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FREIGHT TERMINALS OPERATING ENVIRONMENT

R.E. Morris
K.S. Merrill

THE DECISION GROUP, INC.
1340 Old Chain Bridge Road
McLean VA 22101

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FINAL REPORT

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16. Abstract

The research analysis has been directed toward (1) developing a realistic, quantitative description of the structure of the economic zones that are centered upon medium-size urban areas, (2) determining the nature of traffic in manufactured goods which are most susceptible to intermodal transportation, and (3) identifying trends in the surface freight transportation environment to 1990 and beyond.

The range and dispersion of the statistical data which describe each of the 13 urban areas that have been examined (three are adjacent city-pairs with a coalesced economic vitality) disclose the lack of a pattern of surface freight transportation services among medium-size communities. All of the traffic in fabricated commodities can be efficiently moved in intermodal service.

Both the motor carriers and the railroads evidence either an open mind or a firm commitment to mutually beneficial intermodal ventures. Intermodal freight service will become the shippers' preferred option when (1) intermodal trains are given precedence and scheduled service becomes dependable, (2) rail and motor carriers establish transregional intermodal corridors as cooperative mutually profitable ventures, (3) organized labor evaluates the potential benefits of intermodal operations to its members, and (4) the hub concept of strategically located profitable intermodal facilities has been implemented throughout the rail industry.

17. Key Words	18. Distribution Statement
Motor Carriers, Intermodal, Railroads, Manufactured Products, Commercial Zone, Terminal Area, Surface Freight Transportaion	Document is available to the public through the National Technical Information Service, Springfield, Virginia 22161

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PREFACE

This report presents a generalized characterization, or description, of the structure of a typical economic zone which is centered upon a medium-size urban area. The distinctive nature of the surface freight transportation activity associated with each of thirteen representative economic zones is presented in uniform summary detail.

This research analysis was performed by THE DECISION GROUP, Inc. of McLean, VA under contract DTRS57-80-C-0031 for the

U.S. Department of Transportation,
Research and Special Programs Administration,
Transportation Systems Center,
Cambridge, MA

As Project Manager, Dr. William C. Spaeth, Jr. of the Advanced Systems Branch, National Transportation Research Division, Office of Systems Research & Analysis provided consistent guidance throughout the complex data correlation and quantification aspects of this research analysis.

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1. INTRODUCTION

This study involved an operational and quantitative examination of the surface movement and handling of manufactured products between and within economic zones which are localized about medium size metropolitan areas.

For the purposes of this study, an economic zone is defined as:

> A metropolitan area with a medium-size city as its focus, together with the contiguous suburbs and industrial satellites; for example, shopping malls, industrial parks and factories.

Each economic zone is a circle, the diameter of which is the longest line connecting any two commercial sites on opposite sides of the focal city.

The research objectives were (1) to develop an initial characterization of the surface transportation freight terminals operating environment in the vicinity of medium-size urban areas, (2) to identify trends in that environment toward 1990, and (3) to develop a set of generalized parameters to describe a "typical" medium-size terminal area.

the city at an industrial satellite which draws its workforce from the nearby sample-city, disclosed the nature of inbound and outbound freight traffic. Freight volume and activity were determined from discussions and in correspondence with the regulated motor carriers and with the railroads serving each sample city. All Class I railroads and those regulated motor carriers which had terminals in 6 or more sample-cities were approached.

See: Listing of the 13 Economic Zones Selected As a Representative Sample; Figure 1, Map of the United States with the 16 Sample-Cities Indicated; Figure 2, Matrix of Regulated Motor Carriers Serving Any Sample-City Together with Terminal Sites; Figure 3, Matrix of Railroads with a TOFC Site At any Sample-City; and the Listings of (1) Motor Carriers with Terminal Facilities in 6 or More Sample-Cities, and (2) Class I Railroads Serving Any of The Sample-Cities.

FIGURE 1: MAP LOCATING THE 16 SAMPLE-CITIES

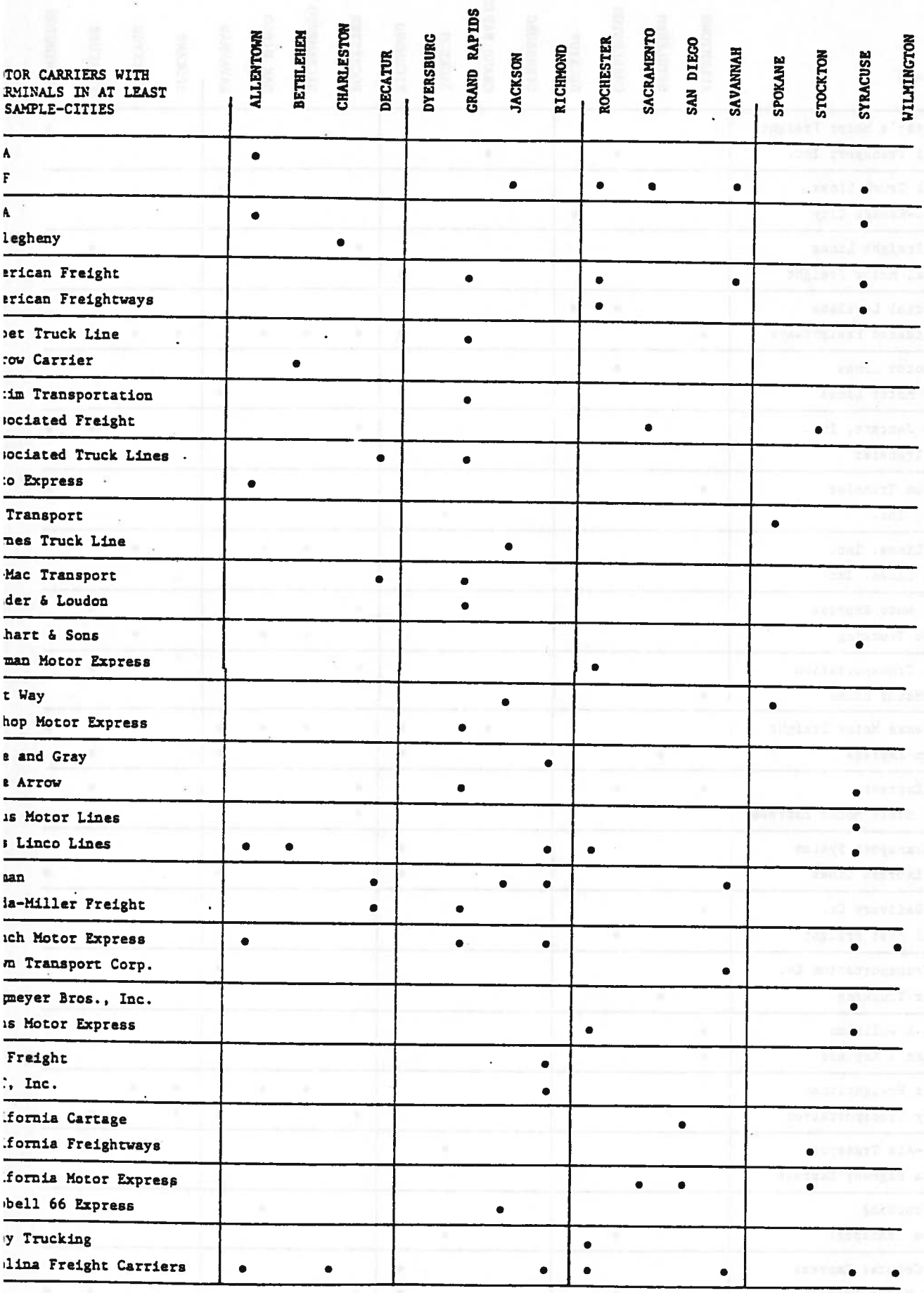


FIGURE 2. MATRIX OF REGULATED MOTOR CARRIERS SERVING ANY SAMPLE-CITY TOGETHER WITH TERMINAL SITES

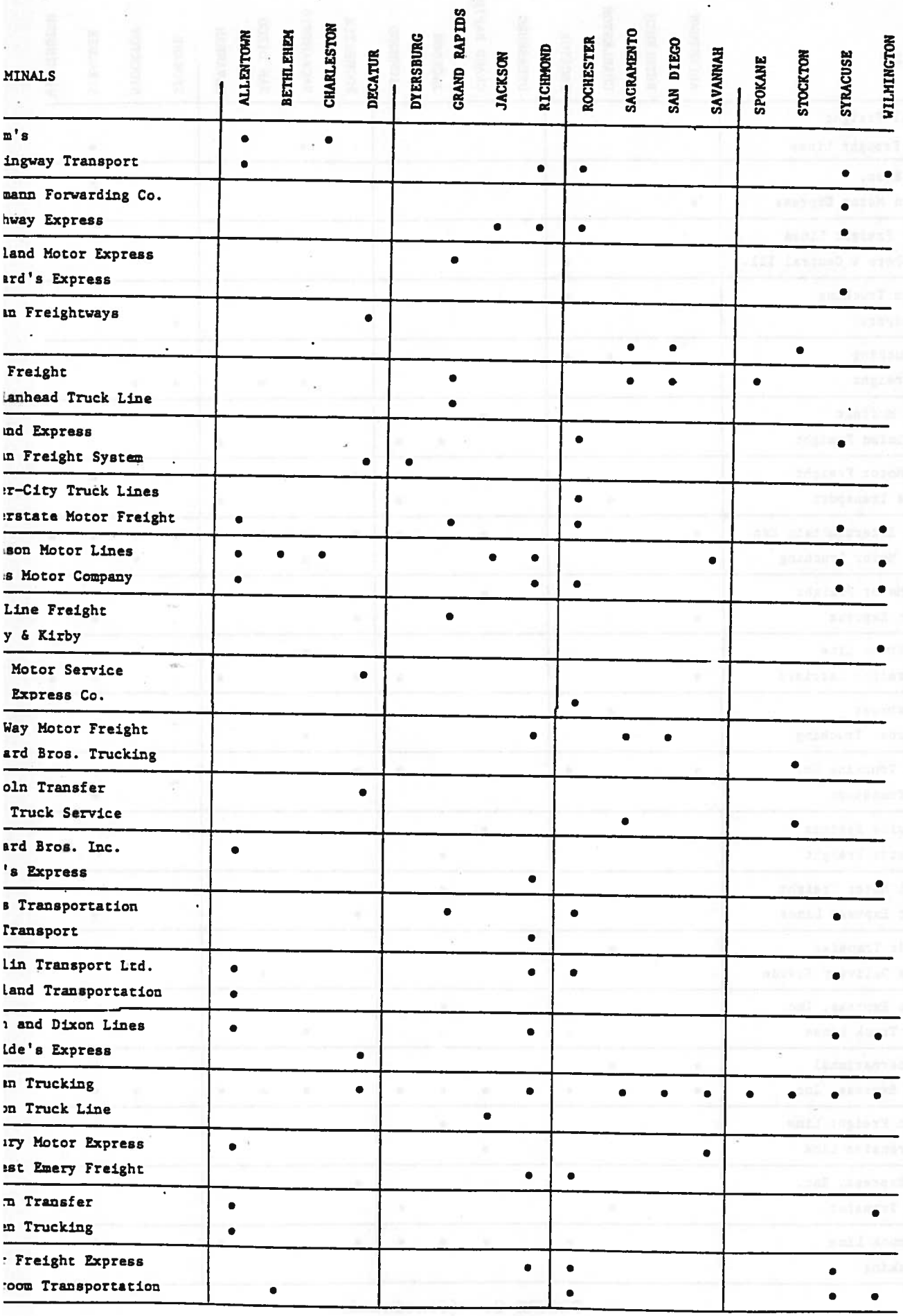


FIGURE 2. (Continued)

TERMINALS	ALLENTOWN	BETHLEHEM	CHARLESTON	DECATUR	DYERSBURG	GRAND RAPIDS	JACKSON	RICHMOND	ROCHESTER	SACRAMENTO	SAN DIEGO	SAVANNAH	SPOKANE	STOCKTON	SYRACUSE	WILMINGTON
Sacramento Auto Truck										•						
St. Johnsbury Trucking	•	•							•						•	
Salt Creek													•			
Santa Fe Trail										•				•		
Sartain Trucking					•											
Schuster Express	•								•						•	
Seaway Motor Express									•						•	
Seawheels, Inc.								•				•				
Service Transportation				•												
Sharron							•									
Shay's Service									•							
Shipper's Imperial														•		
Short Freight Lines						•										
Silver Eagle													•			
Silver Wheels Freightlines													•			
Smiser Freight										•	•					
Smith & Solomon								•								
Smith's Transfer Corp.	•		•	•				•				•				
Snyder Motor Freight								•								
Southeastern Freight												•				
Spector Freight System	•			•		•	•	•	•			•			•	
Starkweather Freight									•							
Stott & Davis Motor Exp.									•						•	
Sturm Freightways				•												
Suburban Motor Freight			•													
System 99										•	•		•	•		
Taynton Freight System									•						•	
Thompson							•									
Thurston Motor Lines								•				•				
Tidewater Inland Express															•	•
TIME-DC									•	•	•		•	•	•	
Transamerican Freight	•					•									•	
Transcon Lines	•					•		•	•	•	•		•		•	•
Transport Motor Express				•												
Tucker Freight Lines						•										
U.S. Truck Company						•										
United Trucking Service									•						•	
Van Curler Trucking									•						•	
Virginia-Carolina Freight			•					•								
Wallace-Colville Motor													•			
Watkins Motor Lines										•	•	•				
Wells Cargo										•						
Williams Transportation											•					
Willig Freight Lines										•						
Wilson Freight Company	•		•	•				•	•						•	
Wilson Trucking Corp.								•								
Wooleyhan Transport																•
Yellow Freight System	•		•			•	•	•	•	•	•	•	•	•	•	•

FIGURE 2. (Continued)

RAILROADS \ CITIES	ALLENTOWN	BETHLEHEM	CHARLESTON	DECATUR	DYERSBURG	GRAND RAPIDS	JACKSON	RICHMOND	ROCHESTER	SACRAMENTO	SAN DIEGO	SAVANNAH	SPOKANE	STOCKTON	SYRACUSE	WILMINGTON
Atchison, Topeka & Santa Fe											•			•		
Burlington Northern													•			
Canadian National						•										
Grand Trunk Western						•										
Central California Traction										•				•		
Chessie System																
Baltimore & Ohio				•					•							•
Chesapeake & Ohio			•			•		•								
Conrail	•	•	•			•			•						•	•
Delaware & Hudson	•	•														
Illinois Central Gulf				•	•		•									
Illinois Terminal				•												
Norfolk & Western				•												
Octoraro																•
Philadelphia, Bethlehem and New England		•														
Richmond, Frederickburg and Potomac								•								
San Diego & Arizona Eastern											•					
Seaboard Coast Line								•				•				
Southern Pacific										•				•		
Southern																
Central of Georgia								•				•				
Stockton Terminal & Eastern														•		
Union Pacific													•			
Spokane International													•			
Wabash Valley				•												
Western Pacific										•				•		
Sacramento Northern										•						
Tidewater Southern														•		

FIGURE 3. MATRIX OF RAILROADS TOGETHER WITH TOFC SITES AT ANY SAMPLE-CITY

and each Class I railroad was telephoned and requested to provide specific operating data from which a generalization for a "typical" medium-size metropolitan area could be developed.

A discussion guide was prepared to provide for uniform development of data and information from each carrier to the desired level of detail, completeness and currentness for each sample-city. Because of language differences between the trucking and rail modes, two slightly different versions of the discussion guide were tailored. Each carrier official who offered to meet with a DGI professional staffmember was mailed the appropriate discussion guide together with a commercial profile for each sample-city served. (See Sample Letter and Figures 4 and 5).

During interviews with carrier officials and their terminal operations staffs, each discussion guide issue was examined, clarified and expanded upon to establish a comprehensive understanding on the part of each carrier of the nature, intent and scope of this study. Each carrier was only requested to provide data which it normally recorded. While the nature of current operations and the evolving new efficiencies forecast for the 1980's were best articulated during an interview, the task of aggregating and formatting site-specific operating statistics was assigned by the carrier official to the appropriate terminal operations personnel for post-interview completion.

From the carrier-provided statistics for the 16 sample-cities (13 economic zones), a generalized characterization of surface freight transportation activity within the economic zones about medium-size urban areas was developed.

FREIGHT TERMINALS OPERATING ENVIRONMENT STUDY

Contract DTRS-57-80-c-0031

DISCUSSION OUTLINE FOR CONFERENCES

WITH

TRANSPORTATION INDUSTRY EXECUTIVES

DGI-R-620-80

A. Terminal-Specific Information

I Economic Zone Characteristics
II Terminal Facilities Descriptions
III Terminal Operations

B. General Information

I Intermodal
II Economic Influences

Atchison, Topeka and Railway Company
M.A. Brieschke
Manager - Intermodal Sales & Services
80 East Jackson Boulevard
Chicago, Ill. 60604
(312) 427-4900
Tuesday, July 1, 1980, 1:30 p.m.
Ronald E. Morris - Interviewer

The Decision Group

The Decision Group

Contract DTRS-57-80-C-0031
DGI-R-620-80-1 (R 630)

INFORMATION ISSUES

A. Terminal-Specific Information

Please answer each of the following questions for each of the economic zones (E.Z.) your railroad serves. The 16 focal cities which comprise the sample are listed in Exhibit A.

I. Economic Zone (E.Z.) Characteristics

1. What manufactured products originate within each E.Z. served by your railroad?

2. Estimate the percentage of manufactured products which originate/terminate at each E.Z. served by your railroad:

   a. by rail _____% originate/_____% terminate

   b. by TOFC _____% originate/_____% terminate

   c. by truck _____% originate/_____% terminate

3. How many shipper sidings and motor carrier terminals are located within each E.Z. served by your railroad?

4. To what extent are the principal manufactured products which originate in each E.Z. served by your railroad amenable to piggyback movement?

II. TOFC Terminal Facilities Descriptions

1. Manner of loading/unloading?

2. Number of employees normally assigned to daily:

   a. TOFC operations _____

   b. trailer pick-up and delivery _____

3. Number of tractors assigned for:

   a. spotting/hostling trailers

   b. trailer pick-up and delivery _____

FIGURE 4. DISCUSSION GUIDE FOR CONFERENCES WITH TRANSPORTATION INDUSTRY OFFICIALS

FREIGHT TERMINALS OPERATING ENVIRONMENT STUDY

Contract DTRS-57-80-c-0031

DISCUSSION OUTLINE FOR CONFERENCES

WITH

TRANSPORTATION INDUSTRY EXECUTIVES

DGI-MC-620-80

A. Terminal-Specific Information

I Economic Zone Characteristics
II Terminal Facilities Descriptions
III Terminal Operations

B. General Information

I Intermodal
II Economic Influences

Pilot Freight Carriers, Inc.
Mr. William B. Duncan
Executive Vice President
Operations & Engineering
P.O. Box 615
Winston-Salem, North Carolina 27102
(919) 722-3421
Wednesday, July 2, 1980, 9:00 a.m.
Karen S. Merrill - Interviewer

The Decision Group

The Decision Group

Contract DTRS-57-80-C-0031
DGI-MC-620-80-1

INFORMATION ISSUES

A. Terminal-Specific Information

Please answer each of the following questions for each of the economic zones (E.Z.) your firm serves. The 16 focal cities which comprise the sample are listed in Exhibit A.

