in most other industries.

Exhibit III-1 graphs the five-year forecast period.

Exhibit III-1

Transportation Sector—Market Forecast, 1995-2000



Values Have Been Rounded *Source: INPUT*

Markets and their submarkets demonstrate a cyclic pattern over time—revenues are driven up by a new product or service and come back down as the direct market becomes saturated, a different market offers an alternative approach, or sector spending abates. The latter can be driven by the poor economic conditions, the fact that the sector can only sustain so many major technology projects at one time, or seemingly unrelated factors, including government actions.

C
Forecast by Product/Service Market

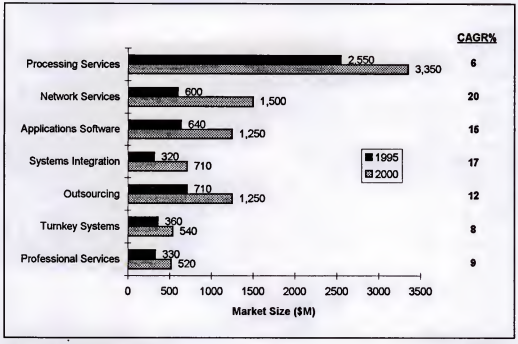
All product/service markets are projected to grow during the five-year forecast period. However, each market is unique and INPUT believes that professional services, processing services and turnkey systems markets will all see diminishing growth. On the other hand, the systems

integration and network systems markets will experience rapid expansion, with projected CAGRs of 17% and 20%, respectively. Even within a market, some submarkets are on a different track than others, including workstation/PC, which outstrips mainframe growth in the applications software market.

Exhibit III-2 presents INPUT's forecast for the transportation sector by product/service market for the five-year period from 1995 through 2000.

Exhibit III-2

Transportation Sector Information Services Market by Product/Service Category, 1995-2000



Values Have Been Rounded *Source: INPUT*

1. Professional Services

The professional services market will grow at a rate of 11% in 1995, increasing from $298 million to $332 million. The CAGR is projected at 9% in the five-year forecast period.

Transportation sector application projects tend to be more mainframe-based than the average of those for most industry sectors. The main reason for this relates to the substantial numbers of large firms within transportation that have been involved with computers for decades. These include airlines and major railroads that have been major computer users since the 1960s. This fact, combined with established

information services organizations, supports the favored status of mainframe solutions and professional services to support them.

The professional services market, which is currently in sixth place, will drop to being the smallest market by 1996. This market is beginning to face stiff competition from the systems integration market, as the larger system projects are usually awarded to complete service providers. As a result, more and more players in the services marketplace are beginning to offer a range of systems integration and outsourcing services in addition to the professional services already being offered. Smaller firms are entering into affiliations that enable them to share in systems integration projects. Strictly professional services suppliers will find business as subcontractors and in specific niche areas of the sector.

2. Systems Integration

Systems integration is experiencing rapid growth and has a projected CAGR of 17% from 1995 to 2000. The market will grow from $270 million to $320 million during 1995. Currently the smallest of the seven product/service markets, systems integration will move up to fifth in size, in terms of total dollar volume, by the year 2000.

The growth of systems integration in the transportation sector will be fueled primarily by the need to provide connectivity between shippers and modes of shipping. Transportation sector firms have traditionally had a focus on operations and have often lost sight of their role in serving customers. Even the trucking companies, which get the highest service grades from shippers, are not immune from having more concern for tires and fuel than a customer's needs. Although transportation operational systems are still significant, IS is being asked to build systems that are more shipment oriented.

3. Outsourcing

In recent years, the role of outsourcing has changed dramatically in the transportation sector. In fact, the last two years have seen the signing of major outsourcing megacontracts, as a result of which outsourcing expenditures are expected to grow at a rate of 100% during 1995, increasing from $354 million to $708 million. The CAGR for the entire market is projected at 12% through the year 2000, reaching a dollar volume of nearly $1.25 billion.

- In August 1994, Delta Airlines announced an agreement with AT&T GIS to form a joint venture company to run all of Delta's information systems except those that support reservations and flight operations. The joint venture agreement is for 50 years; the first 10 years are valued at $2.8 billion.

- In 1994, USTravel awarded EDS an $800 million, 10-year outsourcing contract. EDS is providing USTravel with a wide range of outsourcing services, including applications operations, network management, desktop services and business operations.

