Market Analysis Program (MAP)

Industry Sector Markets 1989-1994

Transportation Sector

Forecast Update

INPUT®

1280 Villa Street, Mountain View, CA 94041 (415) 961-3300

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INDUSTRY SECTOR MARKETS 1989-1994

TRANSPORTATION SECTOR

FORECAST UPDATE

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Introduction

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Purpose

The purpose of this Forecast Update is to provide the 1989 INPUT forecast for the transportation sector with commentary on recent market and competitive issues. This update should be used in conjunction with the vertical sector report issued in March 1989. Forecasts contained in this Update are reconciled to the data in that report.

B

Environment and Market Changes

The transportation sector is divided into the following segments:

- Airline
- Trucking
- Railroad
- Other (water, mass transit, pipelines, and transportation services)

Increased competition and consolidation in airlines and trucking, influenced by deregulation and economic conditions, continue. Profits were affected accordingly. Railroads are responding to the delivery needs of their largest customers while closely monitoring costs. The sales and profit performance data, shown in Exhibit I-1, support these observations.

EXHIBIT I-1

Change, First Three Quarters 1988-1989

Industry Group	Sales (%)	Profits (%)
Airlines	17	(9)
Railroads	2	42
Trucking & Shipping	21	1

Source: *Business Week*

Following a year of reduced profits resulting from price cutting, transportation companies are focusing on adding value through improved or unique services.

1. Airlines

In response to industry consolidation and increased pressure to control costs, information systems expenditures have focused on:

- Crew scheduling
- Aircraft scheduling
- Revenue models
- Improved seating assignments
- Strategic planning
- Analysis of frequent-flier mileage programs

Revenue models are especially important since they are used to analyze a carrier's response to fare changes by one or more competitors. Efficient seating assignments maximize the number of passengers per flight, thereby increasing revenues with little additional variable cost. Application software for strategic planning enables carriers to better utilize operations built around hub cities.

As international air travel increases, especially to the Far East and South America, air carriers are designing better routing from small U.S. cities to overseas destinations. The new designs feature transparent interfaces to computerized reservation systems.

Airlines' computerized reservation systems (CRSs) provide a crucial service to other airlines, travel agents, hotels, and car rental agencies. Four of the five leading airline reservation systems are owned jointly by

airlines. These reservation systems are being upgraded to provide improved seat reservations, hotel bookings, fare controls, ticketing, check-in, and flight dispatch. Airlines are investing in ancillary software for yield management and booking process management.

Vendors of CRSs are installing personal computers at travel agents' offices, enabling agents to maintain local data bases containing:

- Customer information
- Billing information
- Frequent-flyer program information

Examples of planned user expenditures include:

- American Airlines and Japan Airlines agreed to link their computer reservation systems (SABRE and Axess) by 1990.

- American Airlines will invest $100 million in its Interaact worldwide information system. Hewlett-Packard will supply $18 million worth of minicomputers, NewWave graphical windowing software, and electronic mail software.

Because of the increasing power of CRSs, there is growing pressure to separate CRS business from parent airlines. Industry response so far has been partial separation and co-ownership, such as with United Airlines' Covia system, which is now owned 50.3% by UAL, 11.3% by British Airways, 11.3% by Swissair, 11.3% by USAir, and 15.8% by others.

2. Trucking

Trucking has changed its emphasis from delivery to full service. As a result, trucking companies have invested in the following information systems and services:

- Software for managing terminal operations that support just-in-time inventory management for customers

- Satellite tracking systems, installed in each truck tractor, to transmit and receive information on shipment status, location, estimated time of arrival at the customer's location, freight drop-offs, and freight pick-ups

  - The American Trucking Association (ATA) and the National Motor Freight Carriers Association (NMFCA) requested the Interstate Commerce Commission (ICC) to delay implementation of electronic filing of trucking tariffs. The lack of a standard electronic format for transmitting tariff information will result only in more confusion, according to the ATA and NMFCA. The ATA is now involved in determining a single electronic data interchange (EDI) standard.

3. Railroads

Like trucking, railroads provide a full range of services, some tailored to meet specific customer needs. Railroads are under pressure to reduce costs, since trucking, a key alternative, now operates more efficiently. While maintaining and upgrading track beds, especially in the congested northeast corridor, railroads are investing heavily in information systems. These investments are creating systems for the twenty-first century, specifically:

- Automated train control systems
- Transportation control systems

Automated train control systems, which can be purchased in individual modules, include:

- Train-based reporting on shipments
- Train speed monitoring, which increases track capacity by running trains closer together
- Scheduling systems

Developing a national automated train control system includes expenditures for laying transponders beneath existing track, and for automating base stations and the control center. Rockwell International offers an alternative to the transponder-based ATCS developed by ARINC Research Corp. (Annapolis, MD) under the auspices of U.S. and Canadian railroad trade groups. Rockwell's Advanced Rail Electronics System (ARES) uses U.S. Air Force Navstar Global Positioning Satellites (GPS) to determine the position of a tractor/trailer on a railroad. The ARES system includes sensors that monitor oil temperature, water temperature, crankcase pressure, and other measures of a locomotive's fitness—thus enabling analysts to preempt a breakdown. Both ARINC and ARES can be tied into electronic data interchange (EDI) applications.