I. Economic Zone (E.Z.) Characteristics

1. How many regulated motor carriers transport manufactured products into or out of each economic zone served by your firm?

2. What manufactured products originate within each E.Z. served by your firm?

3. Estimate the percentage of manufactured products which enter each E.Z. served by your firm:

   a. by truck _____%

   b. by rail _____%

   c. by TOFC _____%

4. Estimate the percentage of manufactured products which are transported out of each E.Z. served by your firm:

   a. by truck _____%

   b. by rail _____%

   c. by TOFC _____%

5. What could be done to improve operations (e.g., to improve motor carrier profitability and shipper/consignee satisfaction) between terminal and shipper/consignee within each E.Z. served by your firm?

II. Terminal Facilities Descriptions

1. Interior floor area _____ square feet

2. Number of doors/loading docks _____

FIGURE 5. DISCUSSION GUIDE FOR CONFERENCES WITH MOTOR CARRIER INDUSTRY OFFICIALS

4. THE CURRENT ENVIRONMENT WITHIN SURFACE FREIGHT TRANSPORTATION COMMUNITY

4.1 MODAL CARRIERS ARE MANAGED BY TRANSPORTATION EXECUTIVES

The business climate within the surface freight transportation community in 1980 is as different from that which existed a quarter century ago as post World War I Europe was from Europe at the turn of the century. Transportation firms have metamorphosed from being enclaves of self-sufficient executives who learned management from their immediate predecessors and who flaunted a restricted range of interests and concerns. In this the last quarter of the twentieth century, transportation firms have become sophisticated and efficient corporate entities. Decisions are made only after objective evaluation of factual data and realistic market projections. The days of institutionalized memories of past negative experiences with certain competitors, suppliers and customers are ending. With that ending, the day of transportation corporation managers who are businessmen, first, and modal advocates, second, is dawning.

The management principles, business objectives and operating policies of both the domestic rail and motor carriers have changed dramatically since the 1950's: When "piggyback" service emerged as an innovative experiment, the major railroads were still largely controlled by individuals with strong personalities. Each railroad reflected in its managers, its practices, and its services a determined, identifiably unique corporate identity. Railroad management was largely inbred, a fact which--while offering the distinctive benefits of experienced, concerned managers--acted to sustain the rail industry's historical disdain for the federal government, for the motor carrier industry, for long range planning, for objective market analysis, and (perhaps most importantly) for critical self-evaluation.

- require marketing and sales personnel to know as much about each customer's needs, practices, and problems as that customer's traffic manager;
- consider the other mode as filling an essential, complementary role;
- approach carriers of the other mode to explore and develop new intermodal business which is denied to each separately.

4.2 INTERMODAL MOVEMENT AND HANDLING OF MANUFACTURED PRODUCTS

Distribution and Traffic managers came to the realization during the 1950's that manufactured products which had customarily moved in boxcars could, in many instances, be transported more cost-effectively in highway trailers and in intermodal containers. Railroad marketing professionals responded to shipper initiatives which specified or requested intermodal transport of its products. Examination of the costs and implications of moving manufactured products either in boxcars or in intermodal trailers and containers isolated four factors which weighed the analysis heavily in favor of developing and offering shippers the intermodal alternative. These factors were: (1) the greater ease of loading and unloading trailers and containers, (2) the reduced incidence of damage and pilferage in transit and in classification yards of commodities inside trailers and containers, (3) the advantage of more frequent shipments to both manufacturers and consumers because of the reduced volume of intermodal-size units, (4) the ability to attract customers lacking rail sidings or who are located outside the rail carrier's single-mode market areas because of highway mobility beyond the railhead.

The railroads today are developing and marketing intermodal traffic with their own or with leased trailers and containers and are establishing long-term working arrangements with regulated motor carriers between which the rail carrier can profitably act as a bridge. Neither the motor nor the rail carriers could see any possible value in the establishment

4.3 THE CURRENT INTERMODAL OPERATING ENVIRONMENT

An Overview

The ability of the dominant railroad motor carriers to predict and measure profitability, and thereby manage and allocate corporate resources most effectively, can be traced to a large degree to increased reliance on data processing facilities and expertise. In-house or contract-service data management and communications capabilities assure real-time awareness of the location and estimated delivery schedule for all freight within each carrier's system. These carriers should realize a decided advantage as deregulation reshapes the surface transportation industry into a price-competitive environment where statistically-derived pricing will act to determine market dominance.

From the Rail Carriers' Perspective

Railroad intermodal traffic managers no longer react to competitor initiatives. Instead, they base their decisions, planning and recommendations to policy-level management upon market analyses and upon objective determinations of shipper needs, expectations, long term plans, and corporate commitment to intermodal utilization.

Recognizably, those railroaders who pioneered the novel, experimental intermodal alternative during the 1930's, 40's and 50's had to rely on instinct, intuition and perseverance. Without such individuals, progress would be impossible. However, once the new direction has been established, and the new alternative has been demonstrated to be both viable and competitive, the pioneers must yield to the professional specialists. This transition has been completed within the rail industry. As a result Class I railroads, today, share a common thread of management expertise and professionalism in their intermodal freight marketing and sales staffs and all major rail carriers earn a profit from, and realize a return on investment for intermodal freight services.

Movement of trailers and intermodal containers in corridors on dedicated, scheduled TOFC/COFC trains connecting regional hubs which balanced freight traffic is the current marketing motif among the major rail carriers.

From the Motor Carriers' and Freight Forwarders' Perspective

The regulated motor carriers have earned recognition within the investment community for their business and technological sophistication. Financial analysis has become the basis for formulating service and capital investment strategies. Evaluation of the profitability of traffic lanes against corporate and industry indices has supplanted the traditional fixation on traffic volume and the cost of terminal operations.

The most profitable motor carrier shipments weigh between 7,000 and 15,000 pounds. This is also the range within which freight forwarders are most competitive. At distances of up to 1300 miles the cost of moving freight by truck is less than for intermodal transport. Beyond this range, however, the cost of rail intermodal movements levels off and declines. For example, the average cost per trailer mile (regardless of distance) for a roadbound move is one dollar;* whereas a loaded trailer can move 2,000 miles TOFC for approximately $1400.* An exception is sleeper cabs; but motor carriers are trying to phase out sleepers because of the higher labor costs. Instead they prefer to run relays within an 8-hour day. Sleepers are principally used where the distance between two exchange points is too great for normal operations.

The larger regulated motor carriers which enjoy trans-regional operating authority are adopting the hub concept of strategically spaced major terminals, each supported by a cluster of satellite break-bulk terminals. (See Figure 6). A regulated motor carrier will establish LTL** terminal facilities in medium-size and smaller communities where there exists reasonably balanced freight traffic. The new business is usually acquired at the expense of freight forwarders and commercial agents.

*1979 dollars
**less than truckload

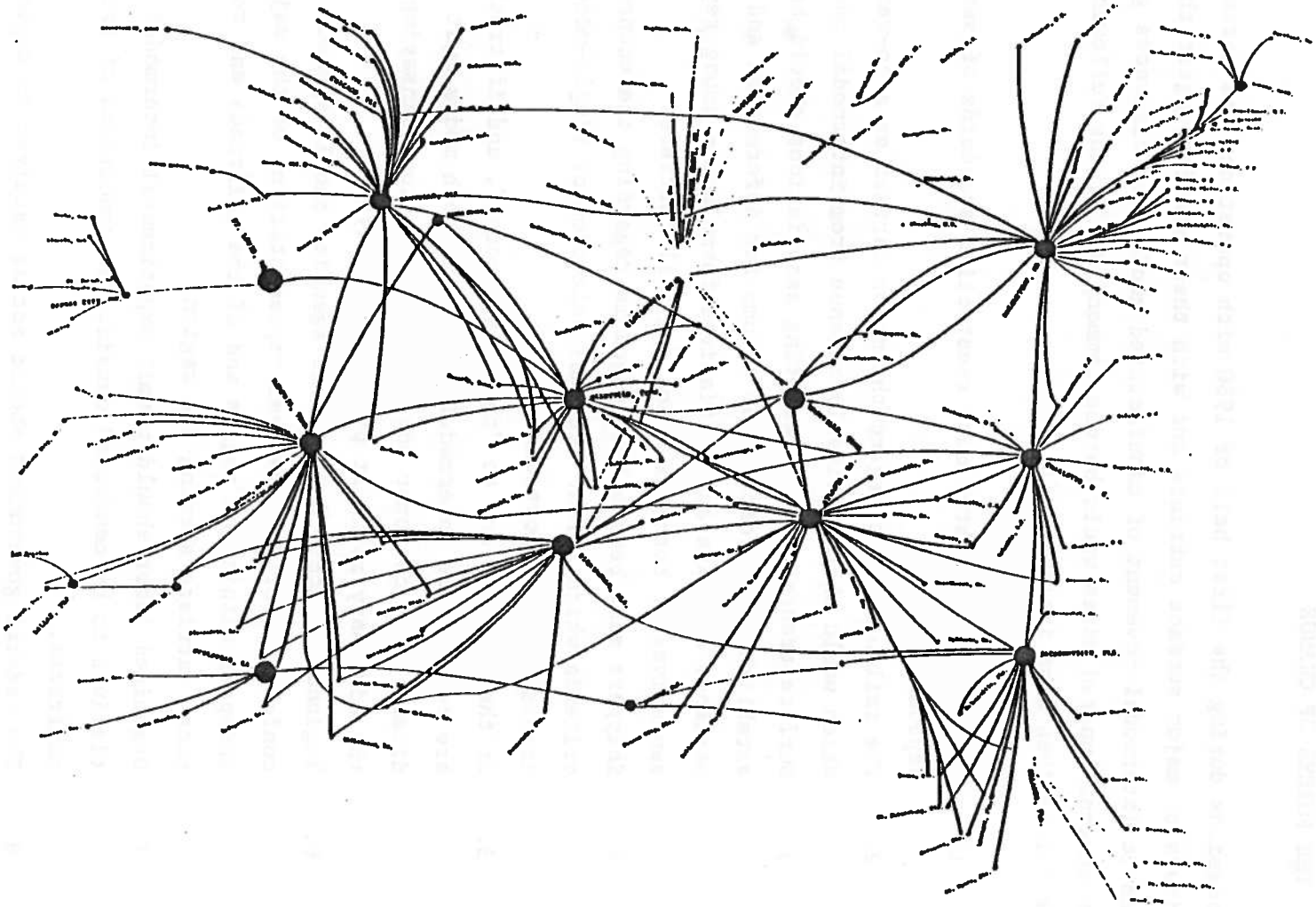


FIGURE 6. AN EXAMPLE OF THE HUB CONCEPT OF BREAK-BULK TERMINALS

9. The federal government should develop a comprehensive Intermodal Services Information package or document for distribution among the chief executive, operations, and financial officers of all regulated motor carriers. This package or document would take the form of a self-teaching vehicle for those policy-level officers who might be (1) too busy to inform themselves on the subject, (2) misinformed on the subject, or (more likely) (3) unaware of the new revenues and increased profits which are potential in intermodal freight movements.

   The package or document would take the form of an Everything A Motor Carrier Executive Needs To Know About Intermodal Surface Transportation.

5.2 THE MOMENTUM OF CHANGE

The nature of the domestic surface freight transportation market over the next decade will bewilder chroniclers of industry operations. By the year 1990, intermodal movements of manufactured goods will have become the norm. The individuals who will effect this change have already established the direction and are presently committed to developing the policies, practices and standards which will result in motor and rail carrier executives planning and acting from a surface transportation--rather than from a modal--perspective.

Unabated depletion of petroleum reserves, coupled with indexing alternative energy costs to petroleum, will channelize transportation and traffic managers into a new, synergystic alliance. Profitability in a free market derives from relative efficiency in the allocation of resources. Since no single mode is the optimal mode of surface transportation for manufactured commodities, intermodal alignment must characterize the surface transportation industry of the 1990's.

There will be a proliferation of contract movements as carriers and shippers develop equitable formulas relating minimum annual volume traffic commitments to pricing concessions. Major shippers will locate new plants in the vicinity of regional corridor hubs to ensure access to intermodal transportation for their products. As transportation costs become an increasingly larger part of a product's consumer cost, many shippers will elect to contract with shippers' agents for those services traditionally performed in-house by traffic departments.

6.3 THE MOTOR CARRIER INDUSTRY

Established trucking firms will experience diversion of both truckload and the heavier LTC traffic to newly-franchised motor carriers. However, the new competition will concentrate their marketing efforts on truckload movements to avoid the large capital investment required to establish break-bulk terminal facilities. The increased dispatch of lightly loaded and empty vehicles will result in a greater imbalance of traffic lanes. the imbalance problem will worsen when predatory rates in the highest volume freight traffic directional corridors preclude the marginal carrier from offsetting the empty backhaul costs.

Faced with a flood of new competition, the general commodity regular route carrier will be compelled to respond with predatory tariffs in those lanes which it considers to be crucial to its sustaining an attractive posture to investors. An established motor carrier cannot be satisfied just with continued viability. It is not enough to survive or even to sustain an achieved market share and level of profitability. The major carriers which depend on shareholder capital for equipment, facilities improvements and expansion must each year deliver a return on investment (ROI) which satisfies shareholder expectations.

		Range	Percent Variance
A.	**Economic Zone**		
1.	Area (square miles	65 to 330	410
2.	Number of Principal Highways		
a.	Interstate	1-4	300
b.	U.S.	0-3	300
c.	State	2-6	200
3.	Number of manufacturing facilities employing more than 100 people . .	12-117	875
4.	Principal manufactured product groups transported into and out of the terminal area	20-39*	
B.	**Motor Carrier Terminals**		
1.	Number of Regulated Motor Carrier Terminals	18-63	250
a.**	Terminal floor space	3400-14500	325
b.**	Number of doors/loading docks	16-58	260
c.**	Number of employees normally assigned to daily:		
	• terminal operations (labor, clerical and supervisory)	10-66	560
	• local pick-up and delivery operations as truck drivers or helpers	7-37	430
d.**	Number of local trucks assigned to pick-up and delivery	1-22	2100
e.	Number of road tractors assigned to committed service to the local terminal (Driver relay operation. All tractors & trailers move among all points on system) . . .	0	0
C.	**Motor Carrier Terminal Operations**		
1.	Farthest local point served by pickup and delivery service (miles) . .	18-75	320
2.	Number of pickup and delivery actions from each motor carrier terminal:. .		
	• daily	105-300	190
	• weekly	540-1500	270
	• monthly.	2150-5900	175
3.	Average tonnage through each terminal monthly:		
	• inbound	800-3350	320
	• outbound	1850-3325	80

*SIC Codes
**per terminal

FIGURE 7. A GENERALIZED CHARACTERIZATION OF THE SURFACE FREIGHT TRANSPORTATION ACTIVITY WITHIN A MEDIUM-SIZE URBAN ECONOMIC ZONE

19 Ordinance and Accessories

20 Food and Kindred Products

21 Tobacco Products

22 Textile Mill Products

23 Apparel and Other Finished Textile Products, Including Knits

24 Lumber and Wood Products, Except Furniture

25 Furniture and Fixtures

26 Pulp, Paper, and Allied Products

27 Printing, Publishing, and Allied Industries

28 Chemical and Allied Products

29 Petroleum and Coal Products

30 Rubber and Miscellaneous Plastics Products

31 Leather and Leather Goods

32 Stone, Clay, Glass, and Concrete Products

33 Primary Metal Products

34 Fabricated Metal Products, Except Ordinance, Machinery and Transportation

35 Machinery Except Electrical

36 Electrical Machinery, Equipment and Supplies

37 Transportation Equipment

38 Instruments, Photo and Medical Goods, Watches, and Clocks

39 Miscellaneous Products of Manufacturing

STANDARD INDUSTRIAL CODES

Highway Research Board, Use of Census Data in Urban Transportation Planning, 1970.

House of Representatives Bill 6418, To amend subtitle IV of title 49, United States, to provide for more effective regulation of motor carriers of property, and for other purposes.

Interstate Commerce Commission, Investigation into the Status of Freight Forwarders, Ex Parte 266, 339.

Journal of Commerce, Transportation Telephone Tickler, 1980.

JWK, International Corp., Roger Creighton Association, Inc. Rail Planning Manual, Vol. 1 - Guide for Decision Makers

Little, Arthur D., Inc. An Assessment of the Population-Mileage Formula for Terminal Areas, October 9, 1975.

Manufacturers Association of Syracuse, Directory of Manufacturers and Products, 1976.

National Highway and Airway Carriers and Routes, 1980.

National Master Freight Agreement and New Jersey-New York Area General Trucking For the Period - April 1, 1979 to March 31, 1982.

National Railway Publication Company, The Official Railway Guide, March/April, 1979.

National Railway Publication Company, Pocket List of Railroad Officials, 4th Quarter 1979.

Norling, A.H., Future U.S. Transportation Needs, 1962.

Official Motor Carrier Inc. Official Motor Carrier Directory, Winter-Spring 1979-1980.

Pennsylvania Power & Light Company, Allentown, PA, A Profile of Allentown, PA.

Pennsylvania Power & Light Company, Allentown, Pa, A Profile of Bethlehem, PA.

Pocket List of Railroad Officials, 4th Quarter 1979.

Pullman Standard, "Railroads in the 70's - A Statistical Review" Railway Age, January 28, 1980.

Railway Age, "Fixed Plant; A Slight Shift in Emphasis"

Railway Age, "Freight Cars: A Fat Backlog Insures Another Good Year", January 28, 1980.

Railway Age, "Fuel Efficiency: TOFC vs Trucks" January 28, 1980.

Railway Age, "The Great Debate Fails to Reassure Shippers", January 28, 1980.

Railway Age, "The Plus Factors Add Up to a Year of Progress" January 28, 1980.

Transportation, Department of, Hearings on Appropriations for 1980.

Welty, Gus, "Traffic Down, Spending Up", Railway Age, January 28, 1980.

West Virginia Department of Highways, West Virginia Highway Mileage Report, 1978.

West Virginia Department of Motor Vehicles, Annual Report, July 1978 - June 1979.

West Virginia Governor's Office of Economic and Community Development, Manufacturing Directory, 1978.

Wyckoff, D. Daryl, Truck Drivers in America, 1979.

Wyckoff, D. Daryl and Maister, David H., The Motor-Carrier Industry, 1977.

