New Jersey's Link to the 21st Century:
Maximizing the Impact of Infrastructure Investments

Working Paper No. 8:
Business Relocation Patterns and Trends

Ross D. Weiner, Ph.D.
Shmuel Yahalom, Ph.D.
Claire E. McKnight, Ph.D.
Herbert Levinson
Robert E. Paaswell, Ph.D.
Yamilka
Jose Holguin-Veras, Ph.D.

April 2002

Partial support for this study has been provided by the United States Department of Transportation and the New Jersey Department of Transportation. The views and opinions stated herein are the opinions of the authors.

CONTIENTS

1. INTRODUCTION

This working paper describes employment trends and patterns in New Jersey over the last decade. Its focus is on the relocation of firms and jobs, into New Jersey, and their transportation implications. It addresses questions such as the following

- How has employment in New Jersey changed over the last decade?
- To what extent has the relocation of firms with jobs into New Jersey contributed to employment growth?
- Where did "the move to New Jersey" begin, i.e., what are the origins of firms and employers that moved into the state.?"
- Where did new employment take place within New Jersey?
- What is the "industry mix" of firms that relocated, and how does this vary by county? Finance, insurance and real estate (FIRE) and pharmaceuticals are analyzed in detail.
- Why did economic activity relocate in New Jersey, and to what extent did transportation play a role?

Data-Base

The analyses and findings are based upon employment data obtained from the New Jersey Department of Commerce and Economic Growth and the New Jersey Office of Business Research.

The relocation data was provided by the New Jersey Department of Commerce and Economic Growth. This database contained the information that companies moving into New Jersey provide when registering with the State. The data represented 1017 firms that relocated into New Jersey from outside the state or the country from 1990 through 1999. Intrastate moves or firms leaving the state were not included. Additionally, neither the reason that a firm decided to relocate nor whether the move represents an opening of a branch or a complete move are not included.

The 1017 firms employed an estimated total of 108,000 employees and represented 74 industries as defined by different NAICS (North American Industrial Classification System) codes. The data set included the name of the firm, the year of registration, the destination county and address in New Jersey, the state or country of origin, the number of employees and the SIC number (to two digits), and description of the "line of business." A substantial number of firms were missing addresses, number of employees, and/or SIC codes. Missing addresses were obtained from the web or telephone books. A computer program converted SIC two digit codes to NAICS three digits codes, and the missing ones were determined from the "line of business" description. For firms missing information on number of employees, the average number of employees for firms with the same NAICS code was used.

Report Organization

The following sections of this working paper analyze the overall patterns of change, the "geography" of the move into New Jersey, the economic characteristics of the firms that relocated, and the reasons for the move. Finally, it identifies the role that transportation played in the relocation process.

2. PHYSICAL SETTING

New Jersey has experienced significant economic growth and change over the past decade. It's strategic location between New York City and Philadelphia, extensive road and rail systems, large tracks of developable land, and incentives offered by the state have contributed to the growth.

New Jersey is a densely settled state. While the state is roughly rectangular with the long axis oriented North-South, the locations of New York City to the northeast and Philadelphia about three quarters of the way down the west side of the state gives a diagonal axis to development and the main transportation corridor (which connects New Jersey to the rest of the East Coast). (See Figure 1) The northeast part of the state (facing New York City) is the most industrialized part of the state, with four old cities (Newark, Elizabeth, Jersey City, and Paterson) acting as centers of dense development. Development has spread out from this core, particularly along the transportation corridor (consisting of US 1, I-95, the New Jersey Turnpike, and the northeast passenger rail lines) connecting the northeast industrial core to Trenton (the state capital) and Philadelphia. A second, smaller and less dense area of development radiates from Philadelphia. The northwest part of the state is mountainous and has relatively little development. The southern part of the state is flat, but also largely undeveloped.

The State's transportation system includes marine ports and the Newark International Airport, both located in the northeast section of the state and both major stimulants to the New Jersey economy. Several major highways radiate from New York and the industrial core around Newark, including the New Jersey Turnpike and US 1 (mentioned above as part of the diagonal transportation corridor), the Garden State Parkway, which runs down the coast, and two Interstates (I-80 and I-78) which cross the northern part of the study area in an east-west direction. A circumferential interstate segment (I-287) circles the urbanized area around Newark and along the Hudson River about 20 miles (32.2 km) west of the river.