A transportation control system includes the following modules:

- Billing
- Pricing
- Maintenance crew scheduling

Another target area for automation is rail yard management. Norfolk-Southern Railroad (Norfolk, VA) has created a system to forecast supply and demand for 21 different types of rail cars and to determine the least-cost route for empty cars to be in position to fill the following week's demand.

Customer service is improving through the use of expert systems. One expert system develops shipping arrangements for organizations seeking to improve inventory flow, and for railroads wanting to better support just-in-time delivery systems.

In 1989, Amtrak (National Rail Passenger Corp.) announced it will buy personal computers for reservation agents at a cost of $20 million, to replace 10,000 to 20,000 outdated terminals. Personal computers will link directly with Amtrak mainframes running software that will enable agents to view train schedules, provide other productivity tools, and print tickets.

4. Other Transportation Modes

More water-based carriers are using third-party services for ocean route planning that is available through networks or application software.

Greyhound Corp. announced plans to spend $100 million over the next five years for personal-computer-based systems for ticketing and producing itineraries. The system will also provide improved statistical information for management. Greyhound is looking into bar coding on tickets and baggage.

C
Events in the Transportation Sector

1. Mergers and Acquisitions

Merger and acquisition activity in the transportation sector was not of sufficient volume in 1988 or the first half of 1989 to be included in the *Mergers & Acquisitions* list of the top ten industry areas.

The following transportation-related mergers and acquisitions valued at more than $200 million took place in late 1988 and 1989:

a. Airlines

- AMR Corp. (Ft. Worth, TX; parent of American Airlines) acquired three regional carriers—Command Airways (Wappingers Falls, NY), Simmons Airlines (Chicago, IL), and Wings West Airlines (San Luis Obispo, CA).

- TWA Acquisition Inc. (Carl C. Icahn, chairman of TWA) acquired the remaining 23 percent of common shares of Trans World Airlines (New York, NY) for $350.8 million.

- Federal Express Corp. (Memphis, TN) acquired Tiger International Inc. (Los Angeles, CA) for $808.6 million.

- Berkshire-Hathaway Corporation (Omaha, NE) acquired a 12% stake in USAir Corporation (Washington, DC) for $358 million, preventing a possible unfriendly takeover.

- Trump Shuttle (owned by Donald J. Trump; New York, NY) acquired the northeast air shuttle service of Eastern Air Lines (Miami, FL), a unit of Texas Air Corp. (Dallas, TX) for $365 million.

b. Trucking

- Kelso & Co. (New York, NY) acquired 86% of the common stock of Arkansas Best Corp. (Fort Smith, AR) for $313 million.

- Consolidated Freightways (Palo Alto, CA) acquired all stock of Emery Air Freight Corp. (Wilton, CT) for $219.7 million

2. Other Activities in Transportation

The U.S. Department of Justice prevented the merger of the largest computerized reservation system (CRS), American Airlines' SABRE system, with the fifth-largest CRS, Delta Airlines Data II. The decision was based on a desire not to strengthen SABRE's position as market leader.

Marvin Davis offered to buy United Airlines in 1989, but was unsuccessful. Ownership of the airline in the long term is still in question.

II

Market Forecast

A

1989-1994 Forecast

1. Total Transportation Sector

Between 1988 and 1989, user expenditures in the transportation sector grew 15%, from nearly $2.4 billion to $2.7 billion. Between 1989 and 1994, user expenditures will grow at a compound annual growth rate of 15% to $5.5 billion.

The 15% growth rate is driven by expenditures for:

- Network-based electronic information services
- Workstation/personal computer application software products
- Systems integration services

2. Processing Services

Expenditures for transaction processing services are primarily for CRSs. Airline purchases of these services aggregated about $1.1 billion in 1988. Processing does not include travel agent fees. Processing services are growing at about 14% per year.

Total processing services expenditures increased 12% in 1988-1989, to $1.7 billion. Over the five-year forecast period, user expenditures will grow 14% annually, to over 3.3 billion in 1994.

There is a significant possibility that CRSs will be separated from airline ownership by federal action. In this case, there will be major opportunities for system operations services, particularly for EDS and IBM. In general, systems operations could become the preferred method of information systems activity in this industry sector, primarily because of the very high telecommunications network intensity.

3. Network/Electronic Information Services

Expenditures for all network/electronic information services grew from $110 million in 1988 to $140 million in 1989, a 28% increase. Expenditures for electronic information services increased 27% in 1989 to $114 million. Over the five-year forecast period, user electronic information expenditures will grow 26% annually to $360 million in 1994.