APPENDIX A

COMMERCIAL AND SURFACE TRANSPORTATION PROFILES

ECONOMIC ZONES	CITIES
1	Allentown, PA Bethlehem
2	Charleston, WV
3	Decatur, IL
4	Dyersburg, TN
5	Grand Rapids, MI
6	Jackson, MS
7	Richmond, VA
8	Rochester, NY Syracuse
9	Sacramento, CA Stockton
10	San Diego, CA
11	Savannah, GA
12	Spokane, WA
13	Wilmington, DE

ALLENTOWN-BETHLEHEM. PA STATISTICAL PROFILE

- Location: Central-eastern Pennsylvania
- Area (approximate): 154 square miles
- Principal Highways:[a]
  - Interstate

    Route 78
  - U.S. Highway:

    Route 309
  - State Highways:

    Route 29
    Route 100
    Route 145
    Route 191
    Route 412
    Route 512
- Motor Carrier Terminals:[b] 47 (24 located)*
- Railroad Freight Service:[c]
  - Conrail
  - Delaware & Hudson
  - Philadelphia, Bethlehem & New England
- TOFC Terminals:[c]
  - Conrail
- Manufacturing Facilities (Allentown):[a] (Bethlehem):[a]

	Allentown	Bethlehem
100 - 200 employees:	0	11
200 - 300 employees:	10	5
300 - 400 employees:	5	2
400 - 500 employees:	5	2
500 -1000 employees:	9	1
1000 or over	4	1

Source:
a Allentown Economic Development Corp./Bethlehem Chamber of Commerce
b National Highway & Airway Carriers & Routes, 1980.
c The Official Railway Guide, 1979.

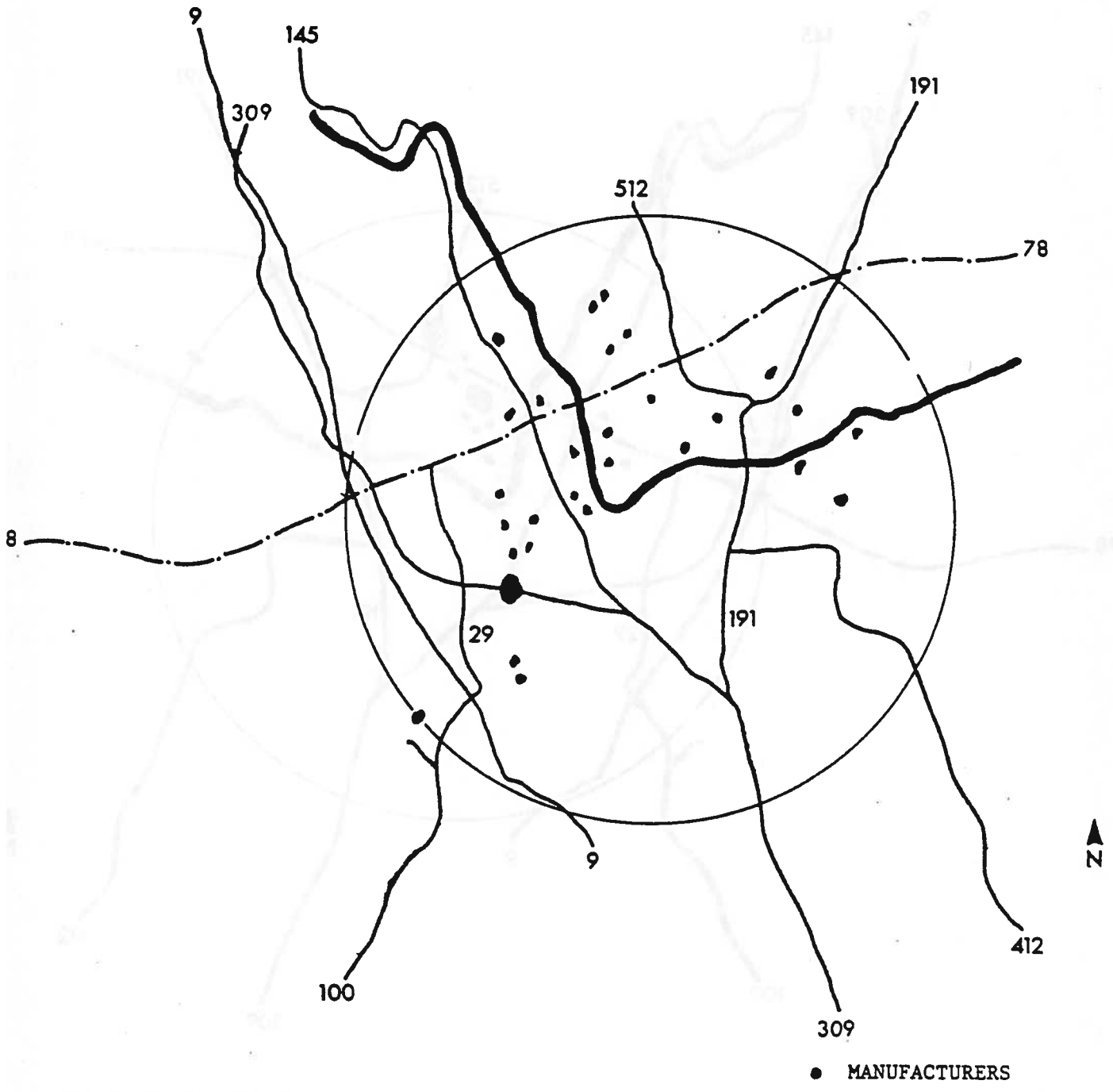
*Addresses either post office boxes or route numbers.

TWENTY LARGEST MANUFACTURING FACILITIES IN THE BETHLEHEM, PA AREA*

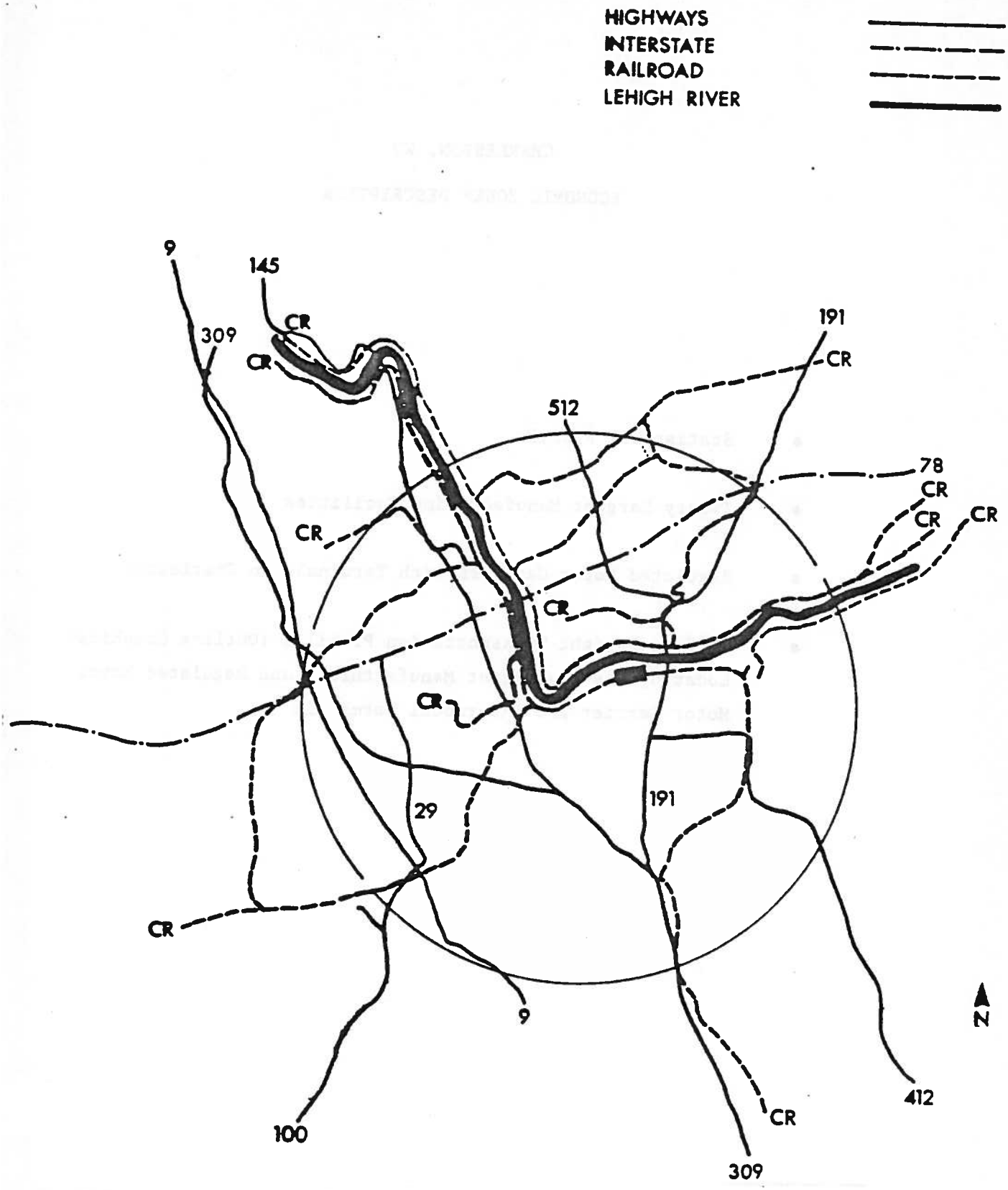
SIC CODE	FIRM
28	Air Products & Chemicals, Inc.
32	Penn Dixie Industries, Inc.
20	Glidden-Durkee
34	Bethlehem Fabricators, Inc.
33	Bethlehem Steel Corporation
38	Fuller Company
37	Mack Truck, Inc.
23	Surefit Products
29	GAF Corporation
20	Arbogast & Bastian, Inc.
35	Bethlehem Corporation
37	Chain Bike Corporation
23	Hellertown Manufacturing Company
26	Boise-Cascade, Allentown Envelope Division
36	Everson Electric Company
38	Guardian Industries
28	Reichard Coulston, Inc.
32	Keystone Portland Cement Company
32	Lone Star Industries
32	Martin Marietta Cement Company

Source: Bethlehem Chamber of Commerce Industrial Directory, February, 1980.

* Listed according to number of employees



SURFACE FREIGHT TRANSPORTATION PROFILE,
ALLENTOWN-BETHLEHEM, PA ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles



SURFACE FREIGHT TRANSPORTATION PROFILE,
ALLENTOWN-BETHLEHEM, PA ECONOMIC ZONE

SCALE: 1 to 250,000

0 _____ 5

Miles

● INTERMODAL TERMINALS

CHARLESTON, WV STATISTICAL PROFILE

- Location: South-central West Virginia
- Area (approximate): 64 square miles
- Principal Highways:[a]
  - Interstate

    Route 64
    Route 77
  - U.S. Highways

    Route 21
    Route 60
    Route 119
  - State Highway

    Route 25
- Motor Carrier Terminals:[b] 22 (12 located)*
- Railroad Freight Service:[c]
  - Chessie System (Chesapeake & Ohio)
  - Conrail
- TOFC Terminals:[c]
  - Chesapeake & Ohio
- Manufacturing Facilities:[d]

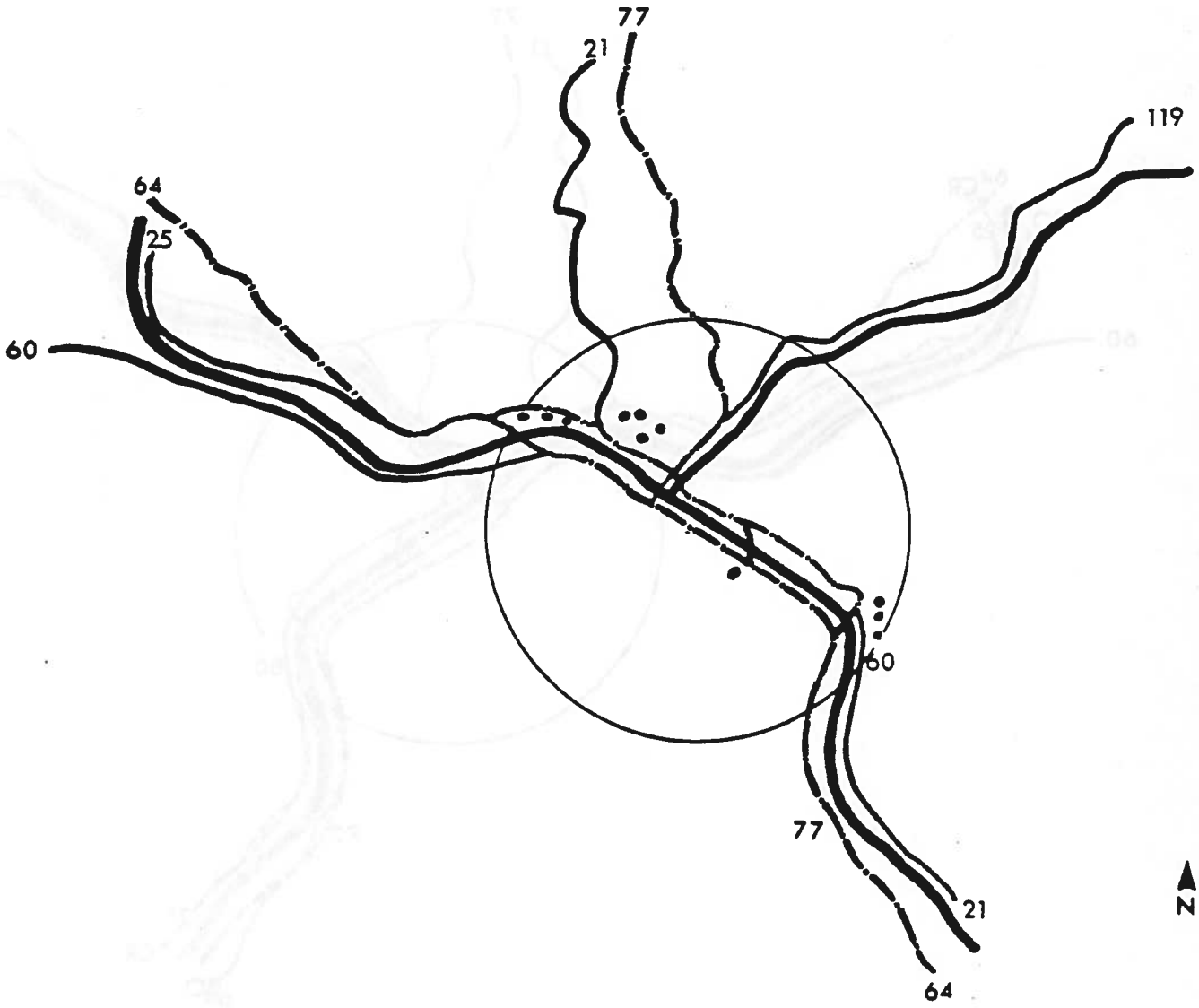
100 - 200 employees:	7
200 - 300 employees:	1
300 - 400 employees:	1
400 - 500 employees:	2
500 -1000 employees:	1
1000 or over	1

Source:
a Charleston Chamber of Commerce
b National Highway & Airway Carriers & Routes, 1980.
c The Official Railway Guide, 1979.

*Addresses either post office boxes or route numbers.

REGULATED MOTOR CARRIERS WITH TERMINALS
IN THE CHARLESTON, WV AREA

Allegheny
Carolina Freight Carriers
Central Transport
Commercial Lovelace
Cook Motor Lines
Eazor Express
Falwell Fast Freight
Gordons Transport
Hall's Motor Transit
Helm's
Johnson Motor Lines
O.K. Trucking
Overnite Transport
Point Express
Reinhardt Transfer
Riss International
Russell Transfer
Smith's Transfer
Suburban Motor Freight
Virginia-Carolina Freight
Wilson Freight
Yellow Freight System



SURFACE FREIGHT TRANSPORTATION PROFILE,
CHARLESTON, WV ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles

DECATUR, IL

ECONOMIC ZONE* DESCRIPTION

- Statistical Profile
- Fourteen Largest Manufacturing Facilities
- Regulated Motor Carriers with Terminals in Decatur
- Surface Freight Transportation Profiles (Outline Graphics) Locating the 14 Largest Manufacturers and Regulated Motor Motor Carrier and Intermodal Terminals

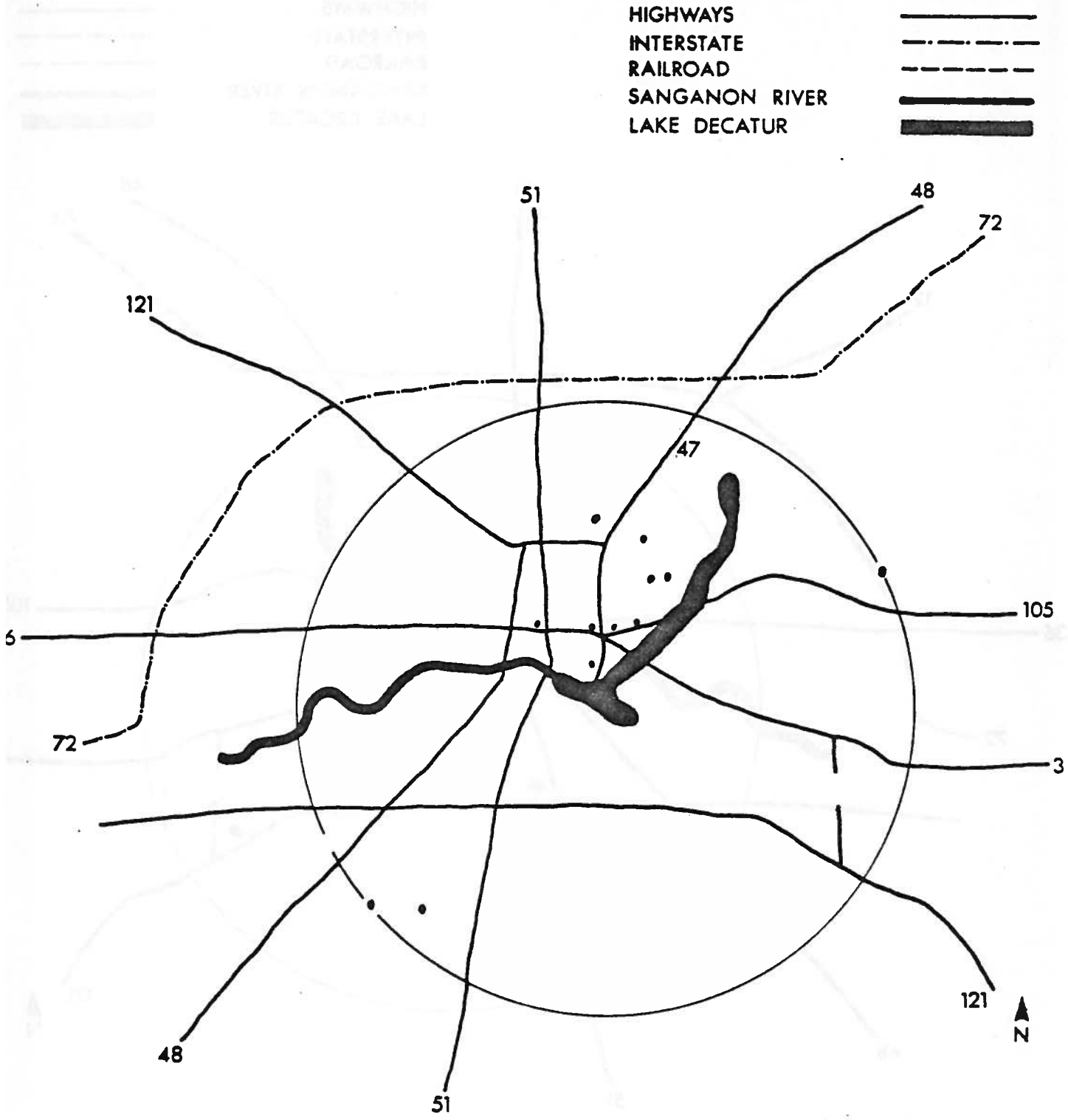
*Note: The economic zone is defined by a circle. The diameter of which connects the sites of the two outermost manufacturer facility(ies) and/or regulated motor carrier or intermodal terminal(s).