The northeast part of the state is served by an extensive commuter rail system radiating from Newark and Hoboken and serving New York City. Additionally Amtrak's main line (the Northeast Corridor) runs through New Jersey along the same corridor as the New Jersey Transit main line from Newark to Trenton.

Commuter service between Philadelphia and Trenton is provided by the Southeast Pennsylvania Transportation Authority, the Lindenwald Rapid Transit Line links Philadelphia with several New Jersey suburbs.

Economic activity in New Jersey is strong. One factor that makes New Jersey stand out from other states is its role within the U.S. freight network. The Commodity Flow Survey (1) indicates that 223.9 million tons were transported in New Jersey in 1997; this translates into 34.45 billion ton-miles. Trucking is the dominant mode, accounting for 84.9% of the total. For

the most part, the cargoes are transported relatively short distances (72.5% are transported less than 50 miles [80.5 km], and 81.8% of the tons are transported less than 100 miles [161 km]). The maritime port of New York and New Jersey is largely located in New Jersey; this is the largest East Coast entry point for freight from overseas; hence New Jersey is a major transshipment location, making warehousing, transportation, and similar industries major contributors to the New Jersey economy. A second characteristic of the New Jersey economy is the large number of pharmaceutical firms. While manufacturing in general grew slowly in New Jersey through the 1990s (7% over ten years), chemical manufacturing, which represents the largest category within New Jersey manufacturing, grew 36 percent.

3. OVERVIEW OF EMPLOYMENT CHANGE

Employment in New Jersey increased from 3.1 million people in 1989 to 3.3 million in 1999 – a growth of over 160,000 jobs. (Table 1). Employment in the 14 counties "Northern New Jersey Study Area, accounted for more than 75% of the state's total, both in 1989 and in 1999.

Components and Patterns of Change

The components of employment growth are summarized in Table 2. About two-thirds of the 162,000 job growth come from relocations into New Jersey, and the other third from net internal growth.

Table 3 shows the net employment change by component for each county. The largest overall growths were in Middlesex and Somerset counties, which collectively accounted for almost 50% of the growth. The major declines occurred in the "inner ring" of counties around New York City, Union, Essex, Passaic and Hudson.

Employment resulting from relocations was concentrated in Hudson, Bergen, and Middlesex counties. These counties accounted for over half of all job migrations.

Trends

The year-by-year trends in employment are shown in Figure 3. Economic conditions resulted in a decline from 1989 to about 1992. The steady increase since then resulted in an almost 15% employment growth between 1992 and 1999.

The trends in firms and jobs relocating to New Jersey are shown in Table 4. Overall, some 1017 firms and 108,015 jobs moved in the state between 1990 and 1999. On the average, 101 firms moved into the state each year with a standard deviation of 11.8.

4. RELOCATION PATTERNS

The geographic patterns of firms and jobs relocating in New Jersey provide insight into their transportation and economic implications.

Origins

The origins of firms and jobs are shown in Table 5. They reflect both proximity and size of economic activity at the point of origin.

