

Executive Summary

The purpose of this study is to explore the commute from low-income areas in the city to the suburban areas where newly created blue-collar or entry-level jobs are located. The study has four objectives:

- (1) to identify low-income areas of Baltimore for the establishment of an unemployed labor pool of city residents that depend on public transportation;
- (2) to identify job locations in the Baltimore Region that match the education and skill levels of the identified labor pool;
- (3) to access transportation services available to identified job areas; and
- (4) to present alternative solutions to the problem of inaccessibility.

The report is presented to give a clear perspective of the problem facing Baltimore City and surrounding counties. Even though this case study of the Baltimore Region presents selective sampling, it offers a realistic picture of the problem of commuting from the city to the suburbs by those who are transit dependent. Aside from accomplishing the set objectives, this study will also make a contribution to previous studies in reverse commuting for the Baltimore Metropolitan Area.

- ▶ The Baltimore Metropolitan Area is the study area of this investigation. The metropolitan area, located in the State of Maryland, presents a unique and interesting case study for reverse commuting. The area consists of Baltimore City and five neighboring counties: Anne Arundel, Baltimore, Carroll, Harford, and Howard.
- ▶ The problem is connecting job opportunities with those individuals who are public transit dependent. The challenge is to provide public transit and other reverse commuting services economically and conveniently without sacrificing the present job accessibility of traditional commuting.
- ▶ Traditional commute patterns in the Baltimore Region consist of: (1) surrounding suburban residents traveling to Baltimore City; (2) Baltimore City and suburban residents traveling to the Washington, D.C. and Virginia areas; and (3) city residents traveling to city jobs. These traditional commuting patterns have undergone major shifts in commuting trends over the past 27 years. The traditional commute to downtown Baltimore job locations presents a centralized and easy area for transit to service. Conversely, the suburban job locations are decentralized. Suburban jobs are numerous and cover miles of area and space. Also, they are often located in areas that are difficult for transit services.
- ▶ The crux of the problem is that Baltimore City shoulders the effects of suburbanization. Neighboring counties are experiencing economic growth while the city experiences great

losses in low skilled jobs. Most inner-city businesses that offered entry-level jobs have relocated to the suburban malls and business districts. Baltimore has a high unemployment rate of 9.2% and a large population of concerned poverty.

- ▶ Employers in the suburbs find the task of getting needed employees to their job sites difficult. Conversely, privately-owned residents who live in low-income areas and depend on public transportation, find it difficult or nearly impossible to get the job opportunities that are available in the suburbs. One reason for this disparity is lack of public transportation and inadequate connections to or from the transit services that presently exist.

Low-income Areas

- ▶ In Baltimore City, 92 census tracts were classified as poverty-zoned. This study identified 14 census tracts which established a labor pool that would best benefit from a reverse commuting program.
- ▶ From three spatial analyses, the North Avenue Corridor was identified as a low-income area in Baltimore City. The North Avenue Corridor consists of:

CT 802	CT 805	CT 806	CT 908
CT 909	CT 1204	CT 1205	CT 1206
CT 1301	CT 1302	CT 1303	CT 1401
CT 1402	CT 1403		

These 14 census tracts were chosen by selective sampling from 92 census tracts. Income level, population, location, and previous studies were examined for each census tract before selection was made.

- ▶ Six test variables were analyzed. The variables are: (1) median household income; (2) poverty rates; (3) percentage of college graduates; (4) percentage of labor force; (5) percentage of unemployment; and (6) percentage of car ownership.
- ▶ The average median household income for all 14 census tracts is \$16,289. This average falls below 80% of the city's median household income. Compared to Baltimore City, the North Avenue Corridor average median household income is 68% of the city's median household income. Based on this study's definition of low-income, the North Avenue Corridor qualifies as a low-income area.
- ▶ The average unemployment rate of the North Avenue Corridor is 14%, which is about 5% above the city's 9.2% unemployment rate.