The largest airlines, trucking companies, and railroads are using more on-line data bases for competitive and demographic information. More information is needed in a highly competitive environment, and better demographic information helps improve marketing and customer service decisions.

Expenditures for network applications grew 33% in 1989 to $27 million. Over the five-year forecast period, user expenditures will grow 32% annually to $107 million in 1994, for the following reasons:

- Trucking companies will use more network services based on satellite transmissions for sending and receiving shipping data between control centers and tractor/trailers on the road.
- U.S.-based airlines will use third-party network services to link computerized reservation systems with those of foreign air carriers.
- Railroads will use more networks to support automated train control systems and transportation control systems.

4. Application Software Products

From 1988 to 1989, user expenditures for application software products in the transportation sector grew 26%, from $260 million to $327 million. Between 1989 and 1994, user expenditures for packaged application software will grow at a compound annual growth rate of 16% to $680 million. Railroads, airlines, trucking companies, and bus companies purchased application software products to improve operations in the following areas:

- Route management
- Profitability analysis
- Integrated customer support/terminal operations systems

The markets for application software products for mainframes and minicomputers will grow more slowly than the market for workstation/PC products. During the next five years, unit shipment growth of mainframes and minicomputers will slow to 3-5% and 8-10% (respectively), and to 10%-15% for workstations/PCs.

User expenditures for workstation/PC-based application software of $100 million in 1989 will grow at a brisk 25% compound annual rate to reach $310 million in 1994. A key driving force is strong spending by transportation firms of all sizes for PC-based software for the following key applications:

- Customer profile information
- Material control

Airlines are also spending for workstation/personal-computer-based application software running in distributed processing environments for monitoring air cargo shipments to international destinations.

5. Turnkey Systems

Users spent $175 million in 1989 for transportation-oriented turnkey systems, an increase of 10% from 1988. Over the next five years, user expenditures will continue to grow 10% annually, reaching $285 million in 1994.

Turnkey systems expenditures will be driven by medium-sized and smaller trucking companies, local and regional bus companies, and specialized needs by nearly all airlines. Airlines will continue to buy turnkey-based systems for:

- Vehicle maintenance
- Aircraft maintenance control
- Parts monitoring
- Timecard reporting

Important turnkey systems applications for trucking companies and bus lines include:

- Fleet management
- Vehicle maintenance control
- Scheduling
- Fuel dispensing

6. Systems Integration

User expenditures in transportation for systems integration grew 21% to $135 million in 1989, and will grow at 19% compounded through 1994, reaching $310 million.

Systems integration activities affect primarily the largest air carriers, trucking companies, bus companies, shipping lines, and pipeline companies. Services to link computers, communications, systems software, and application software will be used more by large national or regional organizations.

7. Professional Services

User expenditures for professional services of $195 million in 1989 will grow at a 13% CAGR to $355 million in 1994, due to steady demands for specialized consulting and software development services. As the level of automation in transportation increases, additional professional services, especially software development, will be contracted to third-party vendors. However, major new systems will be increasingly provided through systems integration contracts and/or systems operations contracts.

III

Competitive Developments

A

Investments in Vendor Firms

Two significant investments in information services vendors serving the transportation sector were:

- For $500 million, United Airlines-owned Covia Corp. (Chicago, IL) sold a 50% share to an airline consortium including USAir Group, British Airways, Alitalia, KLM, and Swissair.

- Comdata Holdings Corp. (Nashville, TN; parent company of Comdata Network Inc.) acquired American Facsimile Systems Inc. (Dallas, TX) for $27.1 million in newly issued common stock. Comdata provides electronic funds transfer and information services to the trucking industry. American Facsimile operates a proprietary network of transmission locations where truck drivers can receive state-issued permits.

B

Vendor Profiles Related to Transportation

The following information services vendors selling to the transportation sector are profiled:

- ATA Services, Inc.
- Concord Computing Corporation
- Railinc Corporation
- Transportation Management Techniques, Inc.

Each profile contains the following information:

- The company
- Key products and services
- Industry markets
- Geographic markets
- Computer hardware and software

ATA SERVICES, INC.
2200 Mill Road
Alexandria, VA 22314
(703) 838-1900

Bill Busker, Executive Vice President and CEO
Private, Wholly Owned Subsidiary of the American Trucking Associations, Inc.
Total Employees: 25
Total Revenue, Fiscal Year End 6/30/88: $2,700,000
Noncaptive Information Services Revenue: $1,500,000

The Company

ATA Services, Inc. (ATAS), was founded in 1976 to provide computer-based services and related consulting to the American Trucking Associations, Inc. (ATA), the trucking industry, and government and commercial clients.

- ATA was formed in 1933 to represent the trucking industry before federal and state governments, and to provide educational materials and training to its members and the industry.

ATAS recently sold its proprietary software package, TRANSPRO, to Bluebird Systems of Carlsbad (CA).