- 897 firms eighty eight percent originated in the United States. The remaining 120 firms, (12%) came from 22 different countries from outside the United States; 57 firms came from Europe, with the United Kingdom (19 firms) the single largest foreign origin. After the United Kingdom, the top foreign origins were Canada (17), Germany (17), and Japan (16). Twenty eight firms come from Pacific Rim countries, including Japan. Not surprisingly the countries of origin are dominated by strong economies.
- Some 548 firms (54%) came from New York State, and another 99 firms, (10%) came from Pennsylvania. They reflect the dispersion of activity from the New York and Philadelphia area.
- The origins of jobs show a similar pattern. Almost 98,000 jobs, 91%, came from locations within the United States, while more than 10,000 jobs, 9% came from Canada and abroad.
- The size of the relocated firms tends to shrink slightly with distance from New Jersey. Firms moving from New York State had an average of 114 employees; from the rest of the United States, averaged 109 employees. Those from outside the country averaged 85 employees. However, the 16 firms from Japan had an average of 121 employees.
- The industries of firms by origin are shown in Table 6.
- The predominant industry of the relocating firms was manufacturing (NAICS 31 – 33), which accounted for 301 firms (29%). By type of manufacturing, the leading firms were miscellaneous (53), food manufacturing (42), chemical manufacturing, which includes pharmaceutical companies (32), and computer and electronic products (28). After manufacturing, the highly represented industries were: transportation and warehousing (206), service industries (142), retail (115), and finance, insurance, and real estate (FIRE – 102). In the service category, 57 firms (40% of the 143 firms) were in professional, scientific, and technical services, and another 25 (17%) were in administrative and support services. The pattern of industries for only those firms that originated in the United States is similar. Interestingly, all firms that moved from Connecticut and Delaware were in transportation and warehousing.
- The types of industries represented by the firms relocating from New York also show a similar pattern in that the largest category was manufacturing (176 out of the 548 firms). However, the FIRE category is second with 90 firms, transportation and warehousing follows with 56; and wholesale trade is fourth with 44 firms. Within manufacturing, the two largest categories were food (30) and miscellaneous (30); chemical manufacturing was third with 15 firms. The movement of transportation and warehousing (and also wholesale trade) from New York to New Jersey follows a long term trend. Given the high cost of land, congestion within New York City, and the more direct connections to the rest of the country from New Jersey, the large freight industry associated with the New York/New Jersey port has tended to migrate from the east side of the Hudson River to the west side.
- Firms relocating from Pennsylvania were dominated by warehousing and storage (87 of the 99 firms). For California, the third largest origin, manufacturing with seven firms, particularly computer and electronic products manufacturing (4) and professional, scientific, and technical services (5 firms) were the largest categories. (Professional services has shown high growth in New Jersey over the last decade and is expected to grow stronger in the next several years.

Companies moving from foreign countries were mainly manufacturing firms. Eight of 19 firms from the United Kingdom were in manufacturing, nine of 17 from Canada, five of 17 from

Germany, and four of 16 from Japan were in manufacturing. There is little pattern within the overall manufacturing category, except that the firms are usually in light manufacturing.

Destinations

The location of the 1017 firms that moved into New Jersey is shown in Figure 4. Figure 5, in turn, shows the number of firms that relocated to each county. Firms largely clustered in Northern New Jersey, across from New York City, and in Southern New Jersey near Philadelphia. There was also a concentration of firms along the I-95/Northeast Corridor Rail Line across the state. The Northeast part of the state with mountainous terrain had few relocations, as did the "shore counties" along the Garden State Parkway/Route 9 corridors.

Destinations of firms in New Jersey counties ranked by the number of firms are shown in Table 7. This table also shows the number of jobs and the average employment per firm. Overall, about 85% of the firms and jobs located within the 14 - county Northern New Jersey Study Area.

Over half of the firms (524 firms) relocated to just three of New Jersey's twenty-one counties: Bergen, Hudson, and Middlesex. Nine of the top ten counties were located in Northern New Jersey, with the top three counties for business relocation located directly across from New York City. Together, these nine counties accounted for 80 percent of all business relocations to the state. The tenth top county is Gloucester, located next to Philadelphia.

The locations of jobs are also graphically depicted in Figure 6. Approximately 68% of the 108,015 jobs relocated to four counties, Hudson, Bergen, and Middlesex, near New York City, and Gloucester near Philadelphia. In contrast, the three counties along Delaware Bay (Salem, Cumberland, and Cape May), the two counties along the south New Jersey shore (Ocean and Atlantic), and three counties in mountainous Western New Jersey (Sussex, Warren, and Hunterdon) accounted for less than 5% of the total relocations.

Origin Destination Linkages

The original destination patterns of firms moving into New Jersey from 1990 to 1999 are shown in Table 8. Both the origins and counties are in rank-order by number of firms. Counties that received fewer than 20 firms were grouped into two larger zones: Northwest and Southwest counties.

- The largest flow (189 firms) was from New York to Hudson County. Hudson County faces midtown and lower Manhattan (where the largest concentration of jobs are) across the Hudson River and has direct connection to Manhattan via the PATH trains (a commuter subway), the Lincoln and Hudson Tunnels (which handle cars and many express buses), and ferry service.
- The next largest flow (101 firms was from New York to Bergen County, across the Hudson from the northern part of Manhattan and connected by the George Washington Bridge. The third largest flow (90 firms) was from New York to Middlesex County; Middlesex is slightly further from New York City, but has been growing rapidly over the last several decades. The next three largest flows of firms from New York was to three counties (Essex, Union, and Passaic) in the northern industrial core of New Jersey, all counties with substantial existing economic bases.