FOURTEEN LARGEST MANUFACTURING FACILITIES IN THE DECATUR, IL AREA*

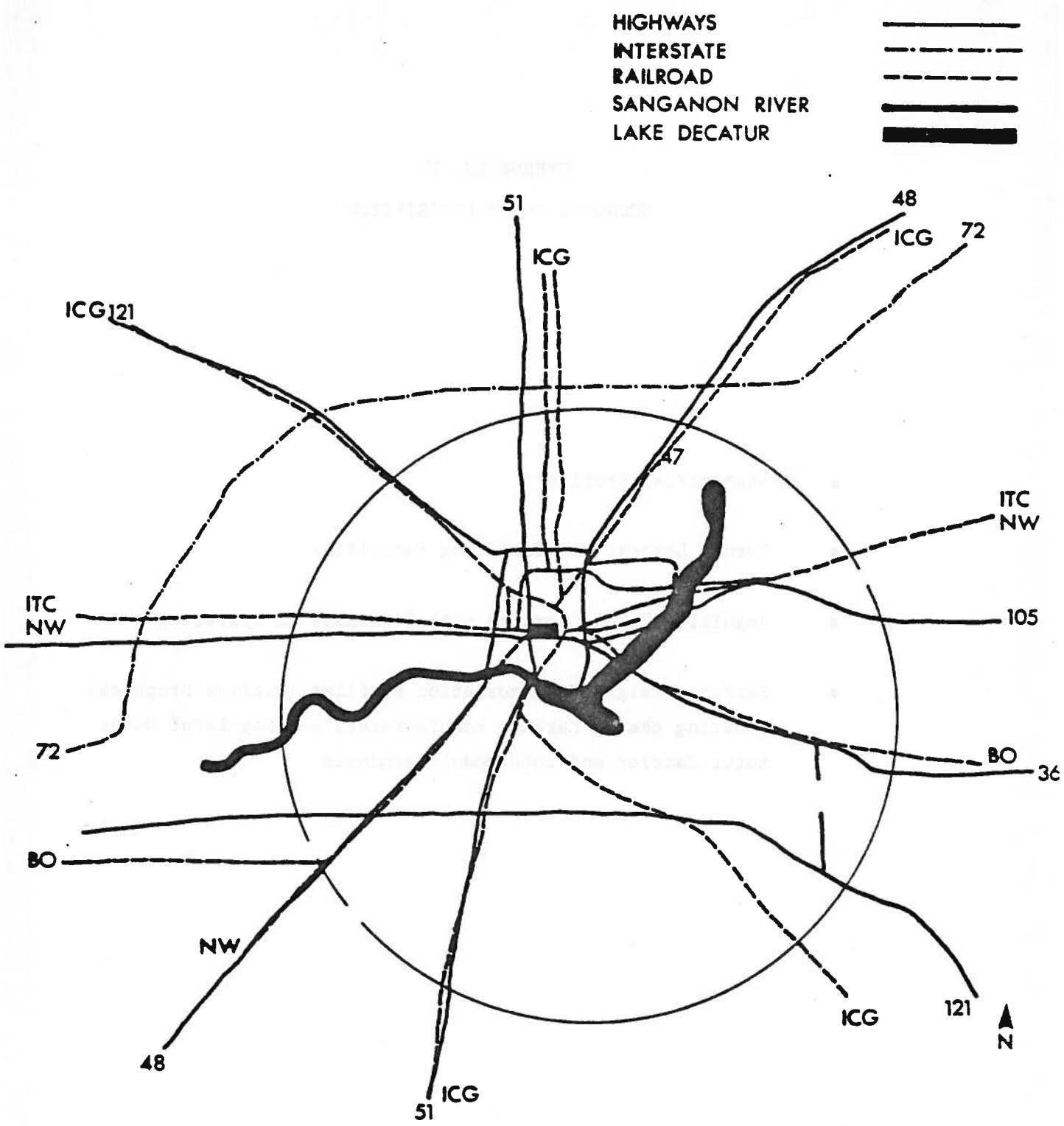
SIC CODE	FIRM
37	Caterpillar Tractor Company
30	The Firestone Tire & Rubber Company
35	Mueller Company
20	Staley Manufacturing Company
20	Archer Daniels Midland Company
37	Norfolk & Western Railway Company
33	Wagner Casting Company
37	York Automotive Products
37	Marvel - Schebler/Tillotson Division
32	PPG Industries
39	Borden, Inc.
36	Essex International Inc.
30	The Grigoleit Company
34	Mississippi Valley Structural Steel

Source: Decatur Manufacturers Directory.

*Listed According to number of employees



SURFACE FREIGHT TRANSPORTATION PROFILE,
DECATUR, IL ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles



SURFACE FREIGHT TRANSPORTATION PROFILE, DECATUR, IL ECONOMIC ZONE

● INTERMODAL TERMINALS

SCALE: 1 to 250,000

0 _____ 5

Miles

DYERSBURG, TN STATISTICAL PROFILE

- Location: Northwestern Tennessee
- Area (approximate): 13 square miles
- Principal Highways:[a]
  - Interstate

    Route 155
  - U.S. Highway

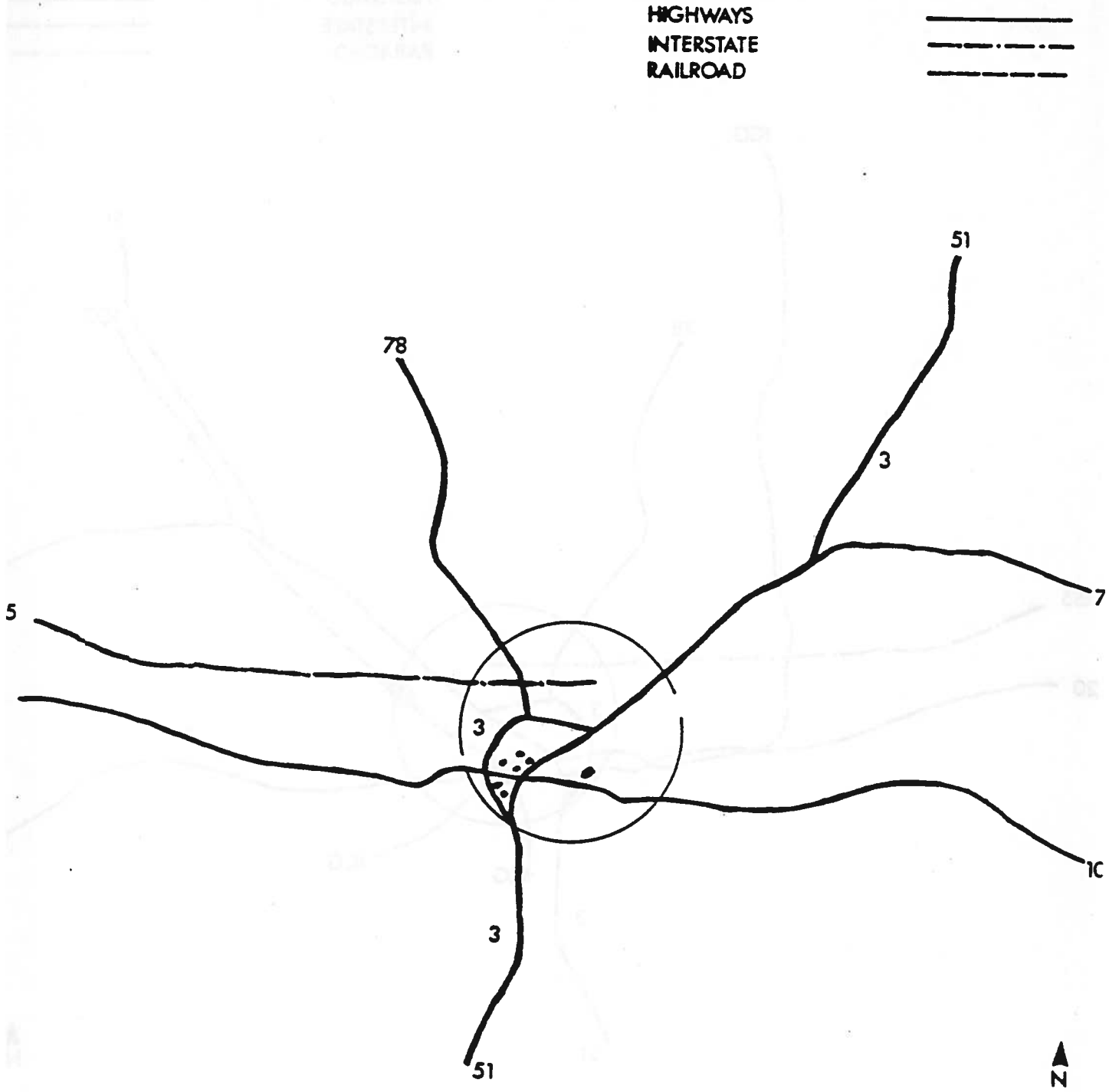
    Route 51
  - State Highways

    Route 20 Route 3
    Route 78 Route 77
    Route 104
- Motor Carrier Terminals:[b] 3 (with 8 additional local carriers)
- Railroad Freight Service:[c]
  - Illinois Central Gulf
- TOFC Terminals:[c]
  - Illinois Central Gulf
- Manufacturing Facilities:[a]
  - 100 - 200 employees: 7
    200 - 300 employees: 3
    300 - 400 employees: 2
    400 - 500 employees: 0
    500 -1000 employees: 4
    1000 or over 4

Source:
a Dyersburg Chamber of Commerce
b National Highway & Airway Carriers & Routes, 1980.
c The Official Railway Guide, 1979.

REGULATED MOTOR CARRIERS WITH TERMINALS
IN THE DYERSBURG, TN AREA

Inman Freight System
S&D Trucking
Sartain Trucking



● REGULATED MOTOR CARRIER TERMINALS

SURFACE FREIGHT TRANSPORTATION PROFILE,
DYERSBURG, TN ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles

GRAND RAPIDS, MI

ECONOMIC ZONE* DESCRIPTION

- Statistical Profile
- Twenty Largest Manufacturing Facilities
- Regulated Motor Carriers with Terminals in Grand Rapids
- Surface Freight Transportation Profiles (Outline Graphics) Locating the 20 Largest Manufacturers and Regulated Motor Motor Carrier and Intermodal Terminals

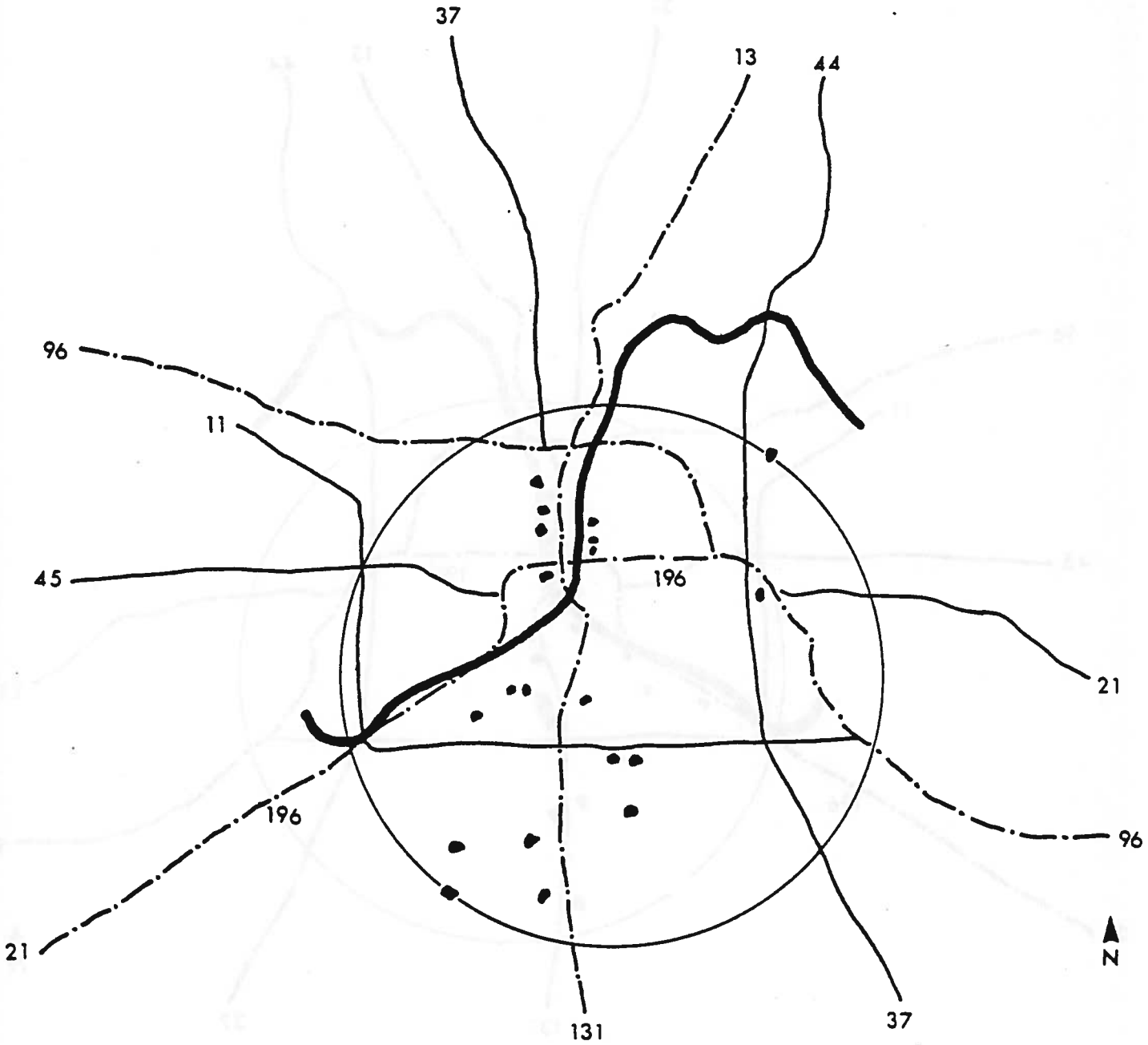
*Note: The economic zone is defined by a circle. The diameter of which connects the sites of the two outermost manufacturer facility(ies) and/or regulated motor carrier or intermodal terminal(s).

TWENTY LARGEST MANUFACTURING FACILITIES

IN THE GRAND RAPIDS, MI AREA

SIC CODE	FIRM
25	Steelcase, Inc.
31	Wolverine World Wide, Inc.
34	General Motors, Fisher Body Division #1
34	Keeler Brass
37	General Motors, Diesel Equipment Division
23	General Motors, Fisher Body Division #2
37	Lear Siegler, Instrument Division
36	Grand Rapids Manufacturing Company
28	Amway Corporation
34	Leigh Products
25	American Seating Company
35	Rapistan Inc.
34	Gulf & Western & Appliance Manufacturing Company
34	The Citation Companies
34	Knape & Vogt Manufacturing
30	Leon Chemical and Plastics
20	Keebler Co.
34	Attwood Corp.
34	Dexter Lock
36	Hi-Ram, Inc.

Source: Regional Grand Rapids Directory of Manufacturers.