- TRANSPRO is designed to handle the automation needs specific to the freight trucking industry.

ATAS's size and revenue have not changed substantially in the past three years.

- ATAS's 1986 revenue was estimated at $2.5 million, and its 1988 revenue was $2.7 million for an average annual growth rate of approximately 4%.

ATAS currently has 25 employees.

Key Products and Services

ATAS offers a variety of processing and professional services to the transportation and communications industry. Some of the services provided by ATAS include the following:

- Computer timesharing
- EDI network support services
- Data base management
- Data extraction
- Data retrieval
- Data entry
- Systems integration
- Turnkey systems
- Consulting
- Applications development
- Specification development
- Systems management and tuning
- Phototypesetting
- PC product customization
- Mainframe product training
- PC product training

Examples of significant ATAS clients and the services ATAS provides those clients include the following:

- ATA (the parent company of ATAS) uses all of the services ATAS provides in support of the data base applications, publications, and data extraction requirements of ATA.

  - ATA accounts for approximately 45% of ATAS's revenue.

- CruiseNet Cellular Service: The services performed include design, programming, hardware installation, training, documentation, and roll-up accounting of "call-accounting" raw data extracted from cellular systems located on ships at sea.

- American Bus Association: The services performed include maintenance of software developed by ATAS; data manipulation and extracts in support of American Bus Association members; maintenance of the accuracy, completeness, and integrity of data; and data entry.

- Small Business Administration (SBA): ATAS maintains the SBA's data base on ATAS computers, and performs data extractions and disseminations for SBA.

- ATAS has also provided information services to prime contractors in support of Department of Transportation and Department of the Navy contracts.

ATAS offers the Central Site Translate Services of TranSettlements. TranSettlements' TranSend network is an EDI service designed to handle data interchange for freight companies,

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their customers, and their suppliers. The system provides data translation and a central repository for that information to enable processor to processor exchange of data on billing, ordering, and shipment information.

Industry Markets

INPUT estimates that ATAS derived 75% of its fiscal 1988 revenue from the transportation industry and the remaining 25% was derived from the communications industry.

INPUT estimates that approximately 20% of ATAS's fiscal 1988 revenue was government related.

Geographic Markets

ATAS derived 100% of its fiscal 1988 revenue from the U.S.

Computer Hardware and Software

ATAS maintains a data center at ATA headquarters in Alexandria (VA). ATAS uses the following hardware and software:

- 2 DEC VAX mainframes
- 1 DECSystem-10 mainframe
- LAN with 256 communications lines
- WAN using DEC Network Architecture
- More than 170 mini and micro computers
- AT&T System 75 PBX telephone system with over 400 stations

CONCORD COMPUTING CORPORATION
500 West Cummings Park
Suite 3500
Woburn, MA 01810
(617) 933-8910

Victor M. Tyler, Chairman and CEO
Public Corporation, NASDAQ
Total Employees: 267
Total Revenue, Fiscal Year End
9/30/88: $27,218,152

The Company

Concord Computing Corporation provides a range of processing services for the authorization, control, and settlement of transactions of consumers using checks, credit cards, debit cards, and cash cards at supermarkets, truck stops, convenience stores, drug stores, and other retail locations.

- Concord Computing was incorporated in 1970 in Massachusetts. In June 1984, the company made an initial public offering of 400,000 shares of its common stock.

Concord Computing is organized into several business units, most of which operate autonomously:

- Bank Card Services--which include credit card authorization, data capture, and settlement--are provided to retail merchants through EFS, Inc., a wholly owned subsidiary located in Memphis (TN). EFS was acquired by Concord Computing during 1985.

- Check Services--which include check authorization and settlement--are provided to supermarkets and drug store chains by Concord Computing's Retail Service Division located in Chicago.

- Trucking Services--which include cash card and cash forwarding--are provided to trucking firms through Concord Computing's EFS subsidiary.

- EFT Services are provided to financial institutions through Network EFT, Inc. (NEFTI) of Chicago, a majority-owned (57%) subsidiary acquired in 1981.

- Concord Computing also supplies terminal and communications equipment to transaction networks, retailers, and banks.

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Fiscal 1988 revenue reached $27.2 million, a 25% increase over fiscal 1987 revenue of $21.7 million. Net income rose 158%, from $1.1 million in fiscal 1987, to nearly $2.8 million in fiscal 1988. A five-year financial summary follows:

CONCORD COMPUTING CORPORATION
FIVE-YEAR FINANCIAL SUMMARY
($ thousands, except per share data)