- ▶ In the North Avenue Corridor, 82% of the labor force has a twelfth-grade or lower education level, thereby disqualifying those members of the labor force from jobs which require a college degree or special training beyond twelfth-grade. The labor force in this corridor needs to be matched with suitable jobs that require a twelfth-grade or lower education level and little to no work experience. Jobs which require low skills have been called entry-level or blue-collar jobs.
- ▶ Car ownership for the area is averaged at 42%, or approximately 13,171 car owners. About 58%, or 18,189 persons without a car are denied accessibility to job opportunities.
- ▶ About 2,914 residents in this corridor will benefit from a reverse commuting program. These residents are in need of both employment and public or private transportation to the job.
- ▶ From the analysis, the North Avenue Corridor met all six criteria for an area in Baltimore City with a residential labor pool of low-income, unemployed individuals.
- ▶ The total population of the North Avenue Corridor falls around 55,132. Of this population, approximately 31,360, or 57%, is in the labor force. Places of employment have not been determined for the nearly 26,317 residents presently working; therefore, their need for reverse commuting services is not addressed in this study.

Job Locations

- ▶ In the month of July 1997, the Baltimore Region had 169 job listings that required little or no work experience. In August of 1997, the Region showed an increase of 145 job listings requiring little or no work experience. Out of the 314 total job listings, Baltimore City had 58 job listings, of which only 27 required a twelfth-grade or lower education. The remaining 31 required a college degree or special training.
- ▶ More than half the job openings in Baltimore City require a college degree or special training. Baltimore City changed its economic base from manufacturing to tourism in 1976, promoting the city as a regional center for banking, finance, tourism, and international trade, thereby expanding its professional service sector. By 1990, Baltimore had an increase in service jobs, highly skilled professional jobs, and white collar jobs.
- ▶ Baltimore County has the highest number of job openings in the region which require a college degree and/or special training. Baltimore County had 336 job openings on July 14, 1997. Of these 336 jobs, 220 required a twelfth-grade or lower education level, with or without work experience. The locations were in the Reisterstown-Owings Mills, Cockeysville, Pikesville, Security, Hunt Valley, and White Marsh areas. The Towson area was omitted in this study due to the fact that most of its job listings were jobs that required specialized skills, training, or college degrees.

- ▶ Carroll County has the largest number of job openings in the region that require twelfth-grade or lower education levels with little to no work experience. Carroll County had 36 job openings on July 1, 1997. Of these 36 jobs, 303 jobs were blue-collar jobs. The job locations were in Westminster, which is a 40-minute commute from Baltimore City by car and more than 90 minutes by bus.
- ▶ Harford County had 245 job openings, with 190 of them being blue-collar jobs. These jobs were located in the Belair-Fallston, Aberdeen-Havre De Grace, and Edgewood-Joppa areas.
- ▶ In the Baltimore Region, Howard County and Anne Arundel County were selected for transportation studies. Both counties have job opportunities that are suitable for Baltimore low-income residents in the North Avenue Corridor.

Howard County

- ▶ Howard County is situated in an exceptional geographic location, this location being a 20 to 30 minute commute from Baltimore City. The county's diverse business base ranges from high technology, telecommunications, and biotechnology companies to research and development firms, wholesale distributors, and manufacturers. The largest annual average employment industries are: services, 29,388; retail trade, 19,032; wholesale trade, 8,517; and local government, 8,019. Howard County has more than 6,091 businesses that employ about 83,706 workers. An estimated 141 businesses have 100 or more employees.
- ▶ Jobs in Howard County grew, from 59,200 in 1980 to 104,000 in 1990, an increase of 76%.
- ▶ At 3.4%, Howard County has the lowest unemployment rate in the Baltimore Region.
- ▶ Howard County has the highest educated work force in the region, with 91.1% of its population having a high school or higher level of education. Of the population, 46.9% has a Bachelor's Degree or higher. The occupational characteristics of this labor force are the following: (1) 52.6% of the labor force work in executive, administrative, managerial, professional specialty, and technical-related support jobs; (2) about 26.6% work in sales and administrative support jobs, including clerical positions; and (3) the remaining 11.7% work in manufacturing, trade, and distribution jobs.
- ▶ Approximately 31% of the labor force in Howard County commutes to jobs in the Baltimore Region while some 34% commute to Washington, D.C. About 33% of Howard County residents commute within its jurisdiction to work. This leaves opportunities for

Baltimore City residents to work in the blue-collar jobs that are not occupied by Howard County residents.