- In April 1994, Amtrak signed a $500 million, 10-year outsourcing contract with ISSC.

- In November 1993, Southern Pacific Lines signed a $415 million, 10-year outsourcing contract with IBM ISSC.

These megacontracts have caused the transportation industry to become the fastest growing sector for outsourcing in the U.S. Until these recent contracts there had not been much activity in this sector.

Applications operations includes managing and operating computer systems to perform the customers' business functions, as well as developing and maintaining the customers' applications systems. The growing acceptance of applications operations outsourcing as a logical alternative to internal operations has significantly benefited the applications area, leading to the projection that this submarket should grow at 283% during 1995. The submarket is estimated to reach nearly $700 million by the year 2000.

Business operations is a new submarket that has been added to outsourcing. The demand to outsource companies' business processes is gaining popularity. Processes such as customer service, remittance management and accounting are being identified as primary areas for business operations outsourcing. This market is projected to grow at a rate of 40% during 1995. By looking at the processing services market and identifying the possible services that may evolve into business operations outsourcing, the CAGR for the forecast period is estimated at 33% through the year 2000.

4. Processing Services

Processing services remained flat at 6% in transportation expenditure. This market will probably remain constant unless there are major unforeseen changes in the industry. The processing services market had the slowest growth rate in 1995, growing from $2.4 billion to $2.5 billion. This will probably continue through the rest of the forecast period. The CAGR over the period from 1995 to 2000 is projected at 6%. Nonetheless, opportunity exists in this market because processing services is the largest services market, and even a slight increase here is bigger than the total expenditures for many of the other markets.

The forecasts cover only the revenues for transactions and service agreements, not the expenditures for third-party reservations from the owning airlines (captive revenue). In the processing services market, the base usage is for reservation systems. With airline CRS systems, the predominant entities and growth are ruled by changes in airline boardings. Should airline ownership of CRSs diminish over the next five years, with fees then charged to all airlines, this market would grow dramatically overnight. Expanded reservation charges could yield an extraordinary expenditure total, even with cut rates for high-volume airlines.

Non-airline carriers remain small, with any growth occurring via desktop applications, not processing services. This is another factor that could affect the growth of processing services within the transportation sector.

5. Network Services

Expenditures in the network services market will move up to 19% during 1995 due to the growing use of electronic information systems and wireless systems for fleet management. INPUT believes that transportation firms with established proprietary value-added networks connecting fixed stops or locations will not grow, and may even shrink as a result of carrier downsizing resulting from profitability concerns. The CAGR for network services over the period from 1995 to 2000 is projected at 20%, with total expenditures reaching nearly $1.5 billion by the year 2000.

The effects of the Internet on the overall transportation industry are still speculative. However, some transportation firms are starting to explore this technology. For instance, airline tickets are currently being offered via the Internet. American Travel Corporation, based in Raleigh, North Carolina, has established an Internet-based PCTravel airline reservation

and ticketing service, which allows users to access the Apollo Reservation System, and receive flight, fare and schedule information for over 200 airlines.

The network applications submarket is projected to have a year-to-year growth of 22% and will drive much of the growth in the network services market. The network applications market will slow down as communications capabilities become saturated, and resume growth when more capacity becomes available. The growth in this submarket is also an indicator of opportunity in service markets to fulfill the growing need for systems to make use of the new flow of information from vehicles.

Electronic information services is the larger of the two submarkets and is projected to grow by 17% during 1995. The CAGR through the year 2000 is projected at 18%. The increase can be attributed to the growing use of least-cost routing systems by transportation companies.

6. Applications Software

The overall applications software products market will remain healthy, with a 15% growth during 1995. Expenditures by transportation companies will grow at a rate of 15% between 1995 and 2000, with dollar volumes increasing by almost $650 million. Currently the second largest product/service market, applications software will slip into third place by 1996.

The mainframe submarket will remain unchanged, at 5% growth from 1994 to 1995 as well as for the forecast period, as mainframes continue to fill redefined roles as super-servers. The growth in the minicomputer submarket during 1995 will be approximately the same as the prior year. Though the mainframe and minicomputer submarkets show stability, the trend toward microcomputers is at the expense of other submarkets. Because PC software costs much less than mainframe and minicomputer equivalents, this trend also causes the growth in total dollars to be moderated.