	FISCAL YEAR				
ITEM	9/88	9/87	9/86	9/85	9/84
Revenue	$27,218	$21,716	$14,170	$9,411	$7,477
• Percent increase from previous year	25%	53%	51%	26%	38%
Income (loss) before taxes and extraordinary item	$4,607	$1,657	$79	$(1,314)	$1,068
• Percent increase (decrease) from previous year	178%	*	106%	(223%)	87%
Net income (loss)	$2,763 (a)	$1,071 (a)	$30 (a)	$(888)	$609
• Percent increase (decrease) from previous year	158%	*	103%	(246%)	14%
Earnings (loss) per share	$0.80	$0.34	$0.01	$(0.31)	$0.27
• Percent increase (decrease) from previous year	135%	*	103%	(215%)	--

* *Percent change exceeds 1,000%.*

(a) *Includes tax benefits from net operating loss carryforwards of $24,000, $165,000, and $56,000 for fiscal 1988, 1987, and 1986, respectively.*

Growth during fiscal 1988 was attributed primarily to a 33% increase in Bank Card Services sales, a 44% increase in Check Services revenue, and a 21% increase in EFT Services revenue.

Net earnings increased 158% in fiscal 1988 due to improved margins in the Check Services, Bank Card Services, and Terminal Products areas. These three operations turned 66% of their aggregate increase in sales into divisional profit.

- The Check Services improvement was due to larger volume and greater efficiency.
- Bank Card Services benefited from increased volume and lower

selling costs.

- Terminal Products reduced overhead and sold a more customized product at better margins.

Revenue for the three months ending December 31, 1988 reached nearly $7 million, a 3% increase over $6.8 million for the same period in 1987. Net income rose 24%, from $634,713 (9.3% of sales) to $790,129 (11.3% of sales).

As of September 30, 1988, Concord Computing had 267 full- and part-time employees, compared to 223 employees at the end of fiscal 1987. Employees are segmented approximately as follows:

Engineering and technical	40
Manufacturing and operations	187
Sales and administration	40
	267

Key Products and Services

Approximately 87% of Concord Computing's fiscal 1988 revenue was derived from the company's various processing services. The remaining 13% of revenue was derived from sales of terminals and communication equipment.

A three-year summary of source of revenue by business unit follows:

CONCORD COMPUTING CORPORATION
THREE-YEAR SOURCE OF REVENUE SUMMARY
($ millions)

	FISCAL YEAR					
	9/88		9/87		9/86	
ITEM	REVENUE $	PERCENT OF TOTAL	REVENUE $	PERCENT OF TOTAL	REVENUE $	PERCENT OF TOTAL
Bank Card Services	$8.2	30%	$6.1	28%	$2.5	18%
Check Services	6.8	25%	4.8	22%	4.3	30%
Trucking Services	4.6	17%	4.1	19%	3.8	27%
EFT Services	4.1	15%	3.5	16%	2.7	19%
Terminal Products	3.5	13%	3.2	15%	0.9	6%
TOTAL	**$27.2**	**100%**	**$21.7**	**100%**	**$14.2**	**100%**

EFS, Inc., a wholly owned subsidiary of Concord Computing, provides bank credit card authorization, sales data capture, and settlement processing services for VISA, MasterCard, Discover, and American Express transactions at retail points-of-sale.

- The company places electronic terminals at retail merchant locations to process credit sales transactions, including daily payment to the merchant.
- When a consumer makes a purchase at a retailer, the consumer's card-issuing bank reimburses EFS the next day for all transactions authorized, less an interchange fee. EFS then reimburses the merchants, less a discount fee. EFS also receives revenue from the rental of terminal equipment.
- Bank Card Services are used by over 6,000 retailers nationwide.
- During 1988, a long-term agreement was reached for the processing of Sears' Discover Card transactions.

The Retail Services Division authorizes the cashing of checks by consumers in supermarkets and drug chains, primarily in the Midwest and West.

- During 1988, the company renewed long-term contracts with two dominant supermarket chains in Chicago, including Concord Computing's largest single customer. The company also completed the installation of service for the two largest supermarket chains in St. Louis and began installing service in

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the Kansas City market.

Trucking Services allow truck drivers to transact the purchase of fuel and services and receive cash advances of up to $100 at any of over 3,500 authorized truck stops nationwide.

- Trucking companies are issued plastic cards and checks by Concord Computing's EFS subsidiary. Each time a truck driver gets cash, fuel, or services, EFS gives an approval and records the transaction. Truck stops are reimbursed daily by EFS.

- Concord Computing, through EFS, receives fees from the truck stops and trucking companies for these transactions.

- The trucking companies also access EFS's computers for data about their drivers.

EFT Services are supplied by Concord Computing's Network EFT, Inc. subsidiary. These services are used by financial institutions--such as banks, savings and loan associations, and credit unions--to make deposit and withdrawal services available to customers at supermarkets and convenience stores.

- Services typically include cash withdrawals from checking and savings accounts, deposit-taking, balance inquiries, and cash advances.

- During fiscal 1988, Concord Computing processed 12 million transactions for customers of 390 financial institutions through terminals located in 590 supermarkets and convenience stores. During fiscal 1987, Concord Computing supplied these services to 250 financial institutions.