- ▶ The U.S. Route 1 Corridor/Columbia Gateway Area Employee/Employer survey conducted by the Baltimore Metropolitan Council showed that only 24% of employees working in the area lived in Baltimore City. A reverse commuting program could increase the percentage of city residents' employment and link unemployed city residents to Howard County jobs.
- ▶ Current jobs listings according to Maryland's Automatic Labor Exchange Search System Database for July 7, 1997, revealed 77 possible blue-collar job openings that required a twelfth-grade or lower education level and little to no work experience. On July 1, 1997, the number of available blue-collar job openings increased to nine. Table 4 gives the job listings in the Baltimore Region obtained by the Maryland's Automatic Labor Exchange Search System Database.
- ▶ Along U.S. Route 1, from the starting point of I-195 to Jessup I-175 and along the I-172 Columbia Gateway area, 58 "Help Wanted," "Now Hiring," and "Accepting Applications" postings were counted. Postings were observed at gas stations, fast food restaurants, retail stores, and along the road.
- ▶ The Sun Paper had an average of 71 listings for the Howard County area.

Anne Arundel County

- ▶ Anne Arundel County is in the corridor between Washington, D.C. and Baltimore City. Annapolis, the State Capital and a historic district, is a major tourist attraction for the state and county. Annapolis has the most available unskilled employment opportunities in the Region.
- ▶ Anne Arundel County's economy is grounded in high-technology, communications, distribution, and computerized support services. Growing industries include environment-related technology, regional data centers, and life sciences. The Baltimore/Washington International Airport (B.W.I.) located in the Northwest section of the county has a growing base of international and domestic carriers. The B.W.I. area is a hub of commercial and industrial development, supporting about 50% of all jobs and 57% of all companies in the county. Anne Arundel's 11,053 businesses employ more than 138,221 workers. An estimated 203 of these businesses have 100 or more workers.
- ▶ The unemployment rate for Anne Arundel County is 4.1%.

- ▶ The educational levels of Anne Arundel County residents are as follows: (1) 81.1% of the population has a high school education or better; (2) 24.6% have a Bachelor's Degree or higher; and (3) 18.9% have less than a high school education.
- ▶ The percentage of residents who commuted to work outside Anne Arundel County in 1995 was approximately 38.7%. Of the labor force, 61% presently works in Anne Arundel County. Although a large percentage of residents work in the county, the large number of job openings is more than enough to share with Baltimore residents.
- ▶ For the Region, Anne Arundel County had the largest number of jobs that required little or no work experience available. From the data in the job database on July 14, 1997, 67 jobs were available in the county for those who had little to no work experience. Table 5 shows 136 out of 165 positions requiring a twelfth-grade education, with or without work experience.
- ▶ In the field study, 63 "Help Wanted" signs were counted along Veterans Highway and Ritchie Highway. The Sun Paper had an average of 75 job openings located in Anne Arundel County.

Current Transportation Systems

- ▶ Bus route 13 travels along North Avenue at an average of 15- to 20-minute intervals and has a 7-day operation schedule. There are four number 13 bus routes: (1) runs from Walbrook Jct., Garrison and Bloomingdale to Canton around Boston and Toone; (2) runs to Fells Point near Lakewood and O'Donnell; (3) an express line runs to Towson; and (4) an express line runs to Hopkins/Providence Road.
- ▶ Bus route 91 travels via Garrison Blvd. and provides service to Rogers Avenue Metro Station, Pimlico Race Course, Walbrook, Coppin State College, State Office Center, the Baltimore Arena, and Charles Center Metro Station. The route runs along North Avenue between Bloomingdale and a block up from Eutaw Place.
- ▶ Light Rail service links Timonium and Cromwell Station/Glen Burnie via downtown Baltimore. A Hunt Valley extension is planned to open by the end of September 1997. Future extension plans are being considered for the Penn Station and B.W.I. Airport. There are 23 light rail stops. The trains run about every 15 minutes and operate seven days a week. Monday through Friday, the light rail operates from 5:00 a.m. to 11:00 p.m., on Saturday from 8:00 a.m. to 11:00 p.m., and on Sundays from 11:00 a.m. to 7:00 p.m. The fare is about \$1.35 per one-way trip. From the light rail stop, transfer connections can be made with bus routes.