The workstation/PC submarket maintains a strong demand for applications software, with a CAGR projected at 22% for the five-year forecast period. Workstation/PC usage will continue to grow as client/server architectures proliferate and more and more applications are identified to aid in achieving company profitability and performance objectives in this highly competitive industry.

7. Turnkey Systems

Expenditures for turnkey systems are projected to increase at a CAGR of 8% through the forecast period, reaching nearly $540 million by the year 2000. This market continues to be unchanged from the five-year growth pattern forecast in 1994, but with a slight increase in professional services spending at the expense of new software product sales.

Overall, the increase in workstation/PC installations will hold the revenue increases in this market to a modest level. This market will eventually be displaced by the more flexible, less costly PC—used either in a client/server or standalone mode. This trend is causing the turnkey producers to move products to these machines, which serves to hold down prices. Sector buyers will continue to look for software products to run on existing machines or choose to purchase equipment separately to achieve the lowest price. The equipment submarket will have the slowest growth in the turnkey systems market, reflecting the growth in workstation/PC systems with cheaper hardware.

D
Conclusions and Recommendations

The outlook for the transportation sector depends upon the health of the U.S. economy, whether capacity is properly balanced with demand, and whether the industry can achieve stable costs and rates. Transportation firms showed modest growth as the U.S. economy ended 1994 with growth at approximately 4.6%. The outlook for the U.S. economy in 1995 is for controlled, steady growth in the 5.7% range.

1. Conclusions

i. Industry

There will be major shifts in the transportation sector over the next several years. There will be a blending of transportation modes in freight that will result in a transparency of mode to the shipper. This blending will take the form of mergers, acquisitions and affiliations. Although only time will tell which submarket will dominate, the race to provide seamless service by these modes will definitely benefit the customer.

Passenger airlines are keeping their eyes focused on the high-growth international market, and more alliances will take place. The larger airlines are abandoning less profitable routes to cut costs, and this will result in the emergence of a new wave of small startups to fill in these

routes. Some carriers are negotiating better union agreements and encouraging employee-buyouts.

A few major airlines own CRSs. The only major CRS that is owned exclusively by one airline is American's SABRE system. The airlines will continue to release control of their CRS business either through outright sale or through buying, probably by technology companies. Further, American will sell at least part of SABRE before the end of 1996.

Trucking will continue to dominate the freight transport sector. But carriers are constantly faced with upward pressure on fuel prices and labor costs. The growing global production and trade will place further demands on carriers, but at the same time, offer niche markets and international opportunities.

The primary source of rail traffic is bulk commodities such as coal. According to the Department of Commerce, coal is likely to account for approximately 40% of rail tonnage over the next five years. Passenger travel will see a shift to rail as higher speed trains and the congestion of other transport modes drive people to trains.

Overall, transportation firms are continuing to cut costs and are getting by with fewer assets. The sector firms have a new sense of financial and cost discipline that is contributing to the profitability of the industry.

ii. Technology

Information technology, which may increase costs in the short term, will continue to reshape operations and improve service levels. Firms in the transportation sector are employing a wide range of new technologies to improve the flow of information within the company as well as to customers. Technology vendors are providing these firms with solutions to increase productivity, flexibility and competitiveness. Transportation providers that are not taking advantage of information technology at some level will face a rough road ahead.

The major technology and information services trends within the transportation industry are listed below:

- The professional services market will become the smallest of INPUT's seven product/service markets by 1996, due to increasing competition from the systems integration market.

- Systems integration will gain significant business from the transportation industry for large projects. Although transportation operational systems are still significant, more customer service-oriented systems are being built.

- Transportation has become one of the fastest growing sectors for outsourcing, due to some recent megacontracts.

- The processing services market will probably remain constant. Should airline ownership of CRSs diminish, this market would experience dramatic growth.

- The network services market will grow rapidly, due to the growing use of electronic information services and wireless systems.

- The applications software and turnkey systems markets, though having strong growth for PC and client/server approaches, will otherwise be moderate.

2. Recommendations

Historically, the transportation sector—with the exception of airlines—has been viewed as an unattractive technology market. Although transportation is a relatively poor industry sector in terms of profit margins, there is considerable opportunity in this sector. The primary areas for opportunity are in addressing the problems of the various modes of transportation, hot technology issues and future application needs of an industry that is becoming increasingly demanding.