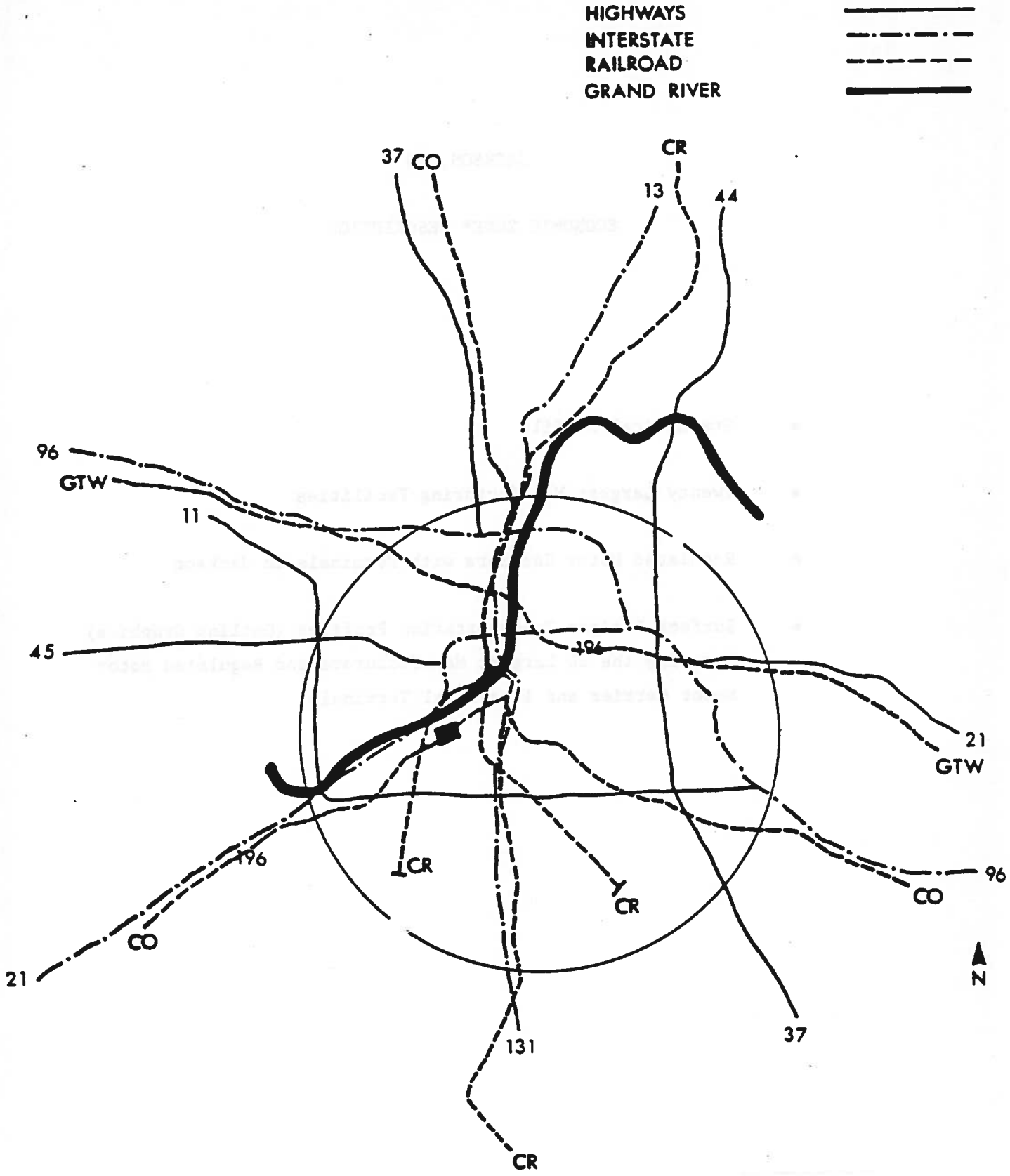


SURFACE FREIGHT TRANSPORTATION PROFILE,
GRAND RAPIDS, MI ECONOMIC ZONE

SCALE: 1 to 250,000

0 _____ 5

Miles



SURFACE FREIGHT TRANSPORTATION PROFILE,
GRAND RAPIDS, MI ECONOMIC ZONE

SCALE: 1 to 250,000

0 _____ 5

Miles

● INTERMODAL TERMINALS

JACKSON, MS STATISTICAL PROFILE

- Location: South-central Mississippi
- Area (approximate): 104.5 square miles
- Principal Highways:[a]
  - Interstate

    Route 20 Route 220
    Route 55
  - U.S. Highways

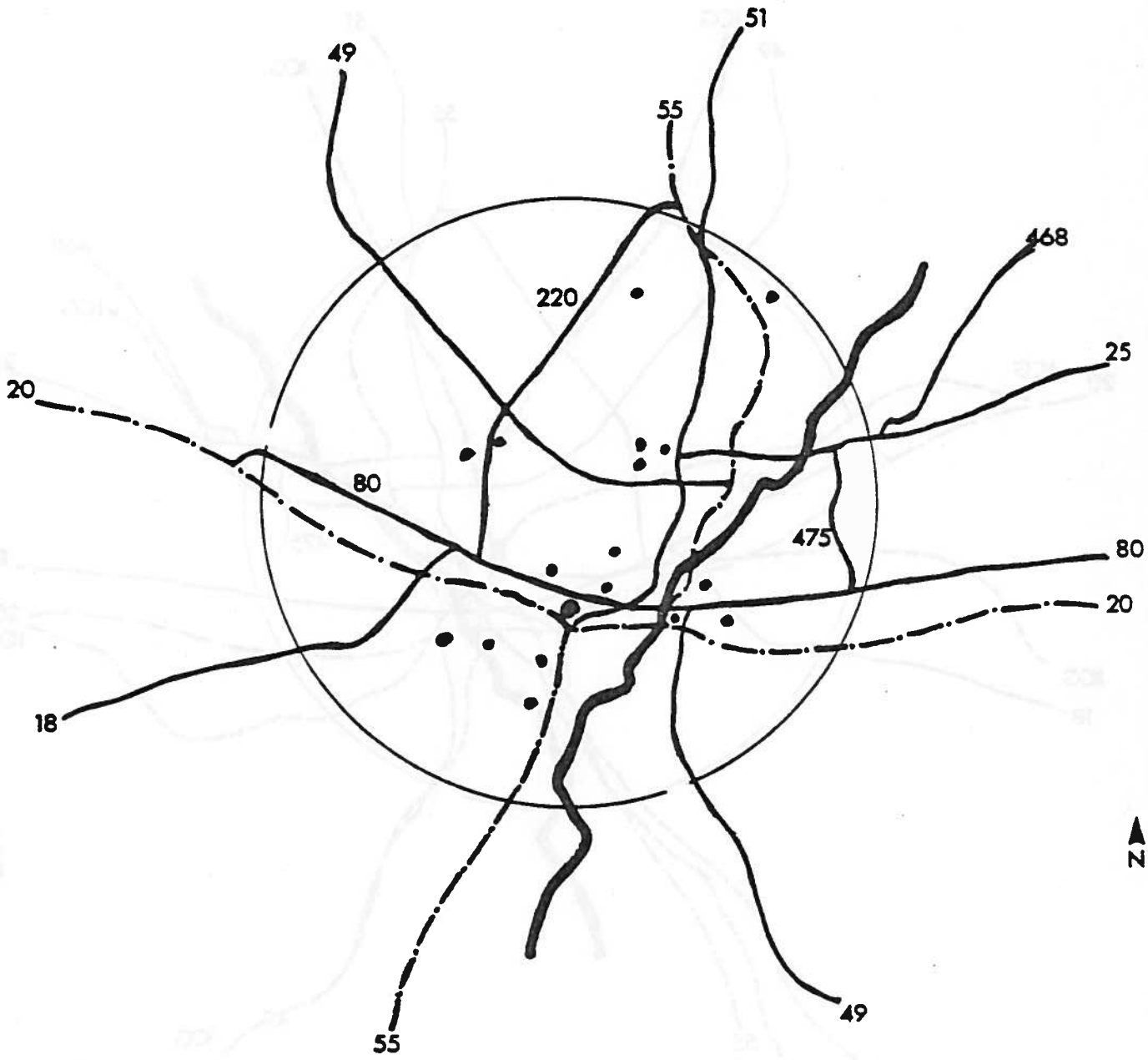
    Route 49
    Route 51
    Route 80
  - State Highways

    Route 18 Route 475
    Route 25 Route 468
- Motor Carrier Terminals:[b] 22
- Railroad Freight Service:[c]
  - Illinois Central Gulf
- TOFC Terminals:[c]
  - Illinois Central Gulf
- Manufacturing Facilities:[a]
  - 100 - 200 employees: 0
    200 - 300 employees: 4
    300 - 400 employees: 7
    400 - 500 employees: 2
    500 -1000 employees: 4
    1000 or over 3

Source:
a Jackson Chamber of Commerce
b National Highway & Airway Carriers & Routes, 1980.
c The Official Railway Guide, 1979.

REGULATED MOTOR CARRIERS WITH TERMINALS
IN THE JACKSON, MS AREA

ABF
Barnes Truck Line
Best Way
Bowman
Campbell 66 Express
Deaton
Ga-Fla-Ala Transport
Gordons Transport
Highway Express
Johnson Motor Lines
Melton Truck Line
Old Dominion Freight
Rebel Motor Freight
Red Ball Motor Freight
Renner's Express
Roadway Express
Robinson Freight Line
Ryder Truck Line
Sharron
Spector Freight System
Thompson
Yellow Freight System



SURFACE FREIGHT TRANSPORTATION PROFILE,
JACKSON, MS ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles

RICHMOND, VA

ECONOMIC ZONE* DESCRIPTION

- Statistical Profile
- Twenty Largest Manufacturing Facilities
- Regulated Motor Carriers with Terminals in Richmond
- Surface Freight Transportation Profiles (Outline Graphics) Locating the 20 Largest Manufacturers and Regulated Motor Motor Carrier and Intermodal Terminals

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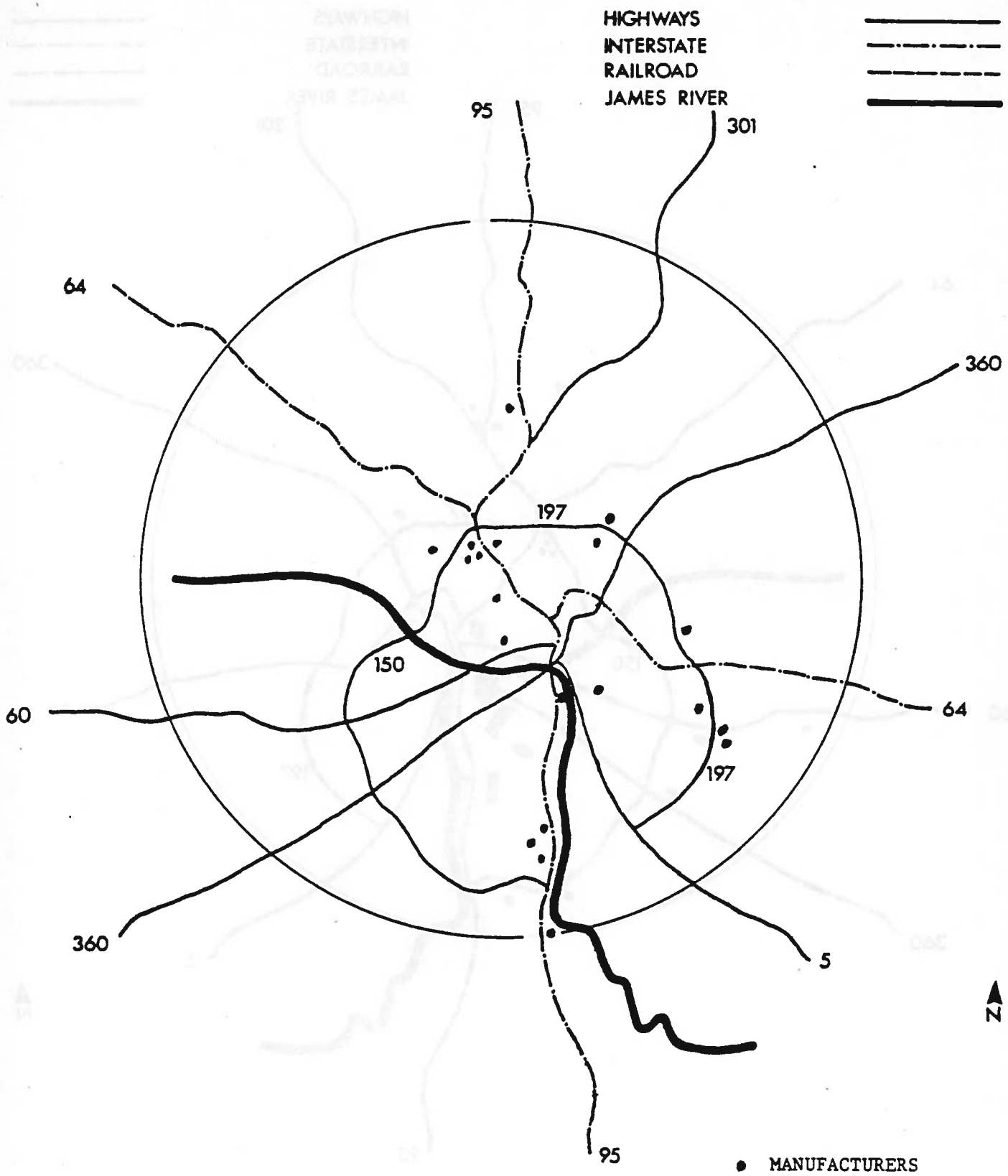
*Note: The economic zone is defined by a circle. The diameter of which connects the sites of the two outermost manufacturer facility(ies) and/or regulated motor carrier or intermodal terminal(s).

TWENTY LARGEST MANUFACTURERS IN THE RICHMOND, VA AREA*

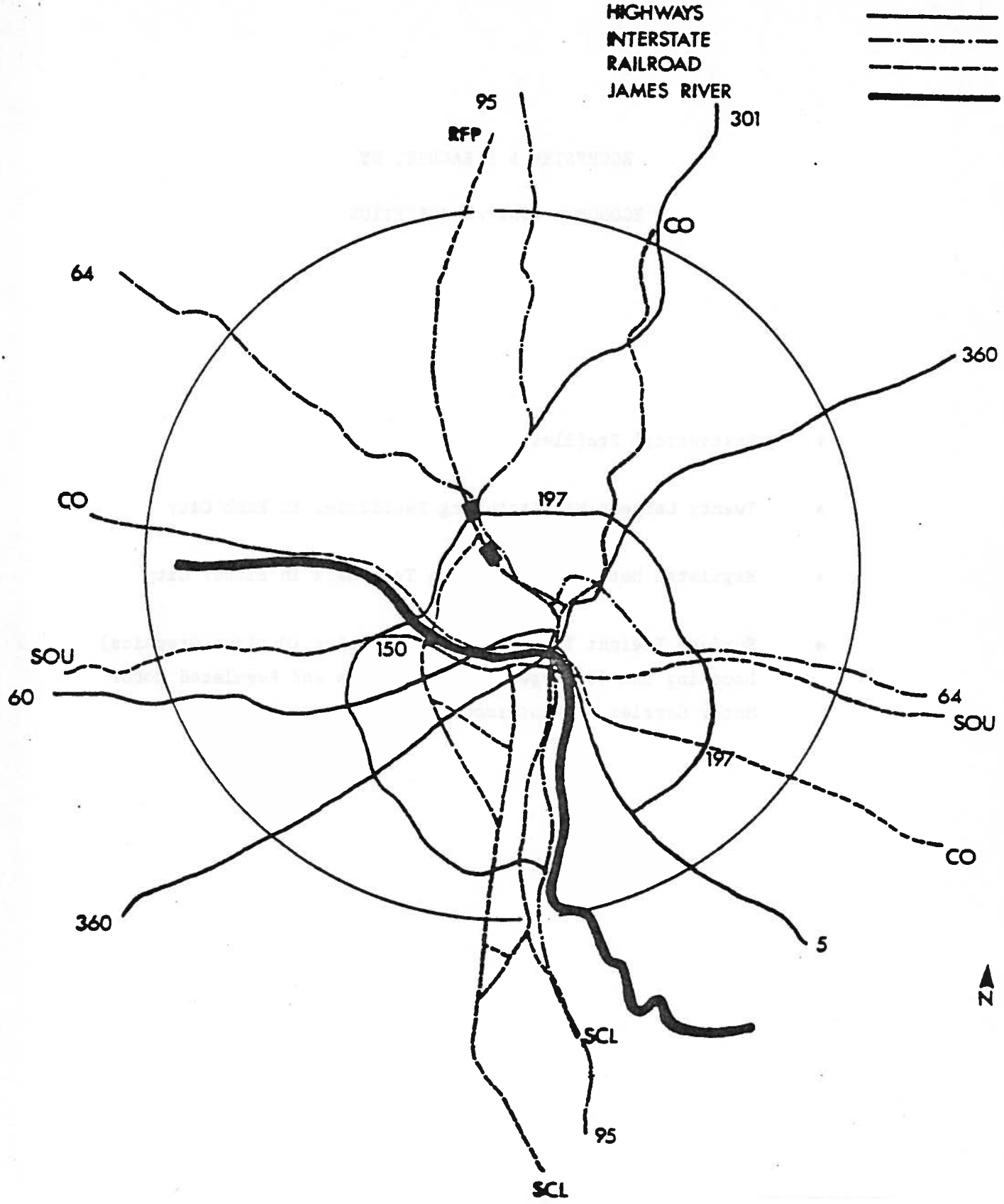
SIC CODE	FIRM
21	Philip Morris
34	Reynolds Metals
28	E.I. DuPont deNemours
22	Allied Chemicals
21	American Brands
36	Western Electric
27	Richmond Newspapers
28	A.H. Robins
20	Holley Farms Poultry
36	General Electric
20	Nabisco, Inc.
26	Westvaco Corporation
20	Interbake Foods, Inc.
23	Carisbrook Industries
25	Miller Manufacturing Company
27	The William Byrd Press, Inc.
34	Richmond Engineering Company
20	ITT Continental Baking Company
23	A.J.D. Cap Corporation
25	Lea Industries

Source: Richmond Chamber of Commerce

* Listed according to number of employees



SURFACE FREIGHT TRANSPORTATION PROFILE,
RICHMOND, VA ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles



SURFACE FREIGHT TRANSPORTATION PROFILE, RICHMOND, VA ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles

● INTERMODAL TERMINALS

ROCHESTER, NY STATISTICAL PROFILE

- Location: Western New York
- Area (approximate): 159 square miles
- Principal Highways:[a]
  - Interstate

    Route 490
  - U.S. Highways

    Route 15
    Route 90
    Route 104
  - State Highways

    Route 18
    Route 31
    Route 33
    Route 47
    Route 65
    Route 252
- Motor Carrier Terminals:[b] 51 (41located)*
- Railroad Freight Service:[c]
  - Chessie System (Baltimore & Ohio)
  - Conrail
- TOFC Terminals:
  - Conrail
- Manufacturing Facilities:

100 - 200 employees:	55
200 - 300 employees:	13
300 - 400 employees:	8
400 - 500 employees:	8
500 -1000 employees:	14
1000 or more	16

Source:
a Rochester Chamber of Commerce
b National Highway & Airway Carriers & Routes, 1980.
c The Official Railway Guide, 1979.

*Addresses either post office boxes or route numbers.