- The largest flow from an origin other than New York were firms that relocated from Philadelphia to Gloucester County, which is immediately to the south of Philadelphia, across the Delaware River.

The major flows of jobs are shown in Table 9 for movements of 500 or more jobs. The single largest flow of jobs was the move from New York to Hudson County; about 24,000 jobs, or about 22% of the total job flow. Destinations of other major employment moves from New York State included Bergen County (12,449 jobs), Middlesex County (9,824 jobs), and Morris County (3,649 jobs).

The major moves from Pennsylvania were substantially lower. The included Gloucester County, 2,713 jobs, Mercer County, 2,311 jobs, and Burlington and Camden Counties – each with about 1,250 jobs.

The percent of Pennsylvania firms that moved to Gloucester County (26%) was the same as the percent of jobs, but the remaining Pennsylvania jobs were more concentrated than the firms, with Mercer County receiving 22 percent, and Camden and Burlington each receiving 12 percent of the jobs. Gloucester, Camden, and Burlington form the New Jersey suburban counties for Philadelphia. Georgia, Missouri, Texas, and Washington show up in Table 9 because of one or few large firms.

5. RELOCATIONS BY INDUSTRY

A further analysis was made of firms relocating to New Jersey by specific industry type. The overall mix of industries, the employment densities by activity; the trends over the decade; the location by county, and flows from New York and Pennsylvania by industry were assessed.

Overview

Overall, some eight industry groups were analyzed; manufacturing; wholesale; retail; transportation and warehousing; information, finance, insurance, and real estate (FIRE), services, and other. Table 10 gives the firms, employers, and employees per firm for each group.

- The major industries ranked by number of firms, were manufacturing, 30%, transportation and warehousing, 20%, and services, 14%. Collectively these three groups accounted for almost two thirds of the 1017 firms relocating between 1990 and 1999.
- The major employment groups were manufacturing, 28%; transportation and warehousing 18%, FIRE, 17%, and services 16%. These groups accounted for almost 80% of the 108,015 employees that relocated.
- The number of employees per firm averaged slightly over 100 per company. The largest firms were in FIRE, with an average of 170 employees per firm. The next largest were in information (e.g. broadcasting and telecommunications with 131 employees per firm, and services with 122 employees per firm. Manufacturing, which accounted for the largest number of firms and employees, averaged 100 employees per firm.

Trends by Industry Group

Table 11 shows the number of firms and jobs by industry group that moved to New Jersey between 1990 and 1999. The greatest number of firms moved at the beginning and end of the 1990's reaching a peak of 118 in 1999. The percentages of firms in the major industrial groups

were stable across the decade. Firms in manufacturing were the largest group and were so for every year in the study. Transportation and warehousing were the second largest category in all but one year. Observing these groups over time, no distinct temporal pattern within any particular group is apparent. However, when viewed as a whole, the number of firms moving to New Jersey within these groupings trends upward, especially after 1993.

The peak years for relocations of firms by industry group were

	Year	Firms/Year
• Manufacturing	1997, 1998	38
• Wholesale	1995, 1997, 1998	9
• Retail	1999	18
• Transportation and Warehousing	1998	28
• Information	1998, 1999	9
• FIRE	1999	19
• Services	1991	20

The peak years for jobs relocating were

	Year	Jobs
• Manufacturing	1998	4221
• Wholesale	1993	594
• Retail	1999	2421
• Transportation/ Warehousing	1997	2658
• Information	1997	2145
• FIRE	1991	3454
• Services	1997	3386

[Comment there is some duplication with earlier discussion – maybe this section could be eliminated and placed in the appendix]

Relocations to Counties

The relocation of firms to counties by industry group are shown in Table 12. The counties spec that accounted for most locations by industry group were as follows:

- Manufacturing 147 firms – about half of the 301 total manufacturing relocations to New Jersey moved to Bergen, Hudson, and Middlesex counties (54, 48, and 45 firms respectively.)

- Wholesaling 32 firms – about 46% of 69 total relocations – moved to Hudson and Middlesex County. (16 firms in each county.)