Transportation firms will increase their investment in technology in order to cut costs and operate efficiently. The primary cause of this growth in the freight market will be the need to integrate EDI and real-time location data within processing and decision systems, as well as to respond to customer inquiries. Technology vendors need to help transportation IS organizations devise ways to utilize this explosion of information in ways that will benefit the business.

The transportation sector's bias toward mainframe-based applications will gradually move toward a client/server architecture. The new client/server systems will change, rather than eliminate, the role of mainframe applications. However, IS vendors should be primed to support mainframe solutions as well as integrate legacy systems with their non-mainframe solutions.

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Information Services Market Forecast and Reconciliation

A
Forecast Database

Exhibit A-1 presents INPUT's detailed 1995-2000 forecast for the transportation sector.

Exhibit A-1

Transportation—Market Size Forecast by Product/Service Category, 1995-2000

PRODUCT/SERVICE CATEGORIES	1994 ($M)	Growth 94-95 (%)	1995 ($M)	1996 ($M)	1997 ($M)	1998 ($M)	1999 ($M)	2000 ($M)	CAGR 95-00 (%)
INDUSTRY TOTAL	4710	17%	5509	6061	6698	7364	8155	9094	11%
Professional Services	298	11%	332	367	401	438	475	517	9%
- IS Consulting	80	15%	92	104	119	134	151	170	13%
- Education & Training	40	10%	44	49	53	59	64	70	10%
- Software Development	178	10%	196	214	229	245	260	277	7%
Systems Integration	270	19%	320	380	448	520	605	706	17%
- Equipment	93	18%	110	128	147	166	187	209	14%
- Software Products	18	17%	21	25	30	35	41	48	18%
- Professional Services	152	18%	180	216	257	303	357	425	19%
- Other	7	29%	9	11	14	16	20	24	22%
Outsourcing	354	100%	708	790	880	972	1097	1244	12%
- Platform Operations	150	13%	169	185	200	208	233	261	9%
- Applications Operations	112	283%	429	472	519	571	628	691	10%
- Desktop Services	37	16%	43	50	60	69	84	102	19%
- Network Management	31	19%	37	46	54	64	76	93	20%
- Application Management	14	14%	16	19	23	28	33	39	20%
- Business Operations	10	40%	14	18	24	32	43	58	33%
Processing Services	2395	6%	2550	2705	2875	3015	3175	3350	6%
- Transaction Processing	2395	6%	2550	2705	2875	3015	3175	3350	6%
Network Services	506	19%	600	715	855	1025	1225	1475	20%
- Electronic Information S	358	17%	420	495	585	695	825	980	18%
- Network Applications	148	22%	180	220	270	330	400	495	22%
Applications Software	552	15%	635	708	812	932	1080	1267	15%
- Mainframe	167	5%	175	183	191	200	210	221	5%
- Minicomputer	135	11%	150	160	171	182	195	216	8%
- Workstation/PC	250	24%	310	365	450	550	675	830	22%
Turnkey Systems	335	9%	364	396	427	462	498	535	8%
- Equipment	155	7%	166	180	192	205	220	235	7%
- Software Products	130	10%	143	156	170	187	203	220	9%
- Professional Services	50	10%	55	60	65	70	75	80	8%

Exhibit B presents a reconciliation of INPUT's 1995 forecast for transportation with the 1995 forecast.

Exhibit B

Transportation 1995 MAP Database Reconciliation

PRODUCT/SERVICE CATEGORY	1994 Market				1999 Market				94-99 CAGR per data '94 Rpt	94-99 CAGR per data '95 Rpt
	1994 Market (Forecast)	1995 Report (Actual)	Variance From 1994 Forecast		1994 Market (Forecast)	1995 Report (Forecast)	Variance From 1994 Forecast			
	($M)	($M)	($M)	(%)	($M)	($M)	($M)	(%)	(%)	(%)
Total	4631	4710	79	2%	7531	8155	624	8%	10%	12%
Professional Services	290	298	8	3%	395	475	80	20%	6%	10%
Systems Integration	271	270	-1	0%	665	605	-60	-9%	20%	18%
Outsourcing	281	354	73	26%	565	1097	532	94%	15%	25%
Processing Services	2403	2395	-8	0%	3145	3175	30	1%	6%	6%
Network Services	505	506	1	0%	1205	1225	20	2%	19%	19%
Applications Software	544	552	8	1%	1062	1080	18	2%	14%	14%
Turnkey Systems	337	335	-2	-1%	494	498	4	1%	8%	8%