Concord Computing designs, develops, and contracts with manufacturers to build the LINX family of terminal products and communication equipment for use in transaction processing networks. The company sells these products to financial institutions, supermarket chains, retailers, data processing companies, regional electronic funds transfer networks, and third-party processors.

- Approximately 20% of shipments are to customers of the company's Check Services.

- In October 1988, Concord Computing entered into a contract with Manufacturing Solutions, Inc. (MSI) whereby MSI will manufacture certain transaction terminals designed by Concord Computing.

- During fiscal 1988, Concord Computing entered into a seven-year Technical License Agreement with GoldStar Co., Ltd. of Seoul (South Korea). The agreement granted GoldStar an exclusive license to manufacture and sell specified cash dispensing system products in Korea. Concord Computing also granted GoldStar a nonexclusive license to sell the specified products worldwide, except in the U.S.

Industry Markets

Approximately 55% of Concord Computing's fiscal 1988 revenue was derived from the retail industry, 17% from the trucking industry, and 15% from the banking and finance industry. The remaining 13% of revenue was derived terminal product sales to a range of industries.

Geographic Markets

One hundred percent of Concord Computing's revenue is derived from the U.S.

In addition to its headquarters in Woburn (MA), the company has sales offices in Elk Grove Village (IL), St. Louis (MO), Aurora (CO), and Memphis (TN).

Computer Hardware

Concord Computing maintains the following data centers for its various processing services:

- The Elk Grove (IL) data center has a Tandem system in support of the company's Check Services and EFT Services.
- The Memphis (TN) data center has Stratus systems installed for Trucking and Bank Card Services.

RAILINC CORPORATION
50 F Street, N.W.
Washington, D.C. 20001
(202) 639-5580

Henry W. Meetze, President
Subsidiary of Association of American Railroads
Total Employees: 125
Total Revenue, Fiscal Year End 12/31/88: $14,000,000

The Company

RAILINC[R], founded in 1982, provides network services, including electronic data interchange (EDI) and industry data bases, and software products to the transportation industry. Clients include rail, ocean, and motor carriers, manufacturers, and distributors.

RAILINC is the data processing subsidiary of the Association of American Railroads (AAR). RAILINC's 1988 revenue of $14 million includes approximately $8 million from AAR and its members.

Key Products and Services

Approximately 80% of RAILINC's 1988 revenue was derived from network services and 20% from software products.

RAILINC's network services include the following:

- The CLM Collection Service electronically collects Car Location Messages (CLMs) from most major rail carriers in North America, providing shippers with a single source of CLM information.
  - The service is targeted to rail shippers with owned or leased fleets of any size, consignees, shippers' agents, and trucking companies.
  - There are currently 70 users.
- The Data Exchange System consolidates car hire or car repair bills from over 95 railroads and provides them to railcar owners in computer processable form.
  - Over 90% of all car hire allowances and car repair bills are reported to RAILINC's Data Exchange System.
  - There are currently over 200 users of the system.

- RAILINC's telecommunications network is currently used for EDI transmissions by over 300 clients, including rail carriers, manufacturers, ocean carriers, and trucking companies.

  - As a RAILINC subscriber, a customer can communicate electronically with any other subscriber, including rail, ocean, and motor carriers, manufacturers. and distributors.

  - Documents frequently exchanged by subscribers include purchase orders, invoices, shipment tracing messages, bills of lading, freight bills, and administrative messages.

- Data bases maintained by RAILINC include the following:

  - TRAIN II[R] (Telerail Automated Information Network) is an international freight car data base. TRAIN II collects information on freight car, trailer, and container movements across the U.S., Canada, and Mexico. Processing over 850,000 records per day, TRAIN II serves as the official source of interchange information for car hire calculation. There are currently over 100 subscribers to this service.

  - UMLER[R] is a computerized version of the Official Railroad Equipment Register. This data base contains information on the physical characteristics of more than 3 million registered freight cars, trailers, and containers.

- The Reload Fleet Management service is a computerized railcar tracing and pool management service that automatically collects CLMs and TRAIN II data and locates the appropriate railcar for the next load using the shortest possible distance. There are currently seven clients using this service.

RAILINC offers several microcomputer software products for use with its network services. The products are available for IBM PC/XT, AT, PS/2 and compatible microcomputers and include the following:

- CLM/PC Tracing Software assists shippers in tracing rail shipments. CLM/PC collects CLMs through RAILINC's network and sorts and stores the information based on the requirements of the user. There are currently 20 installations of the software.

- CRB/PC, introduced in 1988, provides mechanized car repair billing procedures and electronic access to the RAILINC's Data Exchange. There are currently five installations of the software.

Network subscribers include all major rail carriers, as well as manufacturers, distributors, and ocean and motor carriers.

Geographic Markets

Virtually all of RAILINC's revenue is derived from North America.

Computer Hardware and Software

RAILINC maintains IBM computers at its data center in support of its various network services.