- Retailing 64 firms – about 56% of the 115 total relocations, moved to Bergen, Hudson, and Middlesex counties (24,21, and 19 firms respectively.)

- Transportation and Warehousing 103 firms half of the 206 total relocations, moved to Gloucester, Middlesex, Hudson and Bergen Counties. (32, 30, 22, and 19 firms respectively.)

- Information 32 firms - about 80% of the 50 total relocations moved to Hudson and Middlesex Counties. (16 and 10 firms respectively.)

- FIRE 68 firms - 63% of the 108 total relocations moved to Hudson County.

- Services 69 firms - 43% of the 143 relocations moved to Middlesex, Bergen, Hudson Counties (26, 23, and 20 firms respectively.)

Several important findings emerge from these patterns.
First, Hudson, Bergen, and Middlesex Counties dominated the relocations in most industry groups. This is largely attributed to their proximity to New York City, and the availability of extensive express highways and rail transport.
Second Gloucester County, across the Delaware River from Philadelphia with high development densities and an extensive express highway network dominate the transportation and locations.
Third the large number of FIRE firms that relocated to Hudson County reflects their proximity to the Wall Street Financial area in Lower Manhattan. The PATH trains provide an effective public transport connection; New Jersey Transit's bus and light rail lines also give this area excellent intra state public transport access.
Fourth Bergen County's concentrations of retail and service firm relocations may be due the large employment base within the county, proximity to New York, and good transportation access.
Fifth Middlesex County's large number of relocations reflects its location in the Northeast corridor, the presence of major rail lines and highways, and its proximity to Rutgers and Princeton Universities. Thirteen professional service firms (out of 20 total service relocations) moved there. Eight firms in chemical manufacturing (out of 45 total manufacturing relocations moved there. Many of these firms may be pharmaceuticals that enjoy a strong presence throughout New Jersey.

The remaining counties in New Jersey have no distinct patterns, except for the concentrations of transportation and warehousing in Gloucester County, with 32 firms, and in Mercer County, with 18 firms. The large presence of such businesses in these counties may reflect with proximity to Philadelphia and the associated rail corridor.

O-D Linkages by Industry
The industries and the destination counties of the firms moving from New York and New Jersey are shown in Table 13. The relocations from New York State and Pennsylvania were mainly to counties closest to New York City and Philadelphia respectively. They reflect the long-term trend to decentralize economic activity. For example, Hudson County had 189 firm relocations from New York, but only one from Pennsylvania; while Gloucester County had 26 from Pennsylvania, but only 4 from New York.

1) New York The largest number of the firms moving from New York were manufacturing firms (176 firms), which moved predominantly to Hudson, Bergen, and Middlesex in that

order. Five types of manufacturing account for 57% of these firms: Food (30 firms); miscellaneous (30); apparel (15); chemical (15); and computer and electronic products (11). The next largest category was finance, insurance, and real estate (FIRE – 90 firms). Thirty nine (39) of these were in security intermediation and related activities. Two thirds of these located to Hudson County. This is expected; since many of the Wall Street firms have been moving their back office operation across the river to Hudson County, New Jersey, and Hudson County has courted these firms with lower taxes and other incentives.

Firms in various service industries were the third largest group, with professional, scientific, and technical the largest subgroup with 32 firms. The service firms from New York tended to locate in a pattern similar to firms overall, with the greatest number in Hudson, Bergen, and Middlesex. Retail firms (60) were the next dominant industry with transportation and warehousing following with 56 firms; thirty three of the latter group were warehouses or storage facilities.

2) Pennsylvania Looking at the relocations from Pennsylvania, 87 of the 99 firms were in transportation and warehousing, and 21 of these relocated to Gloucester County, is the location of a major rail terminal. Many of these likely moved from Philadelphia either to be nearer the rail terminal or to find cheaper available land. Interestingly firms in the transportation and warehousing category actually moved from Pennsylvania to 17 of the 21 New Jersey counties.

6. EVALUATION OF "INDUSTRY CLUSTERS"

The New Jersey Council of Economic Advisors cites several "industry clusters" in its "New Jersey Review & Economic Outlook for 2001-2002" report. These "industry clusters" represent specialized companies of a similar nature clustered geographically. Two of these sectors are "information technology" and "pharmaceuticals." This section explores the geographic location of these clusters with respect to firms relocating to New Jersey and the transportation infrastructure.