TWENTY LARGEST MANUFACTURING FACILITIES

ROCHESTER, NY AREA*

SIC CODE	FIRM
38	Eastman Kodak Company
34	Garlock, Inc.
38	Bausch & Lomb Inc.
37	General Motors, Delco Products Division
27	Gannett Rochester Newspapers
37	General Railway Signal Company
36	Harris Corp., R.F. Communications Division
35	Alliance Tool Corp.
23	Hickey-Freeman Company
27	Itek Graphic Products
35	Mixing Equipment Company
36	General Electric Company
38	Du Pont De Nemours E.I. & Co., Photo Products Division
20	Genesee Brewing Company
39	Sybron Corp.
39	Case-Hoyt Corp.
28	Pennwalt Pharmaceutical Company
27	Burroughs Products
34	General Circuits Inc.
20	Gerber Products Company

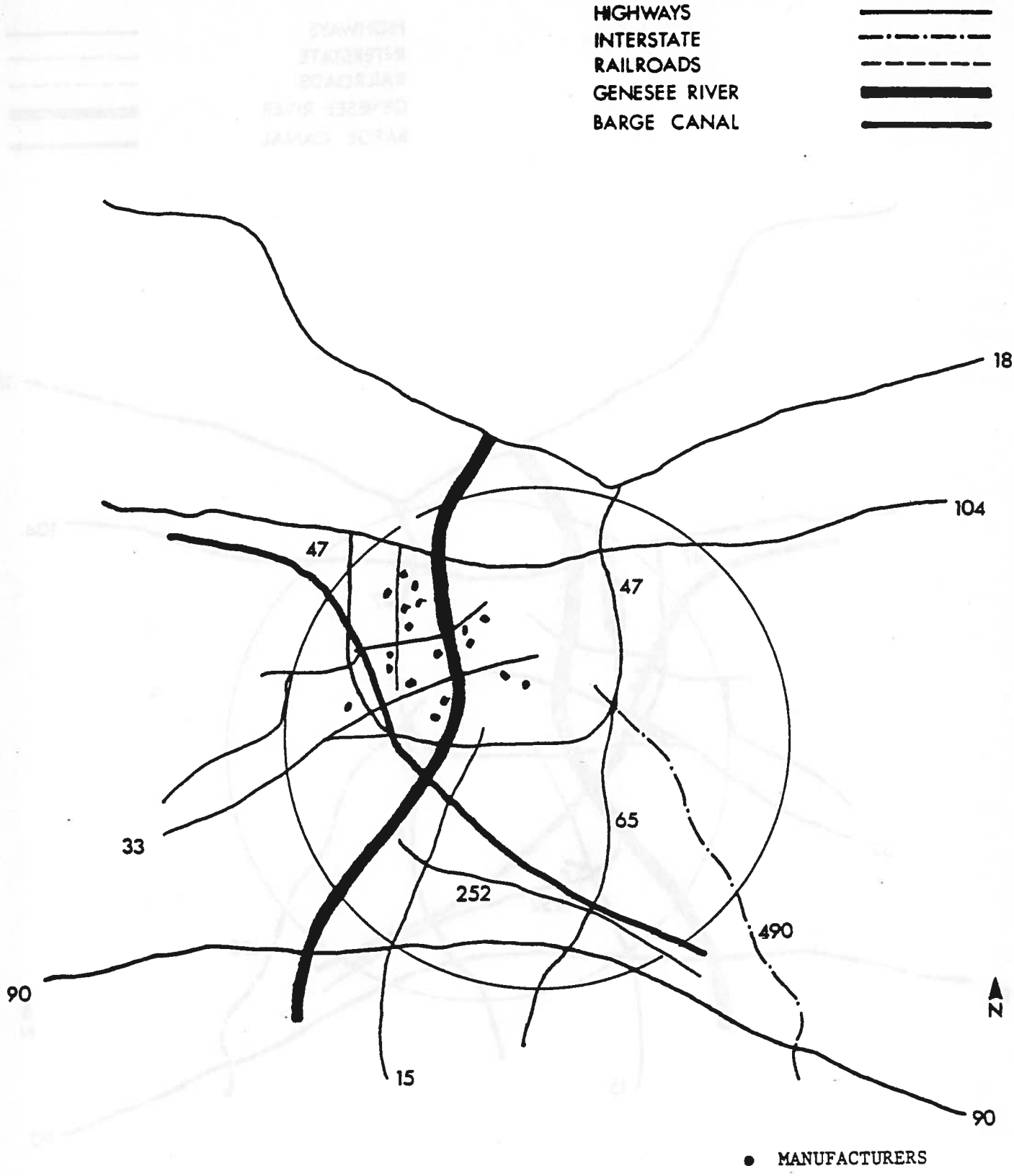
Source: Industrial Directory, Rochester, New York, 1979.

*Listed according to number of employees

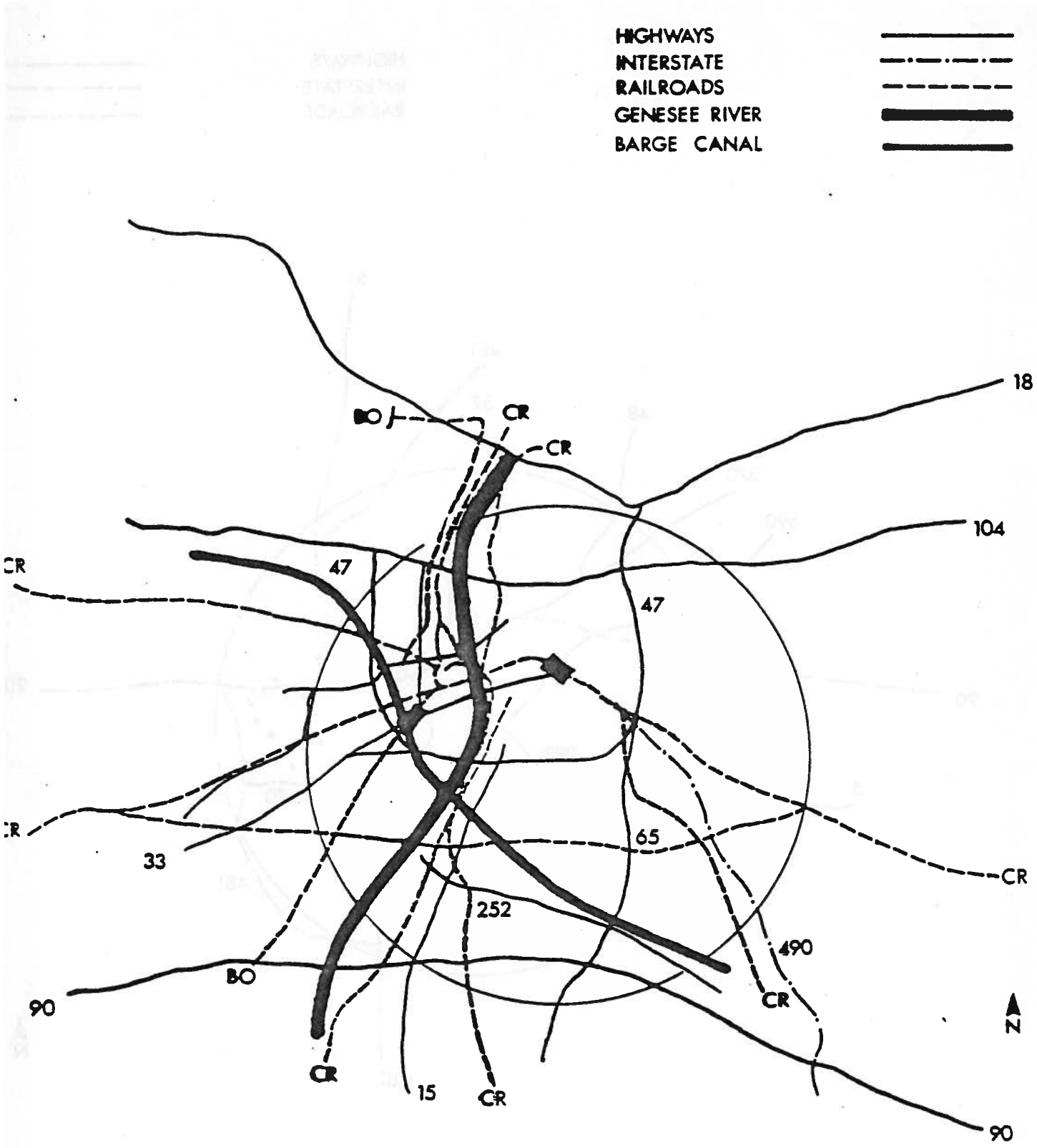
REGULATED MOTOR CARRIERS WITH TERMINALS

IN THE ROCHESTER, NY AREA

ABF
American Freight
American Freightways
Berman Motor Express
Boss Linco Lines
Byrns Motor Express
Canny Trucking
Carolina Freight Carriers
Chief Freight Lines
Consolidated Freightways
Cooper Jarrett
Dick's Auto Express
Dorn's Transportation
Eazor Express
Empire State Motor Express
Gateway Transportation
Hall's Motor Transit
Hemingway Transport
Highway Express
Inland Express
Inter-City Truck Lines
Interstate Motor Freight
Jones Motor
Lapp Express
Lyons Transportation
Maislin Transport Ltd.
Midwest Emery Freight
Motor Freight Express
Mushroom Transportation
Oneida Motor Freight
Pacific Intermountain Express
Penn Yan Express
Pilot Freight Carriers
Preston Trucking
Red Star Express Lines
Roadway Express
Root's Express
Ryder Truck Line
St. Johnsbury Trucking
Schuster Express
Seaway Motor Express
Shay's Service
Spector Freight System
Starkweather Freight
Stott & Davis Motor Express
Taynton Freight System
TIME-DC
Transcon Lines
United Trucking Service
Van Curler Trucking
Wilson Freight
Yellow Freight System

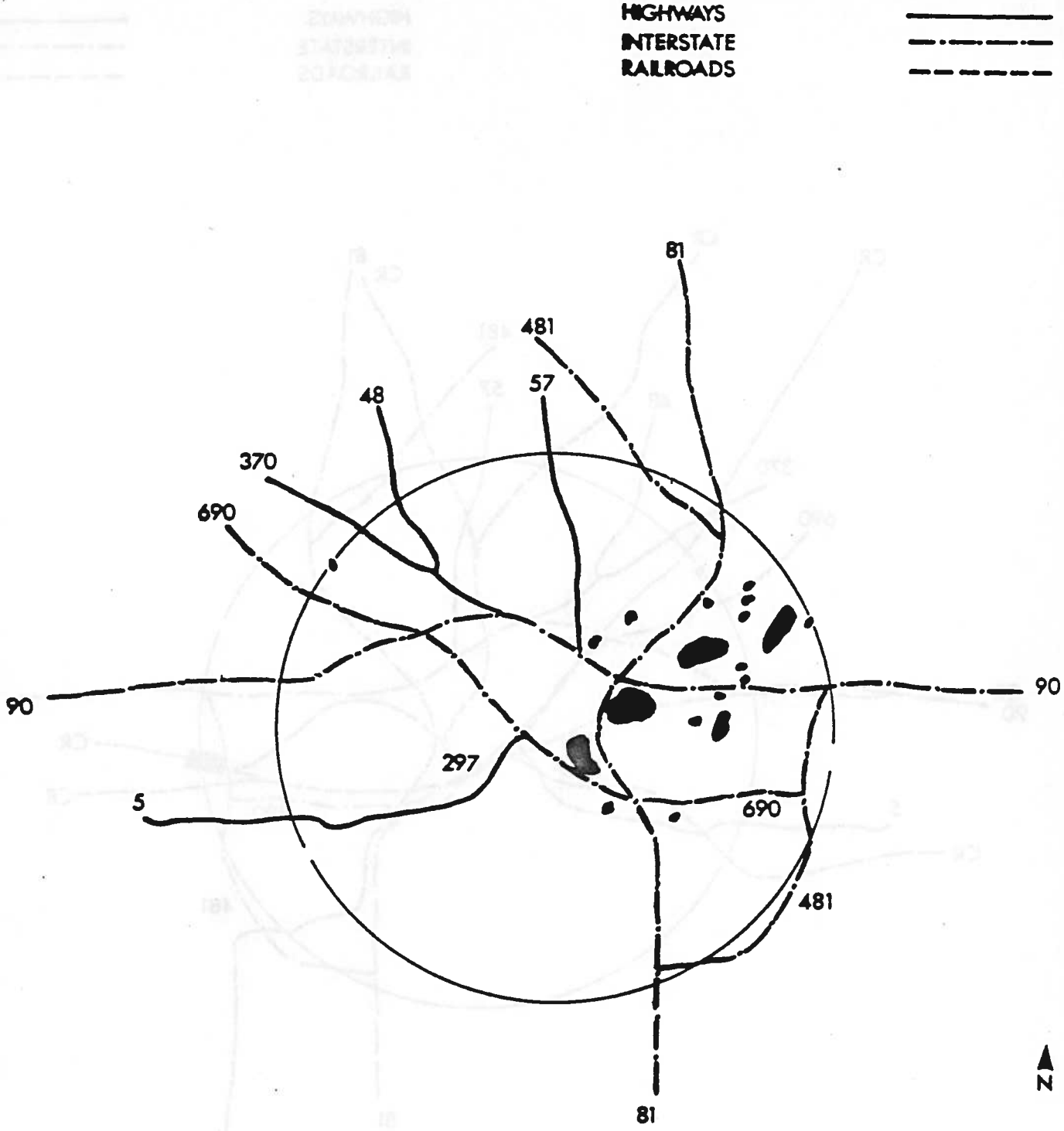


SURFACE FREIGHT TRANSPORTATION PROFILE,
ROCHESTER, NY ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles



SURFACE FREIGHT TRANSPORTATION PROFILE,
ROCHESTER, NY ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles

● INTERMODAL TERMINALS



● REGULATED MOTOR CARRIER TERMINALS

SURFACE FREIGHT TRANSPORTATION PROFILE,
SYRACUSE, NY ECONOMIC ZONE

SCALE: 1 to 250,000

0 _____ 5

Miles

SACRAMENTO & STOCKTON, CA

ECONOMIC ZONE* DESCRIPTION

- Sacramento - Stockton Statistical Profiles
- Twenty Largest Manufacturing Facilities in Each City
- Regulated Motor Carriers with Terminals in Either City
- Surface Freight Transportation Profiles (Outline Graphics) Locating the 20 Largest Manufacturers and Regulated Motor Motor Carrier and Intermodal Terminals in Each City

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*Note: The economic zone is defined by the circle about the city-pair. The diameter of the circle connects the sites of the two outermost manufacturer facility(ies) and/or regulated motor carrier or intermodal terminal(s) serving either city.

STOCKTON, CA STATISTICAL PROFILE

- Location: Central California
- Area (approximate): 78.5 square miles
- Principal Highways:[a]
  - Interstate

    Route 50
  - State Highways

    Route 4 Route 120
    Route 26
    Route 88
    Route 99
- Motor Carrier Terminals:[b] 22 (5 located)*
- Railroad Freight Service:[c]
  - Atchison, Topeka & Santa Fe
  - Central California Traction
  - Southern Pacific
  - Stockton Terminal & Eastern Railroad
  - Union Pacific
  - Western Pacific (Tidewater Southern)
- TOFC Terminals:[c]
  - Atchison, Topeka & Santa Fe
  - Southern Pacific
- Manufacturing Facilities:[a]

100 - 200 employees:	29
200 - 300 employees:	13
300 - 400 employees:	2
400 - 500 employees:	2
500 -1000 employees:	14
1000 or over	2

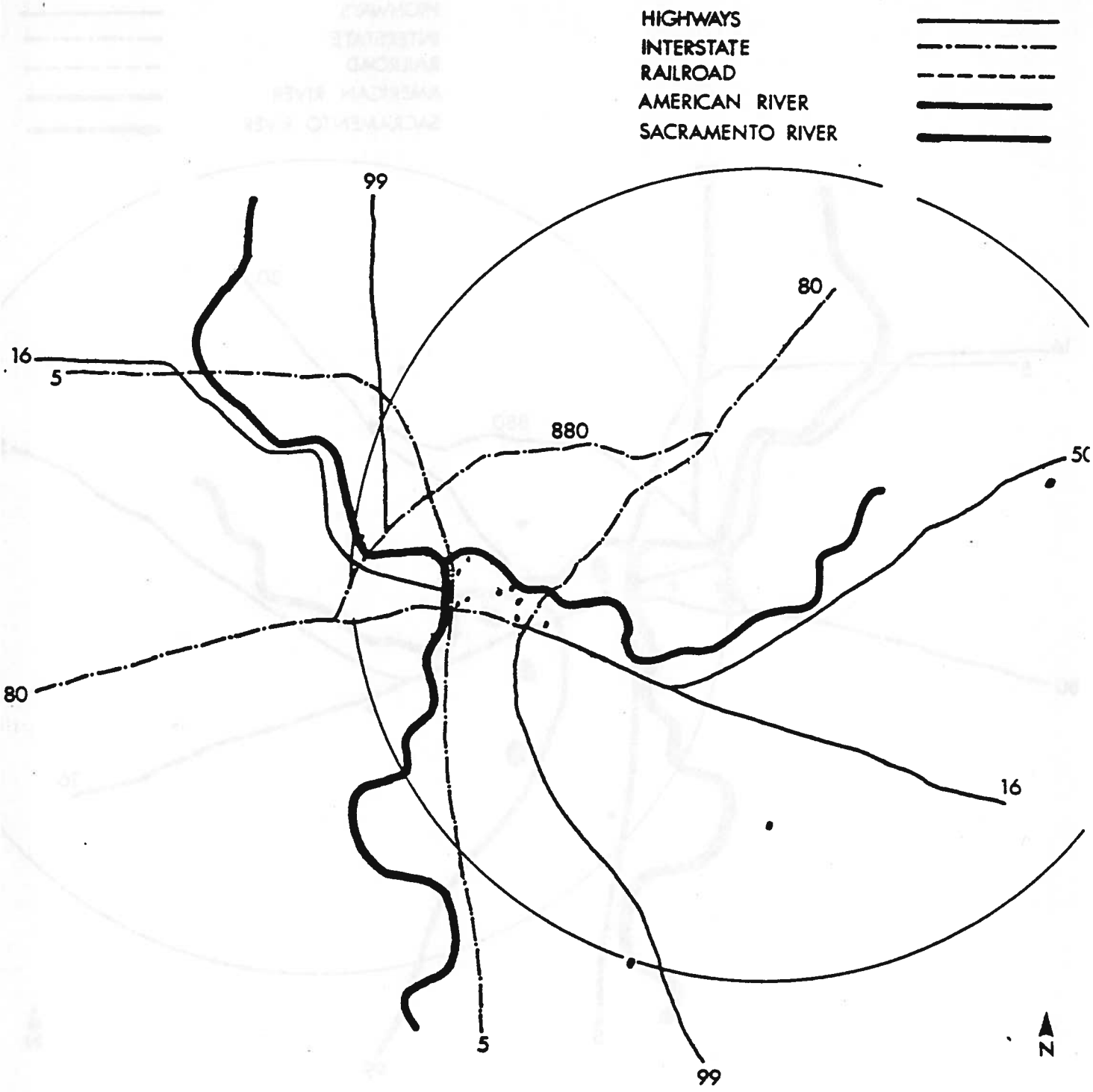
Source:
a Stockton Chamber of Commerce
b National Highway & Airway Carriers & Routes, 1980.
c The Official Railway Guide, 1979.

*Addresses either post office boxes or route numbers.