Clients may access RAILINC's network via dial-in and dedicated leased lines.

TRANSPORTATION MANAGEMENT TECHNIQUES, INC.
1391 Old Mill Circle
Winston-Salem, NC 27103
(919) 760-7100

Jay C. Paterson, CEO
Private Company
Total Employees: 17 (4/89)
Total Revenue, Fiscal Year End 12/31/88: $2,500,000

The Company

Transportation Management Techniques, Inc. (TMT), founded in 1980, provides maintenance management software products and turnkey systems for transportation, distribution, construction, and utilities companies requiring vehicle maintenance.

TMT operates as an IBM Business Partner, Industry Application Specialist.

TMT's 1988 revenue reached $2.5 million, a 25% increase over 1987 revenue of approximately $2 million.

Key Products and Services

Approximately 70% of TMT's revenue is derived from application software products and 30% from turnkey systems.

TRANSMAN is a vehicle maintenance management system that controls maintenance expenses for vehicles.

- TRANSMAN is available as a software product or turnkey system for IBM System 38 and AS-400 computers, and IBM and compatible microcomputers. It supports the Corvus, Novell, IBM PC Network, and IBM Token Ring network configurations.

- TRANSMAN modules, which are available separately or as an integrated system, include:

  - Preventative Maintenance Scheduling
  - Parts Inventory Management
  - Fuel Cost Management
  - Tire Expense Management
  - Warranty Management

- TRANSMAN software pricing is based on the number of vehicles, number of client locations, and hardware supported.

- IBM and compatible microcomputers: TRANSMAN modules range in price from $500 to $14,000 and total system (all modules) prices range from $5,500 to $50,000.
- IBM System 38 and AS/400: TRANSMAN software system prices range from $25,000 to $50,000.
- TRANSMAN source code is also available.

• There are currently over 300 TRANSMAN clients.

TMT also provides enhancements, custom programming, training, on-site installations, and telephone consultations at a negotiated price. Annual maintenance contracts are available for 15% of the software purchase price.

Industry Markets

TMT has clients in the trucking/transportation, distribution, construction, utilities, and city government markets, as well as clients in other industries that have fleets that require maintenance.

Clients include Pepsi-Cola, American Bakeries, U.S. Trucking, United Truck Lines, Brink's Inc., Safeway Stores, the City of Grand Junction, the City of Pueblo, Cleveland Public Schools, Diversified Products, Thrifty Car Rental, The Toronto Star, Central Canada Grocers, K-Mart Stores, and Von's Groceries.

Geographic Markets

Approximately 85% of TMT's revenue is derived from the U.S. The remaining 15% is derived primarily from Canada.

Computer Hardware

TMT has one IBM AS/400 and approximately 12 IBM microcomputers installed at its headquarters. These machines are used for research and development and customer support.

TR-A

Appendix: Data Base

A

Data Base

The INPUT data base presents user expenditures for information services in the transportation sector by delivery mode and submode.

User expenditures are shown for the U.S. in current dollars (i.e., expenditures include inflation).

EXHIBIT A-1

Transportation Sector
User Expenditure Forecast
by Delivery Mode, 1989-1994
($ Millions)

Sector by Delivery Mode	1988	Growth 88-89 (%)	1989	1990	1991	1992	1993	1994	CAGR 89-94 (%)
Total Transportation Sector	2,370	15	2,720	3,120	3,580	4,120	4,740	5,460	15
Processing Services	1,560	12	1,750	1,994	2,272	2,588	2,950	3,361	14
- Transaction Processing Services	1,520	12	1,702	1,941	2,212	2,522	2,875	3,278	14
- Systems Operations	40	18	47	53	59	66	74	83	12
Network/Electronic Information Services	110	28	141	179	228	290	369	470	27
- Electronic Information Services	90	27	114	144	181	229	288	363	26
- Network Applications	20	33	27	35	46	61	81	107	32
Application Software Products	260	26	327	376	433	501	581	678	16
- Mainframe	110	17	129	140	153	167	182	198	9
- Minicomputer	80	22	98	109	122	137	154	172	12
- Workstation/PC	70	44	101	126	158	197	246	308	25
Turnkey Systems	160	10	175	195	210	235	255	285	10
Systems Integration	110	21	133	158	190	225	270	310	19
Professional Services	170	14	194	219	247	280	316	357	13

B

Data Base Reconciliation, 1988-1993

1. Variance for 1988 Market Revenues

For each of the delivery modes or submodes, the 1988 market forecast in 1988 is consistent with the reported market from the 1989 report.

2. Changes to Forecast Five-Year Growth Rates

The transportation industry is very sensitive to general economic conditions. INPUT's more conservative forecast for economic growth this year is reflected in a general reduction in growth rates throughout this segment.

a. Processing Services

INPUT slightly decreased the compound annual growth rate (CAGR) for processing systems operations in transportation, from 16% to 12%. This forecast assumes that major airline CRSs will not be turned over to services companies as a result of government action or otherwise. The forecast also assumes that the systems operations of major transportation companies of all types will stay in-house.