Information Technology

Between 1990 and 1999, 40 firms of NAICS classifications 334 (Computer and Electronic Product Manufacturing), and 514 (Information and Data Processing Services) moved into New Jersey. 25% (10 firms) of the firms moved to Middlesex County, followed closely by Bergen County with 20% (8 firms), and Hudson with 17.5% (7 firms). Across all 21 counties 1.9 firms of these types on average relocated to New Jersey from 1990 to 1999. As shown in Table 14, no other counties had numbers significantly different from the average of firms relocating to the 21 New Jersey counties from 1990 to 1999.

Middlesex, Bergen, and Hudson counties led both in individual classifications as well as the total number of firms relocating. This is consistent with the relocation results across all industrial sectors.

While Hudson County was a close third to Middlesex and Bergen Counties, most firms relocating there were in information services, not electronics manufacturing. The proximity of Bergen County to the George Washington Bridge, Interstate 80, and the New Jersey Turnpike

explains the preponderance of manufacturing firms locating there. A similar explanation holds for Middlesex County, which is close to the New Jersey Turnpike, Garden State Parkway, and the Northeast rail corridor. The location of these counties with relation to transportation corridors, and the resultant ease of access, makes them very attractive to those (manufacturing) firms seeking to reach their target markets as efficiently as possible. The fact that Hudson and Middlesex Counties also exhibit high percentages of Information Services firms is largely explained by the wealth of transit (PATH, NJ Transit, Amtrak) serving these counties, making it easy for employees and customers to reach worksites from both within New Jersey and from New York City. This, combined with proximity to New York City – a large consumer of such services – helps to explain why such firms relocated to these areas.

The movement of jobs into New Jersey in this cluster closely reflects the movement of firms. The three counties leading in terms of number of firms relocating also lead in terms of numbers of new jobs. The notable exception is that while Bergen County absorbed only 20% of the new firms, it absorbed 37% of the new jobs. In contrast, Middlesex County, absorbed 25% percent of the new firms, but only 18% of the new jobs.

The number of jobs created per firm is also of interest. Firms in NAICS 334 created 118 jobs per firm, while firms in NAICS 514 created 239 jobs per firm. This suggests that while firms in information services provide more jobs, they may also rely more heavily on the ability of the transportation system to get their employees to and in from work. Most information service firms (NAICS 514) relocated to Middlesex, Hudson, and Bergen Counties with easy transportation access.

Pharmaceuticals "Pharmaceuticals" falls within the NAICS classification Chemical Manufactures (NAICS 325). Of the 32 firms of this classification moving into New Jersey, 6 were pharmaceutical (or related) companies. These firms moved into only three counties: Middlesex, Mercer, and Somerset, and were distributed evenly across these counties as shown in Table 15.

Agglomeration may explain why pharmaceutical firms relocated into these counties. That is, other pharmaceutical firms (e.g., Bristol-Meyers Squibb) already had a presence in these counties, and relocating firms wanted to be close to similar enterprises. The firms are also in proximity to Princeton and Rutgers Universities.

All firms relocated close to major transportation corridors. For example, both pharmaceuticals in Somerset County located in Somerville. Somerville is close to Interstate 278 and on the Raritan Valley line of New Jersey Transit. Similar arguments can be made for the firms relocating in Middlesex and Mercer Counties. The choice region to relocate may have as much to do with access to transportation as to proximity to other pharmaceuticals.

The smaller number of pharmaceutical firms makes judgment about the relationship between the new jobs created and firm location difficult. However, it is important to note that four of the six pharmaceutical firms located in counties that also absorbed the greatest percentages of new jobs. Both Middlesex and Mercer Counties are close to significant transportation infrastructure, interstate highways, major external roads such as US 202, and Northeast Corridor .

Proximity to the interstate highways makes moving products efficient while proximity to transit makes it easier for these firms to recruit employees from a greater number of locations,

especially given the heavy congestion on many New Jersey highways. Once again Middlesex County and its wealth of access to transportation corridors leads the field in terms of the number of firms relocating, as was also the case with Information Technologies.