TWENTY LARGEST MANUFACTURERS

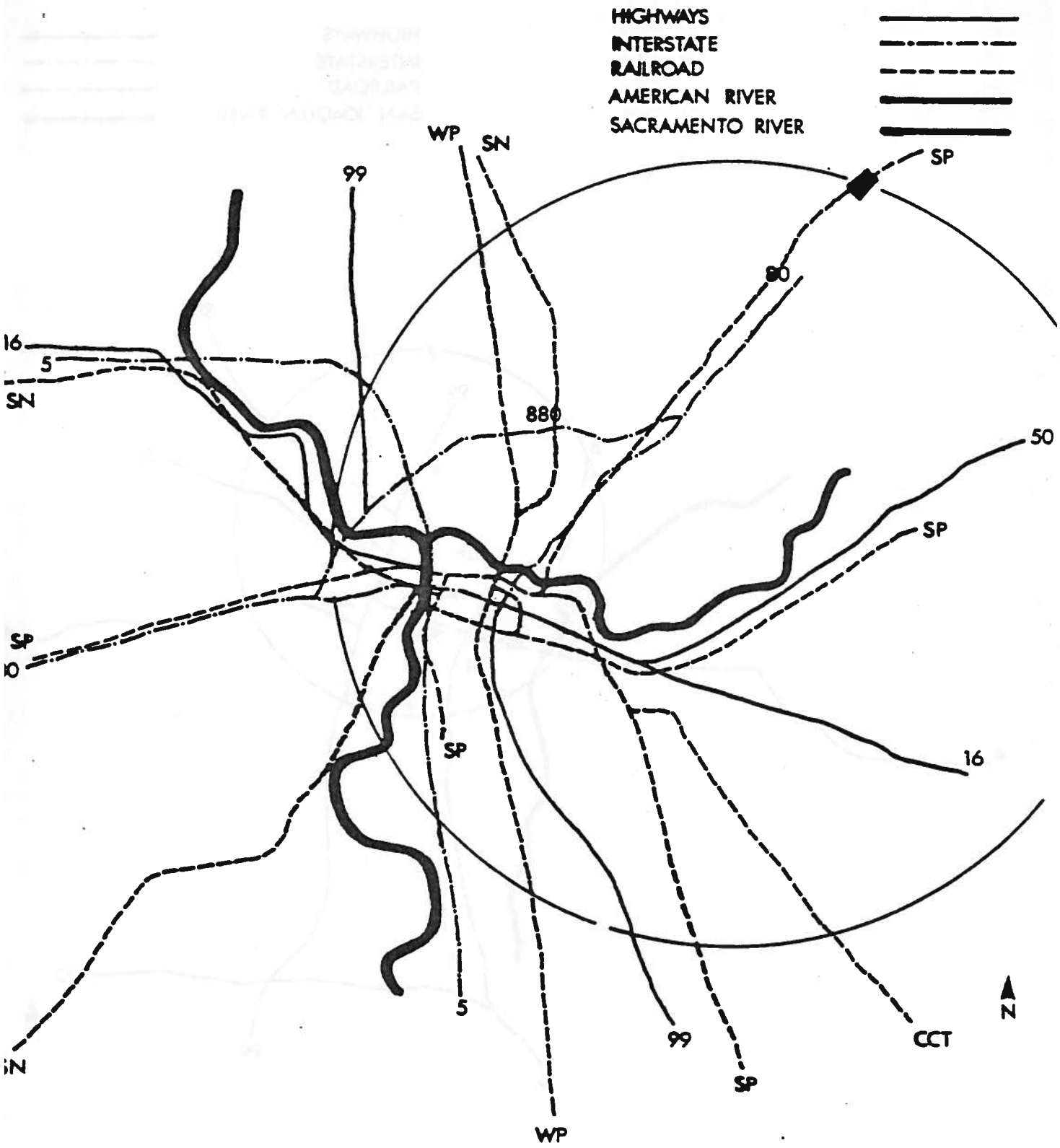
IN THE STOCKTON, CA AREA*

SIC CODE	FIRM
20	Diamond/Sunsweet, Inc.
37	Libbey-Owens Ford Co.
20	Tri/Valley Growers
26	California Cedar Products, Inc.
26	Pacific Paperboard Products
20	Tillie Lewis Foods Inc.
26	Bendix Forest Products, Inc.
39	Johns-Manville Corp.
39	Holt Brothers
27	Ad-Art, Inc.
20	Del Monte
20	Hayre's Egg Producers
20	Safeway Meat Processing
39	Lika Corp.
39	H.H. Robertson Company
35	Marley Cooling Tower Co.
39	Hickinbotham Brothers Ltd.
34	Stockton Door Company
20	Valley Tomato Products Inc.
26	Down River Forest Products, Inc.



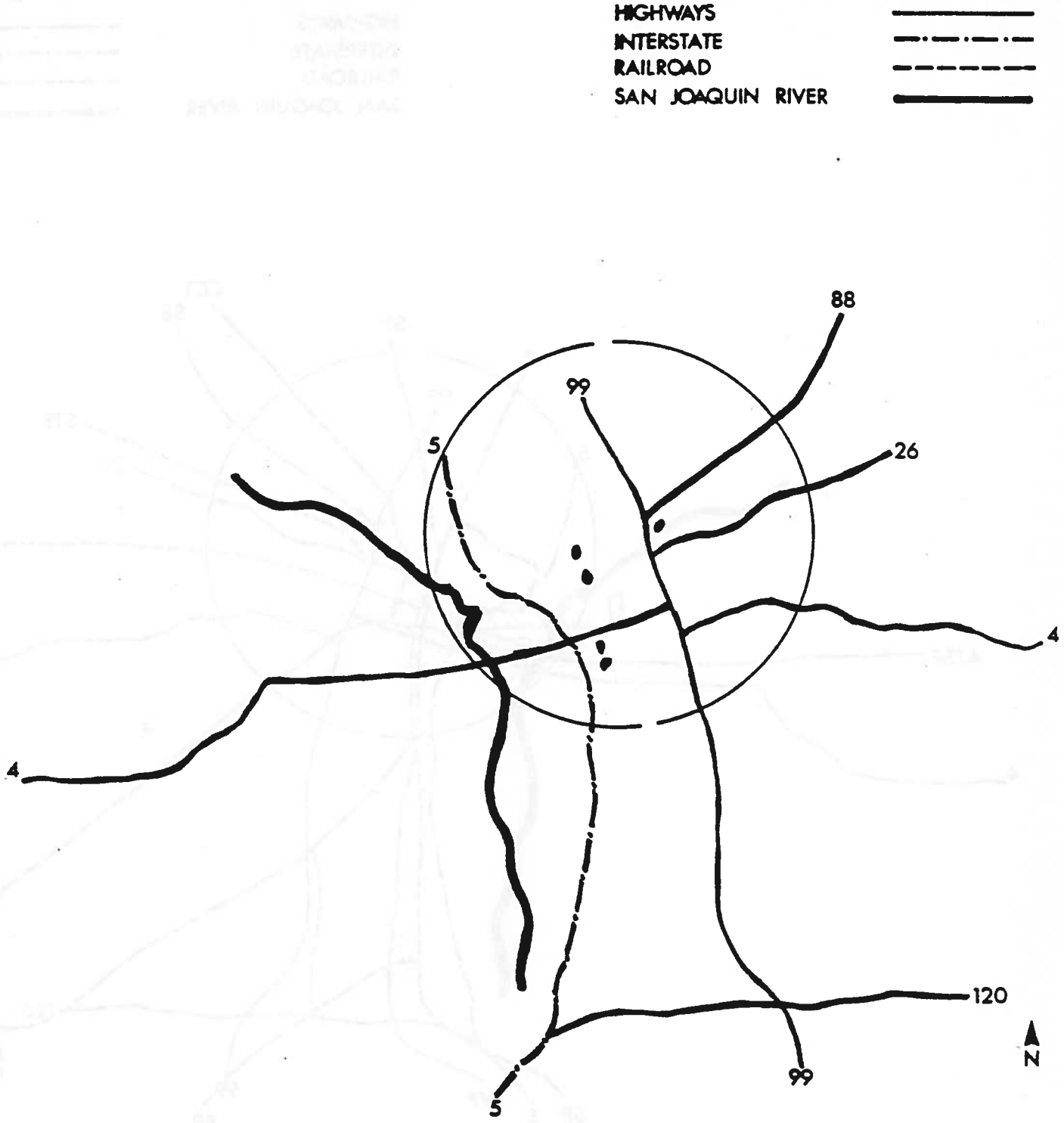
• MANUFACTURERS

SURFACE FREIGHT TRANSPORTATION PROFILE,
SACRAMENTO, CA ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles



SURFACE FREIGHT TRANSPORTATION PROFILE,
SACRAMENTO, CA ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles

● INTERMODAL TERMINALS



SURFACE FREIGHT TRANSPORTATION PROFILE,
STOCKTON, CA ECONOMIC ZONE
SCALE: 1 to 250,000
0 _____ 5
Miles

SAN DIEGO, CA

ECONOMIC ZONE* DESCRIPTION

- Statistical Profile
- Twenty Largest Manufacturing Facilities
- Regulated Motor Carriers with Terminals in San Diego
- Surface Freight Transportation Profiles (Outline Graphics) Locating the 20 Largest Manufacturers and Regulated Motor Motor Carrier and Intermodal Terminals

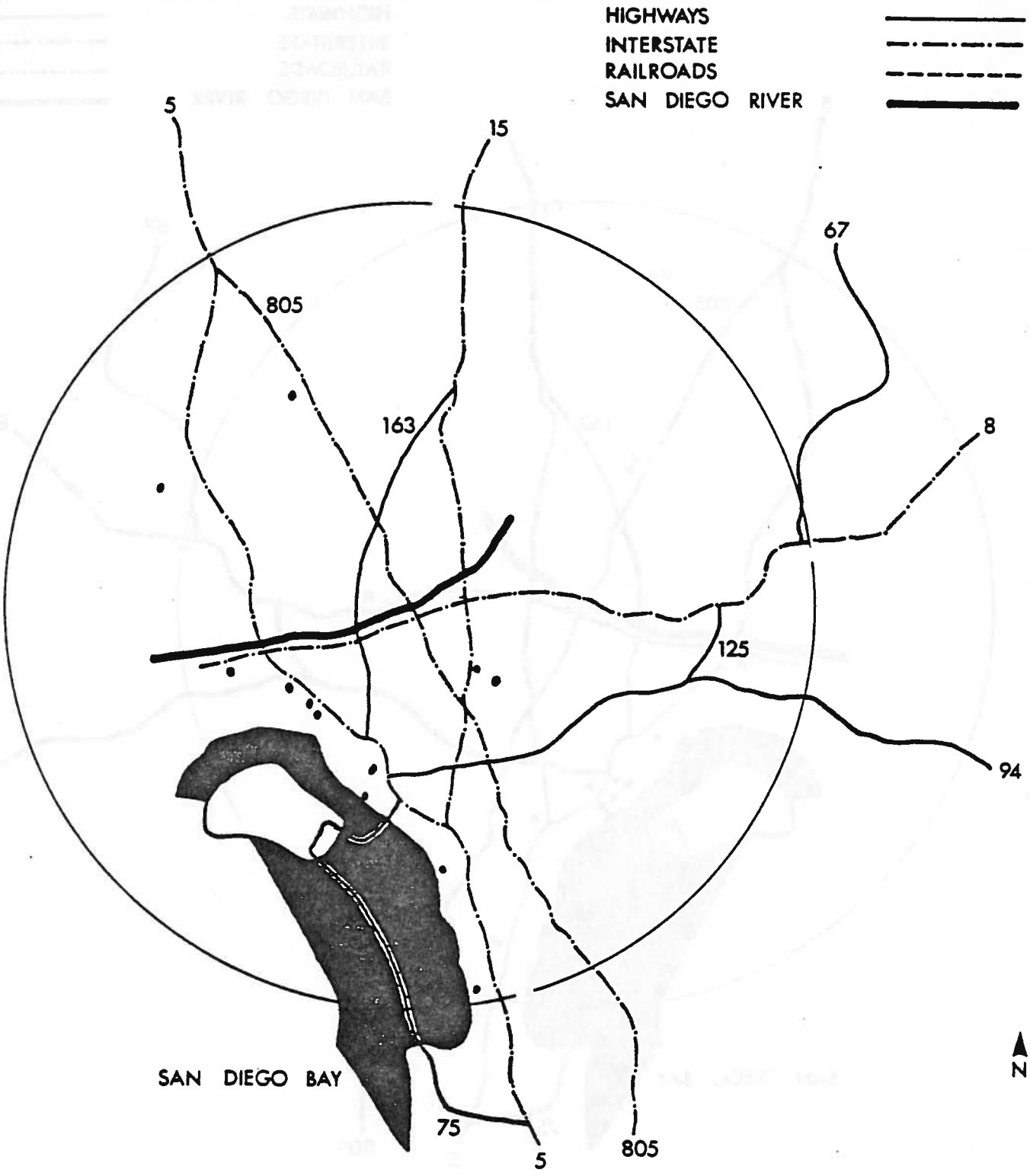
*Note: The economic zone is defined by a circle. The diameter of which connects the sites of the two outermost manufacturer facility(ies) and/or regulated motor carrier or intermodal terminal(s).

TWENTY LARGEST MANUFACTURING FACILITIES IN THE SAN DIEGO, CA AREA*

SIC CODE	FIRM
37	National Steel and Shipbuilding Co.
36	Rohr Industries, Inc.
34	General Dynamics/Convair Division
35	Solar Division/International Harvester
37	Teledyne Ryan Aeronautical
36	Cubic Corporation
35	General Atomic Company
36	National Cash Register Corporation
23	Ratner Corporation
36	General Dynamics/Electronics Division
35	Singer Company/The Kearfott Division
27	Union-Tribune Publishing Company
20	Van Camp Sea Food Company
36	Ametek/Straza
36	Burroughs Corporation
37	Campbell Industries/Marine Division
38	Consyne Corporation
36	Deutsch Company E.C.D.
20	Foodmaker Inc.
38	Hewlett Packard Company

Source: San Diego Directory of Manufacturers, 1978.

*Listed according to number of employees

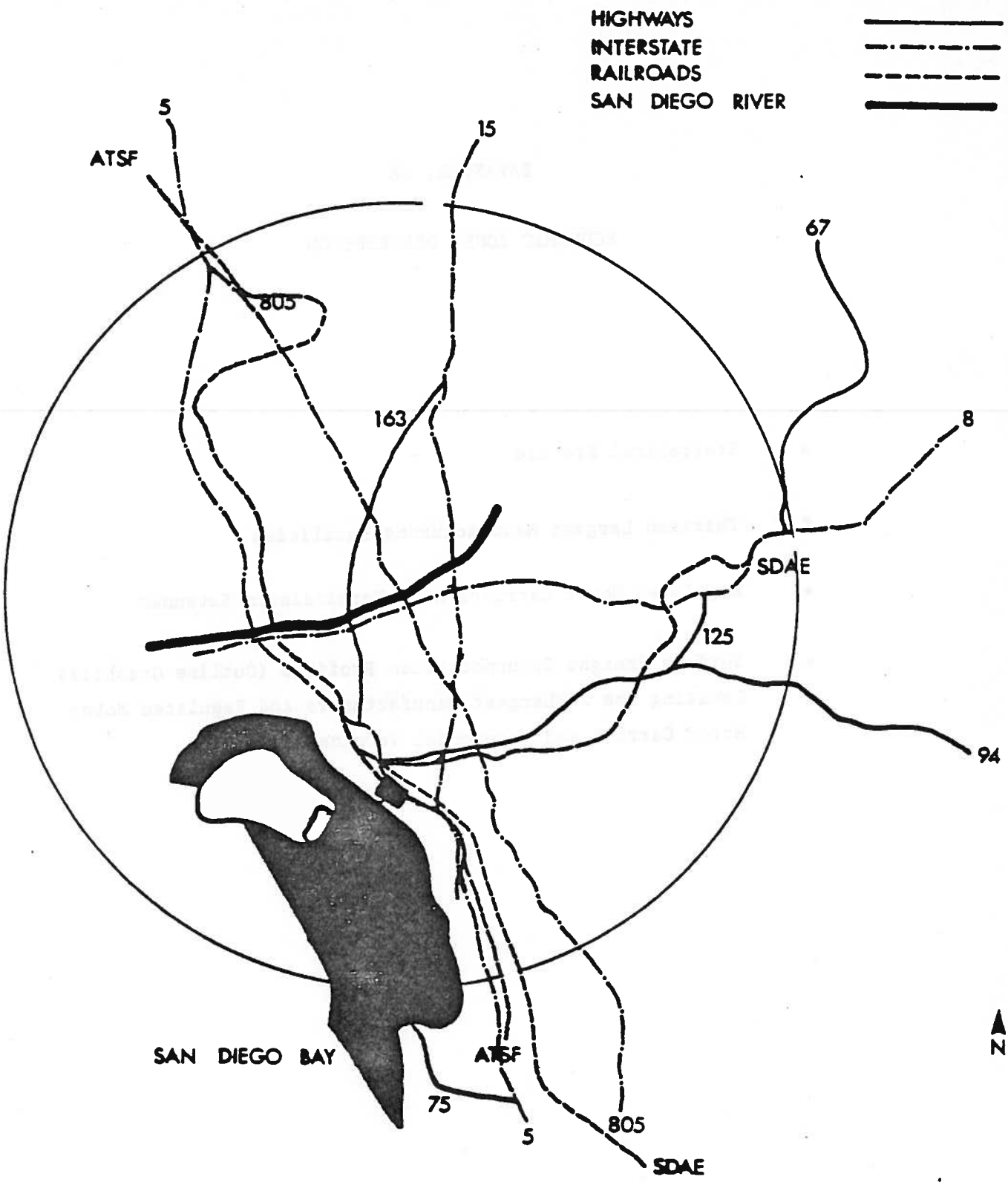


SURFACE FREIGHT TRANSPORTATION PROFILE,
SAN DIEGO, CA ECONOMIC ZONE

SCALE: 1 to 250,000

0 _____ 5

Miles



SURFACE FREIGHT TRANSPORTATION PROFILE,
SAN DIEGO, CA ECONOMIC ZONE

● INTERMODAL TERMINALS

SCALE: 1 to 250,000

0 _____ 5

Miles

SAVANNAH, GA STATISTICAL PROFILE

- Location: Southeast Georgia
- Area (approximate): 64.5 square miles
- Prinicpal Highways:[a]
  - Interstate

    Route 16 Route 95
  - U.S. Highways

    Route 17 Route 17A
    Route 80
  - State Highways

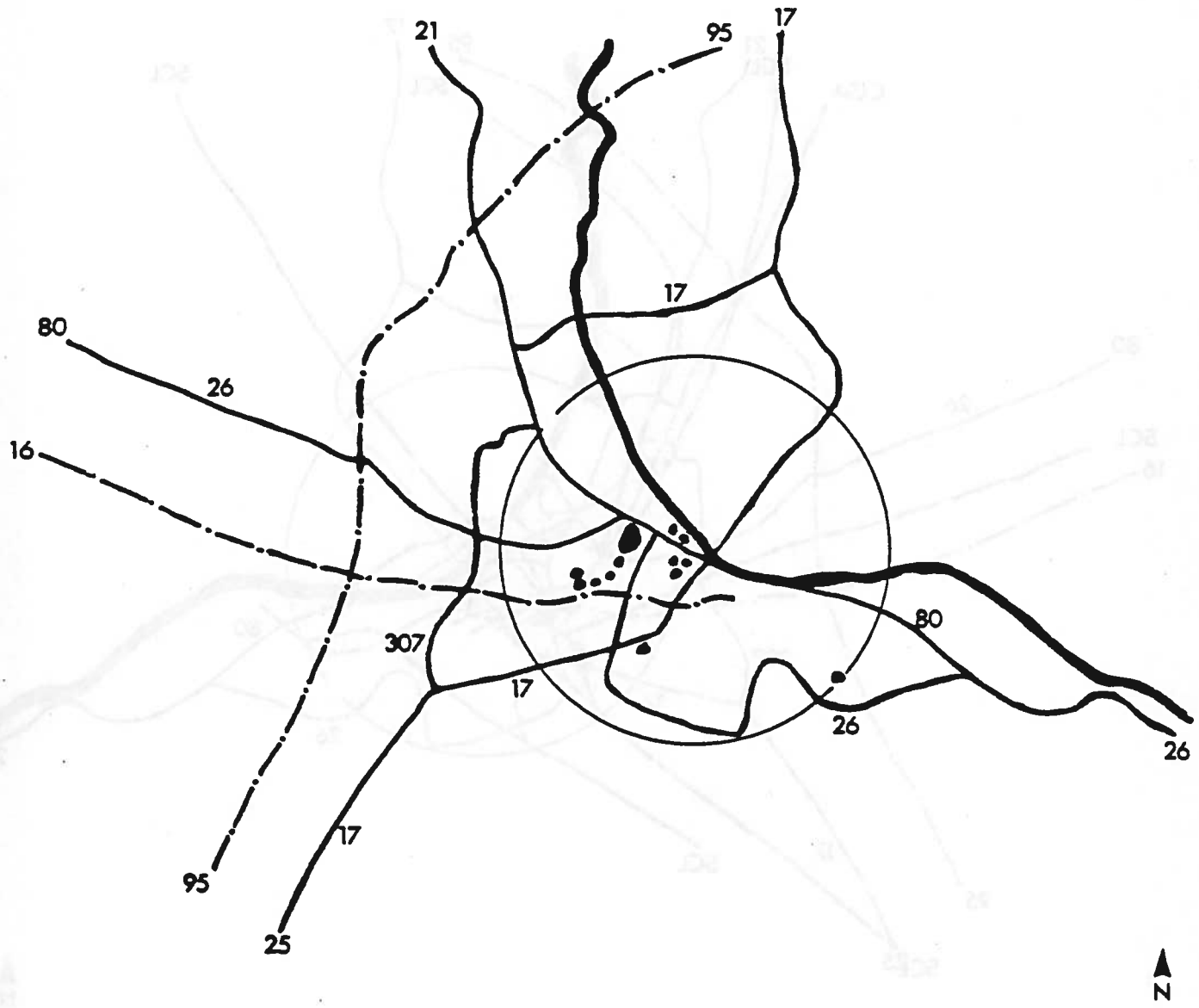
    Route 26 Route 25
    Route 21 Route 307
- Motor Carrier Terminals:[b] 28 (5 located)*
- Railroad Freight Service:[c]
  - Seaboard Coast Line
  - Southern Railway (Central of Georgia)
- TOFC Terminals:[c]
  - Seaboard Coast Line
  - Southern Railway
- Manufacturing Facilities:[a]
  - 300 - 400 employees: 1
    400 - 500 employees: 3
    500 -1000 employees: 3
    1000 or over 3

Source:
a Georgia Ports Authority
b National Highway & Airways Carriers & Routes, 1980.
c The Official Railway Guide, 1979.