However, INPUT believes there is a distinct possibility for a breakthrough in this market as has happened in process manufacturing this year. In that event, there will be a discontinuity in market growth.

b. Network/Electronic Information Services

INPUT lowered the CAGR for the network applications component of the network/electronic information services category from 34% to 27% as a result of the adoption of electronic data interchange (EDI) by more sophisticated users during the past three years. In fact, the growth rate in EDI expenditures indicates relatively strong acceptance of EDI by railroads and trucking companies, in response to customer demands. However, the acceptance of EDI by the largest firms augurs a slower growth rate as medium and smaller firms do not have the infrastructure in place to support network-based EDI.

c. Application Software Products

The CAGR estimate for mainframe-based application software products decreased from 16% to 9%, as the number of mainframe computer shipments is expected to increase only 3-5% per year over the forecast period.

EXHIBIT A-2

Transportation Sector Data Base Reconciliation of Market Forecast

Industry Sector	1988 Market			1993 Market			88-93 CAGR per data 88 Rpt. (%)	88-93 CAGR per data 89 Rpt. (%)
	1988 Report (Forecast) ($M)	1989 Report (Actual) ($M)	Variance as % of 1988 Report	1988 Report (Forecast) ($M)	1989 Report (Forecast) ($M)	Variance as % of 1988 Report		
Total Transportation Sector	2,370	2,370	-	5,145	4,740	(8)	17	15
Processing Services	1,560	1,560	-	3,020	2,950	(2)	14	14
- Transaction Processing Services	1,520	1,520	-	2,940	2,875	(2)	14	14
- Systems Operations	40	40	-	80	75	(6)	16	12
Network/Electronic Information Services	110	110	-	475	370	(22)	34	27
- Electronic Information Services	90	90	-	285	290	(2)	26	26
- Network Applications	20	20	-	190	80	(42)	57	32
Application Software Products	260	260	-	715	580	(19)	22	16
- Mainframe	110	110	-	230	180	(22)	16	9
- Minicomputer	80	80	-	200	155	(23)	18	12
- Workstation/PC	70	70	-	285	245	(14)	32	25
Turnkey Systems	160	160	-	260	255	(2)	10	10
Systems Integration	110	110	-	335	270	(19)	26	19
Professional Services	170	170	-	340	315	(7)	16	13

The CAGR for minicomputer-based application software was decreased from 18% to 12%, due to the growing influence of microcomputer-based solutions in transportation. Medium and smaller trucking companies, bus lines, airlines, and airfreight carriers are automating with standalone or networked personal computers.

The CAGR for workstation- and personal-computer-based application software products was decreased from 32% to 25%, still a relatively high growth rate.

- Personal computers will be the primary means for small transportation companies that have not yet automated to do so quickly and cost-effectively. Smaller, niche-oriented companies must automate in order to remain viable.

- Large and medium transportation companies will continue to invest in PCs to help automate location management, vehicle or aircraft maintenance, vehicle/train safety, load management, and customer service.

d. Systems Integration (SI)

INPUT lowered the CAGR from 26% to 19% because:

- A larger base is now established.

- There will be fewer project opportunities in SI compared to other industry sectors due to the limited number of large companies in the sector.

e. Professional Services

The CAGR for professional services was dropped from 16% to 13% to reflect the more conservative view of the economic environment and consequent reduction in new systems activities by transportation companies.

- EDI/SYNAPSE[R] provides for the entry, transmission, receipt, and processing of data using ANSI, X12, TDCC, WINS, UCS, and most other EDI standards. There are currently 50 users of EDI/SYNAPSE.

- TRUMPS[R] offers electronic access to both RAILINC's TRAIN II and UMLER data bases. Optional EDI capabilities permit the exchange of bills of lading, waybills, and administrative messages. There are currently 100 TRUMPS users.

- RAILINC also offers both asynchronous and bisychronous PC communications packages which permit companies to communicate with RAILINC's network.

RAILINC's Short Line Management System is a software product designed specifically for small rail carriers.

- The software automates general accounting and transportation accounting functions through the following modules, which may be purchased separately or as a complete system:

  General Business:

  - Accounts Payable
  - Accounts Receivable
  - Fixed Assets Accounting
  - General Ledger
  - Inventory Control
  - Payroll

  Transportation:

  - Car Hire Payables
  - Car Hire Receivables
  - Freight Bill Processing
  - Interline Freight Settlements
  - Waybill Tracking
  - Outbound Waybill Processing

- The software runs on IBM PC/XT, AT, PS/2, and compatible microcomputers or the IBM System 36.

- There are currently 15 users.

Industry Markets

RAILINC is a for-profit subsidiary and pursues business opportunities in non-rail industries. Marketing efforts are directed primarily at rail customers and suppliers.