Implications It is clear that access to transportation plays a large role in the relocation decisions of firms. In this case, two "clusters" of firms chose to relocate in counties that were not only near to similar firms, but also close to road, rail, or both. The reasons include efficient movement of products and ease of access for employees. As businesses continue to relocate to and expand in New Jersey, and as the state continues to encourage new business development the impacts of transportation on the location decisions (and the impact of these firms on the transportation system) must be taken into account.

7. REASONS FOR RELOCATION

Firms relocate for many reasons: proximity to markets and labor force, land costs and availability; tax advantages; and good transport access. The reasons vary by type of economic activity. Thus financial "back" offices relocate to Hudson County, largely because of their proximity to Wall Street and convenient rail access. Pharmaceuticals relocate to Middlesex, Mercer and Somerset Counties because of convenient highway access, and their proximity to other companies and major universities.

To further understand why firms relocate, salient literature was reviewed, and pilot surveys were conducted.

Some Previous Studies Several studies analyzed relocations of firms and jobs from New York City in the 1980's

Interface Study. An interface study conducted in 1984 identified industrial firms decisions to leave New York City and relocate to New Jersey (Interface Report, 1984). Key responses were as follows:

1. The single most important reason for moving was cost and availability of space 59%, crime 9%, cost of doing business 9%, inability to renew lease 9%, and miscellaneous factors, 15%. The miscellaneous factors included product transportation quality of life, union problems, and labor supply.

2. The main reasons cited for the decision to move were (1) space for expansion, 48% (2) rent increase, 31%, and 3,451 ?? product transportation and taxes, 21% each.

Additional reasons included energy cost, 19%; employee transportation, 11%; costs of doing business and inconvenience of loft buildings, 8% each. (Note: respondents gave multiple reasons.)

3. The most important reason for moving to New Jersey (rather than another state) (1) lower rents, 29%; (2) proximity to Manhattan 9%; (3) owner lives in New Jersey, 8%; (4) proximity to markets, 8%; (5) purchase price, opportunity to purchase space, 6%; (6) government assistance from New Jersey 5%; (7) lower crime rate, 3%; (8) lower taxes; 3%; (9) product transportation 3%; employee transportation was number 14 on the list, 2% (Multiple responses).

4. The various reasons cited by firms for moving to New Jersey (multiple responses) were (1) proximity to Manhattan, 68%; (2) cheaper rents; 50% (3 and 4) lower taxes and easier employee access, 32% each; (7) good product transportation, 29%; (8 and9) lower leases, and better finances for space purchase, 16% each; and (10) owner lives in New Jersey (15%)

Brooklyn Economic Development Corporation Survey. A 1985-1986 survey of 2,000 freight users produced information from 447 firms. The most important factors in making a decision to remain in Brooklyn or leave were (1) cost of renting or purchasing space, 42.6%; (2) employee access 41.5%; (3) labor costs and supply, 40.2%; (4) proximity to markets 35.1% (5 and 6) availability of space for expansion, 32.4% each; (6) crime/severity, 29.5%; and (7) proximity of owner's/manager's residence, 28.0% (multiple responses).

The rankings varied by type of firm. 296 manufacturing firms ranked employee access first; 117 wholesaling firms ranked space first and 39 transportation firms ranked taxes first.

Pilot Survey. Pilot surveys were conducted during 2001 by the research team. Results of respondents [cited number] indicated that firms relocate to New Jersey for the following reasons in order of importance: (1) proximity to their customers; (2 and 3) general transportation access and labor force availability; (4) land value or cost; (5 and 6) cost of labor and availability of space; (7 and 8) tax incentives and New Jersey personal income tax; and (9) proximity to the president's home.

The key transportation–related factor was access to major highways; followed by (2) firm's transportation cost; (3) availability of space for parking; (4) employee ability to commute directly; (5) availability of and access to public transportation; (6) road congestions; (7) new transportation infrastructure; (8) employee transportation cost; (9) access to railroad; and (10) access to port and airport.

8. TRANSPORTATION IMPLICATIONS

It is clear from both the analysis of where firms relocate, and the reasons why they do so that good transportation is an important locational factor.

A clear pattern emerges of where firms locate, relative to both transportation and proximity. Firms tend (1) to cluster in Northeast New Jersey – the densest part of the state close to Manhattan or (2) be strung out along the Northeast/Southwest corridor. A smaller proportion locate along the Garden State Parkway/Route 9 corridor that parallels the coast.