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INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

GSI
Safa Baghai
25 Bd del l'Amiral Bruix
75782, Paris Cedex 16,
France

TO:RG19-2
Order:120761
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
2		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

UNISYS CORPORATION
John Miniutti
Township LIne & Union Mtg Rd.
Blue Bell, PA 19424

TO:RU09-44
Order:120752
PO:2175

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
1		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

UNISYS CORPORATION
Paul G. Robertson
Township Line & Jolly Roads
MS E2-127
Blue Bell, PA 19424-0001

TO:RU09-47
Order:120675
PO:2175

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
1		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

UNISYS CORPORATION
Steven Haynes
M/S A2-3
Township Line & Union Mtg Rd
Blue Bell, PA 19424-0001

TO:RU09-7
Order:120025
PO:2277053

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
1		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - CALIFORNIA
ATTEN: JUDY Telesales Library
VVN 2 ea Paul only
X,

TO:ZINTERCOB
Order:111024
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
1		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - CALIFORNIA
Bob Goodwin
x
x,

TO:ZINTERCOBB
Order:112521
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
1		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - CALIFORNIA
John McGilvray
x
x,

TO:ZINTERCOC
Order:111631
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
1		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

ADM 495/01
2/95

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
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Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - CALIFORNIA
Library
X
X,

TO:ZINTERCOF
Order:111027
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
2		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - FRANCE
Library - Sales
X
X,

TO:ZINTERCOG
Order:111028
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
1		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - NEW JERSEY
Office Manager
RB/EO/NL 1 Library/ 3 Stock
RP/RB/EO/NL 1-(Sales)

TO:ZINTERCOH
Order:111029
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
2		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - LONDON
Library/Stock
X
X,

TO:ZINTERCOJ
Order:111030
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
2		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - VIRGINIA
Jean/Office Mgr 1 Rpt/RB/EO Library
RB/EO/NL 1ea Sales, Telemkt
RB & EO Stock 2
X,

TO:ZINTERCOK
Order:111031
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
1		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - JAPAN
Tetsuo Imai
Saida Bldg 4-6
Kanda Sakuma-cho, Chiyoda-ku
Tokyo, 101
Japan

TO:ZINTERCOO
Order:111034
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
2		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
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Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. INTERNAL - GERMANY
Frank Solbach
x
x,

TO:ZINTERCOW
Order:111038
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
3		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
Slough, Berkshire SL1 1DZ, England +44 (0)1753 530444

Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z.. REGISTER OF COPYRIGHTS
Dep & Acq Div-LM438C
Library of Congress
Washington, DC 20559
****SHIP BY INPUT CA ONLY****,

TO:ZINTERCOL
Order:111063
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
2		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail

INPUT

San Francisco - 1881 Landings Drive
Mountain View, CA 94043-0848 (415) 961-3300

New York - 400 Frank W. Burr Blvd.
Teaneck, NJ 07666 (201) 801-0050

Washington, D.C. - 1921 Gallows Rd., Ste. 250
Vienna, VA 22182-3900 (703) 847-6870

London - Cornwall House, 55-77 High Street
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Paris - 24, avenue du Recteur Poincaré
75016 Paris, France +33 1 46 47 65 65

Frankfurt - Sudetenstraße 9
D-35428 Langgöns-Niederkleen, Germany +49 6447-7229

Tokyo - Saida Building, 4-6, Kanda Sakuma-cho, Chiyoda-ku,
Tokyo 101, Japan +81 3 3864-0531

PACKING SLIP

Please notify us immediately if error is found in shipment.

TO

Z..INTERNAL - NEW MEXICO
David Jung
150 East Davargas Street #1
Santa Fe, NM 87501

TO:ZINTERCODJ
Order:120754
PO:

QUANTITY	BACK ORDERED	PROJECT CODE	TITLE
1		MVL5-RP	1995 Transporation Sector

DATE	PACKED BY:	NUMBER OF PACKAGES	SHIPPED VIA:

- ❑ UPS ground
- ❑ 2-day Fed X
- ❑ Overnight Fed X
- ❑ Mail
- ❑ DHL
- ❑ DHL World Mail