*Addresses either post office boxes or route numbers.

REGULATED MOTOR CARRIERS WITH TERMINALS
IN THE SAVANNAH, GA AREA

ABF
American Freight
Bowman
Brown Transport
Carolina Freight Carriers
Central Truck Lines
Cooper Motor Lines
East Texas Motor Freight
Eastern Express
Estes Express Lines
Five Transportation
Gateway Transportation
Georgia Highway Express
Johnson Motor Lines
McLean Trucking
Mercury Motor Express
Old Dominion Freight
Overnite Transport
Pilot Freight Carriers
Roadway Express
Ryder Truck Line
Seawheels
Smith's Transfer
Southeastern Freight
Spector Freight System
Thurston Motor Lines
Watkins Motor Lines
Yellow Freight System



SURFACE FREIGHT TRANSPORTATION PROFILE,
SAVANNAH, GA ECONOMIC ZONE

SCALE: 1 to 250,000

0 _____ 5

Miles

SPOKANE, WA

ECONOMIC ZONE* DESCRIPTION

- Statistical Profile
- Twenty Largest Manufacturing Facilities
- Regulated Motor Carriers with Terminals in Spokane
- Surface Freight Transportation Profiles (Outline Graphics) Locating the 20 Largest Manufacturers and Regulated Motor Motor Carrier and Intermodal Terminals

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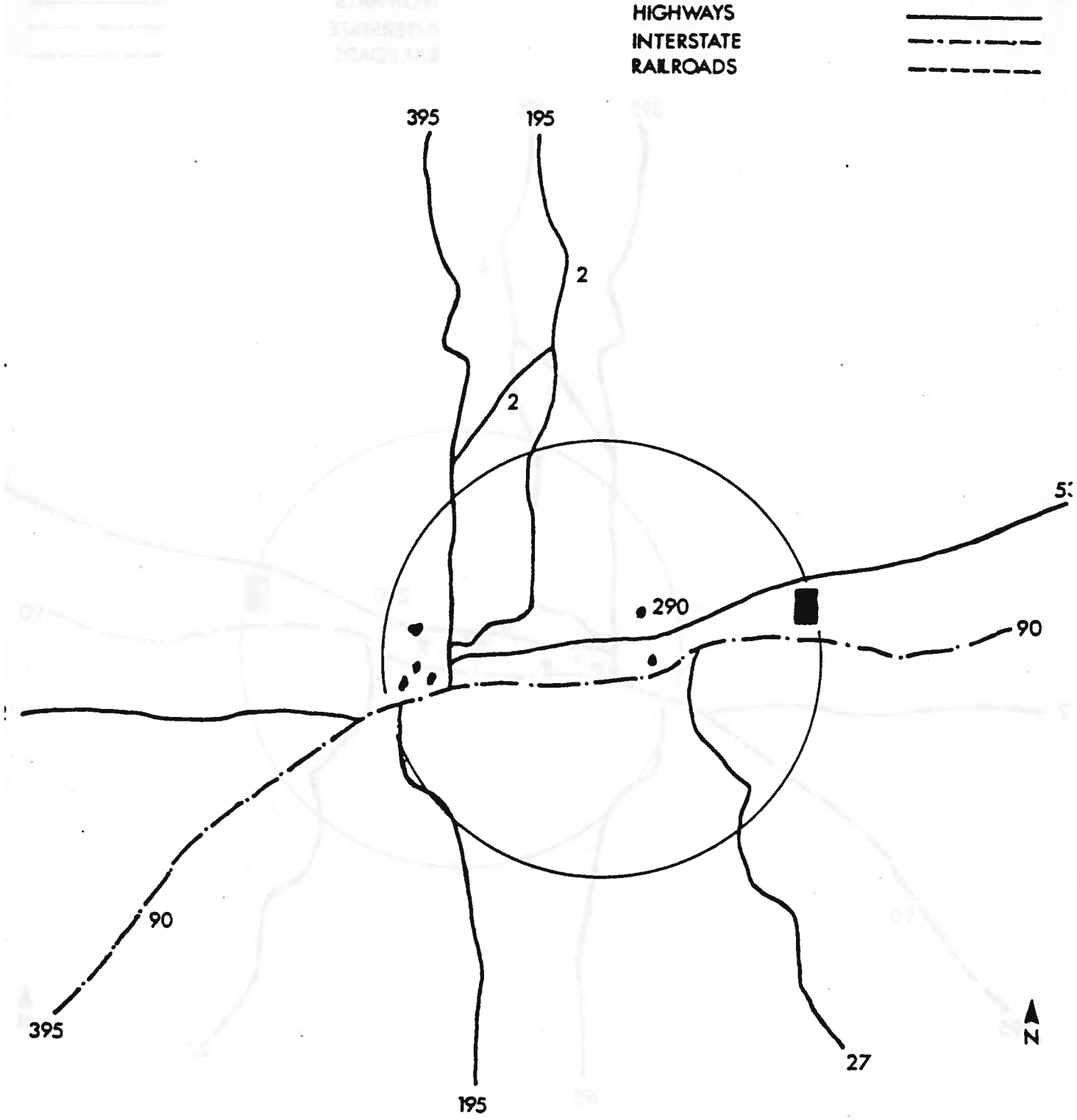
*Note: The economic zone is defined by a circle. The diameter of which connects the sites of the two outermost manufacturer facility(ies) and/or regulated motor carrier or intermodal terminal(s).

TWENTY LARGEST MANUFACTURING FACILITIES IN THE SPOKANE, WA AREA*

SIC CODE	FIRM
33	Kaiser Aluminum #1
33	Kaiser Aluminum #2
35	Key Tronics Corp.
39	American Sign & Indicator Corp.
27	Cowles Publishing Company
36	Columbia Lighting Inc.
30	Gifford Hill
37	Fiberform
37	Comet Corp.
23	Pacific Trail Sportswear
32	Central Pre-Mix Concrete Company
28	Comico American, Inc.
37	E-Z Loader Boat Trailers
35	Clark Equipment Company
20	Silver Loaf Baking Companh
23	Kathleen Louise Manufacturing Company
33	Spokane Steel Foundry Company
34	Weld Brothers Metal Products Inc.
20	ITT Continental Baking
28	Hollister-Stier Laboratories

Source: Spokane Area Development Council, August, 1978.

* Listed according to number of employees

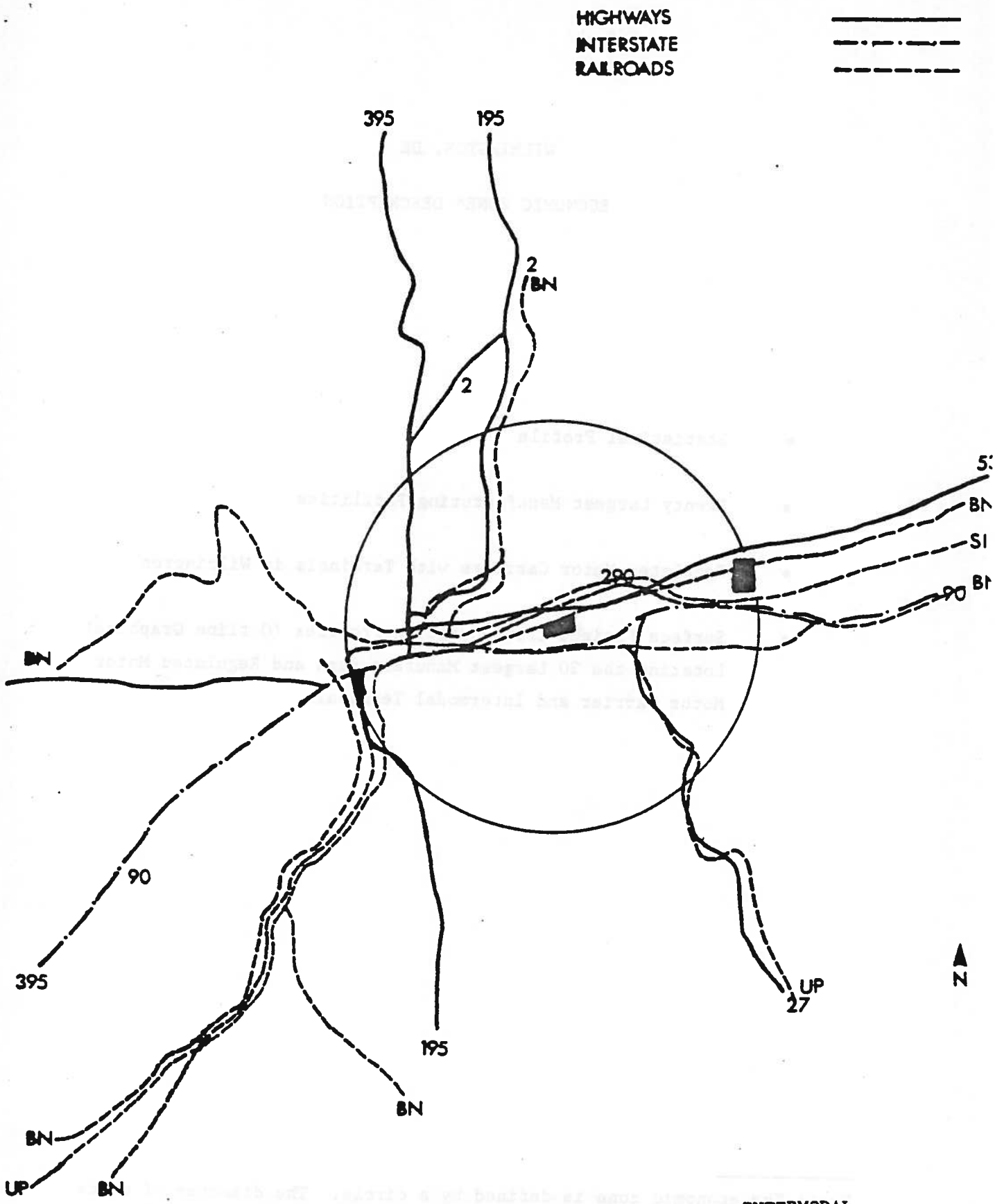


SURFACE FREIGHT TRANSPORTATION PROFILE,
SPOKANE, WA ECONOMIC ZONE

SCALE: 1 to 250,000

0 _____ 5

Miles



SURFACE FREIGHT TRANSPORTATION PROFILE,
SPOKANE, WA ECONOMIC ZONE

● INTERMODAL TERMINALS

SCALE: 1 to 250,000

0 _____ 5

Miles

WILMINGTON, DE STATISTICAL PROFILE

- Location: Northeast Delaware
- Area (approximate): 150.5 square miles
- Principal Highways:
  - Interstate

    Route 95
    Route 495
    Route 295
  - U.S. Highways

    Route 1
    Route 40
    Route 202
  - State Highways

    Route 7
    Route 41
    Route 52
- Motor Carrier Terminals:[b] 26 (19 located)*
- Railroad Freight Service:[c]
  - Chessie System (Baltimore & Ohio)
  - Conrail
- TOFC Terminals:[c]
  - None
- Manufacturing Facilities:[d]
  - 100 - 200 employees: 13
    200 - 300 employees: 4
    300 - 400 employees: 1
    500 - 1000 employees: 2
    1000 or more 5

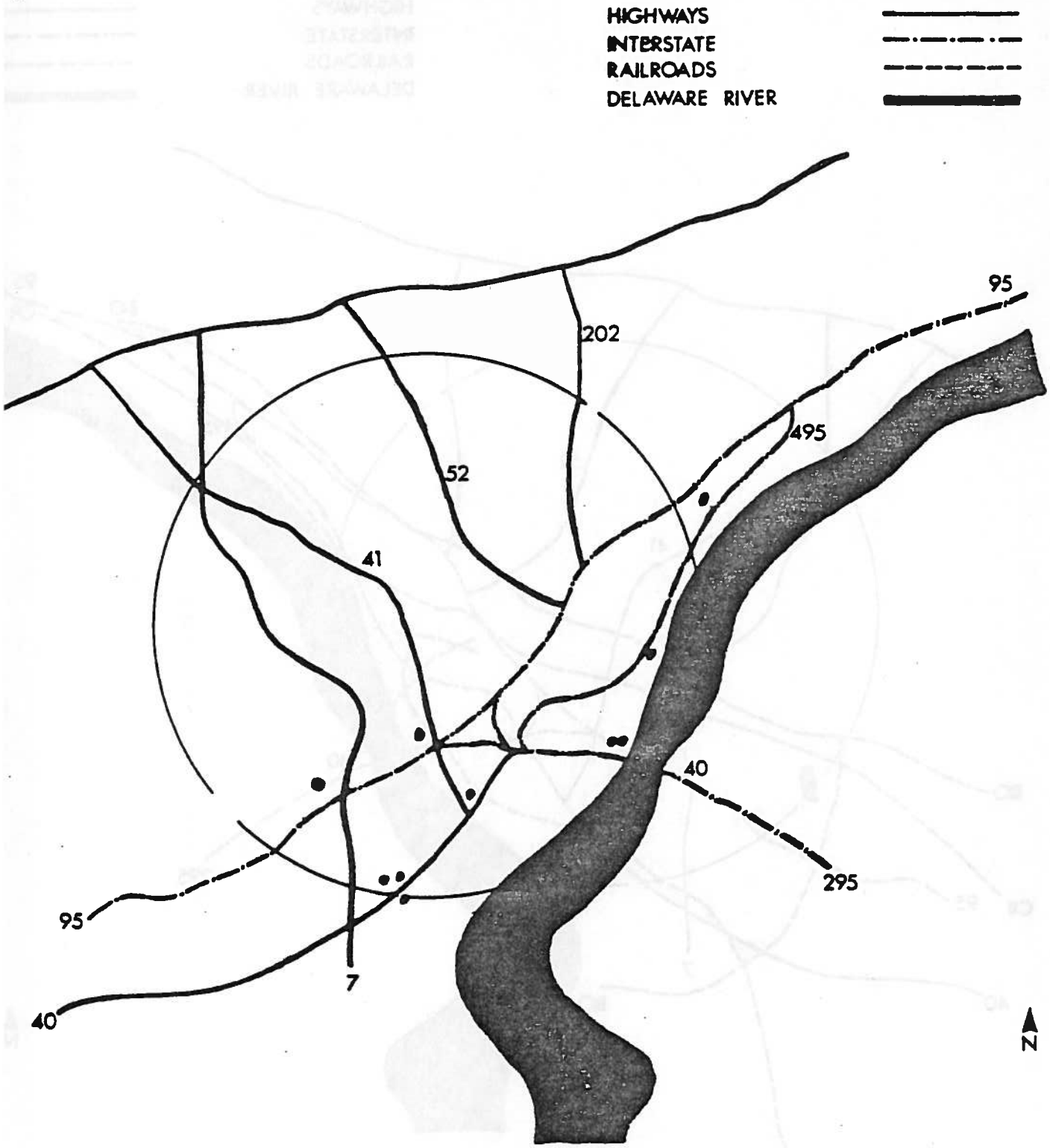
Sources:
b National Highway & Airway Carriers & Routes, 1980.
c The Official Railway Guide, 1979.
d Wilmington Chamber of Commerce.

*Addresses either post office boxes or route numbers.

REGULATED MOTOR CARRIERS WITH TERMINALS

IN THE WILMINGTON, DE AREA

Branch Motor Express
Carolina Freight Carriers
Carpenter's Motor Freight
Cooper Jarrett
Davidson Transfer
East Texas Motor Freight
Estes Express Lines
Hall's Motor Transit
Hemingway Transport
Interstate Motor Freight
Johnson Motor Lines
James Motor
Kirby & Kirby
Long's Express
Mason and Dixon Lines
McLean Trucking
Modern Transfer
Mushroom Transportation
Pacific Intermountain Express
Pilot Freight Carriers
Preston Trucking
Riss International
Tidewater Inland Express
Transcon Lines
Wooleyhan Transport
Yellow Freight System



● REGULATED MOTOR CARRIER TERMINALS

SURFACE FREIGHT TRANSPORTATION PROFILE,
WILMINGTON, DE ECONOMIC ZONE

SCALE: 1 to 250,000

0 _____ 5

Miles

APPENDIX B

REPORT OF NEW TECHNOLOGY

The work performed under this contract was an examination of the current status of technology and operating procedures for the movement of manufactured commodities and thus, by its nature, did not lead to any inventions. The examination of the current state led to the identification of areas where further research and development activities appear to be warranted.

110 Copies