Distance from Manhattan and Philadelphia has important bearing on where firms relocated. The relative frequencies of relocations as a function of distance from New York City are shown in Figure 7. Forty percent of the firms relocated within ten miles (16.1km) of the Holland tunnel (a major entry point to the financial district of Manhattan) and 65 percent (almost two thirds) relocated within twenty miles (32.2 km). The proportions located in the next three bands are almost flat. This suggests that the desire to be close to Manhattan or the agglomeration effects of the business concentrations in Northeastern New Jersey reach about twenty miles (32.2 km) out. The upward trend at the 60 miles (96.6 km) and more reflects the concentration of firms around Philadelphia and to a small extent the scattering of firms in the southeastern counties.

The "bathtub" shape of the curve suggests the opposing economic pulls of New York City and Philadelphia; the difference in the heights of the ends of the curve indicate the relative attraction of the two cities. The New York City consolidated metropolitan statistical area (CMSA) had a 1990 population of 19.6 million and 1993 total personal income of $534 billion, compared to Philadelphia CMSA's 1990 population of 5.9 million and $138 billion in total personal income (2); the New York to Philadelphia ratio is 3.3 for population and 3.9 for total personal income.

Figure 4 shows the distance that the firms located from New Jersey Turnpike (I-95 above Trenton and I-295 below Trenton); I-95 was used to represent the diagonal transportation corridor. Sixty percent of the firms located within five miles (8.05 km) of the Turnpike. (Many of these firms are also within twenty miles (32.2 km) of the Holland Tunnel.) The distribution from the Turnpike after five miles (8.05 km) is relatively flat.

The geographic patterns in these two graphs suggest that firms new to New Jersey are congregating in the same areas as the existing firms, in the suburban areas close to New York and to a lesser extent to Philadelphia, and along the major transportation corridor. While many of the firms, particularly those moving from New York, were seeking less expensive land, the importance of access still has a major influence on their locational decisions.

The concentration of new firms in densely developed areas and along major traffic corridors places additional pressures on existing transportation facilities. The picture that emerges is that the business relocation process had had, and will continue to have a definite, although uneven impact on the state's transportation system, especially in the counties near New York City. Similarly, continued employment growth from either business expansions or relocations will call for additional transportation investments.

The continued expansion of office space to serve Wall Street will require good public linkages to Manhattan, as well as to major communities in New Jersey. Development densities are too high to rely on automobiles, and road capacity access the Hudson River is limited. Early reestablishing PATH service to lower Manhattan (as a result of September 11) is essential. A subsequent easterly extension to the heart of Manhattan's Financial District is consistent with this objective. Similarly, Northern and Southern expansion of New Jersey Transits Light Rail Line would further reinforce the transit orientation of the Hudson County Financial District.

While the increases in Hudson County Employment are closely linked to rail transit, the growing pharmaceutical industry in Middlesex, Burlington and Hudson Counties will remain highway orientation.

Just as PATH service is a major asset of Hudson County commercial/industrial development, roadway enhancements in the US 1 / I-95 corridor will be desirable as development expands in the "Northeast" corridor.

9. CONCLUSIONS

Within the last decade, New Jersey employment has increased about 5 per cent. Most of the increase reflects firms relocating from other states. Over 1,000 firms and 100,000 jobs relocated to New Jersey.

Relocation decisions in New Jersey, have been influenced by needs for more space, lower rent and transportation costs, proximity to markets and better transportation. Relocations, as elsewhere, reflect both centripetal and centrifugal ("push – pull") forces. There is the trend to disperse, seek more space at lower costs, often closer to markets. And there is the countervailing trend to locate near similar establishments, as agglomerations. Both of these forces have been experienced by industries that have relocated.

The locations where "industries" relocated include proximity to New York City and Philadelphia, opportunities for agglomerations; and good transportation access. Proximity to Manhattan (Wall Street) and available rail transit underlies expansion of financial and information activities in Hudson County. Land availability and good highway access underlies the relocation along the Northeast Corridor; proximity to Universities, established companies and good highway access underlies the concentrations of pharmaceutical establishments in Somerset, Middlesex, and Mercer Counties. Continual relocations, especially in these areas, bring a concomitant need to expand highway and public transport services.

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