- ▶ North Avenue corridor residents would have to ride the light rail to Patapsco Light Rail Station to connect with Route 17 bus line to B.W.I. airport area, and Route 1 bus line to Annapolis.
- ▶ The following rails are available in the city; CSX Transportation, Conrail, and the Canton Railroad (not commonly used for commuting), and the Amtrak and MARC Commuter Rail. The MARC Commuter Rail can be accessed at MARC Penn Station on Charles Street, four blocks down from North Avenue. The 13 bus route on North Avenue is within walking distance to the station. The MARC Commuter Rail operates Monday through Friday only. The three rail lines, light rail, MARC and Metro lines are depicted in Figure 17, which shows the accessibility residents have in the Baltimore Region, utilizing present rail systems.

Origin-Destination

From the North Avenue Corridor, residents commuting by public transit to the identified employment centers would most likely travel the following commuting routes:

TO ROUTE 1

- ▶ From Hopkins Place, (the State Office Center located in downtown Baltimore), the Route 320 has scheduled express buses traveling from downtown at 6:13 a.m., 7:13 a.m., and 7:50 a.m. For the return trip to Baltimore in the evenings, the P.M. scheduled express lines leave at 4:23 p.m. and 5:00 p.m. This service operates Monday through Friday. There are no services to South West Park-n-Ride in the morning. However, two express buses leave the South West Park-n-Ride en route to Baltimore at 7:14 a.m. and 8:04 a.m. Two express lines return to the South West Park-n-Ride in the evenings at 4:56 p.m. and 5:31 p.m.

Assessment: This service lacks accessibility to jobs on or around U.S. Route 1 for evening employment (2:00 p.m. to 10:00 p.m. and 3:00 p.m. to 11:00 p.m. shifts) and weekend employment. Of the employees in this area, 75% work six or seven days in a typical week. Although the bus route makes stops along U.S. Route 1, most of the businesses are located anywhere from a quarter to two miles from the main road. A trip from the North Avenue Corridor would take one to two transfers and more than one hour in travel time.

TO COLUMBIA

- ! From Dolphin and Howard Street two bus routes are available, the 310 at 8:00 a.m., 4:37 p.m. and 5:07 p.m. and the 311 at 8:40 a.m., 4:32 p.m., 5:02 p.m. and 5:56 p.m. The services from Columbia to Baltimore in the evenings are the 310 at 3:45 p.m. and the 311 at 4:05 p.m. The service operates Monday through Friday.

Assessment: The availability and quality of reverse commuting public transit services are

in no way comparable to traditional commute services. There are more scheduled express buses to Baltimore than from Baltimore. The time frame for service from Baltimore to Columbia does not allow a person to

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commute. The MARC trains stops at Dorsey, Jessup, Savage, and Laurel Race Track. A shuttle bus is available. The waiting time for the shuttle and the extended commute would add another 15 to 30 minutes to the commute from Baltimore to Columbia. Without a connecting ride, getting to the work site by walking is unsafe and time consuming.

TO B.W.I.

- ▶ North Avenue Corridor residents have the option of taking the MARC train to B.W.I. or the light rail to Patapsco and transferring to the number 17 bus line. At the MARC train station, shuttle buses are available to transport residents around the B.W.I. area. However, the 17 bus travels along Friendship Park, B.W.I., and Aviation Blvd., the main locations of where many employers are situated. The 17 bus line operates Monday through Saturday from 5:58 a.m. to 10:15 p.m. in half-hour and hour intervals.

Assessment: The commute on the bus could take anywhere from 45 minutes to two hours. In most cases, walking to the work site is required and may take another five to 10 minutes in addition to the commute.

TO ANNAPOLIS

- ▶ Residents must take the light rail at North Avenue near Park Avenue to Patapsco Light Rail Stop and there take the bus numbered 14 to Annapolis at Patapsco Light Rail Stop. The 14 bus line operates as a regular bus route Monday through Saturday from 5:30 a.m. to 10:40 p.m. in one hour intervals. On Sundays, they run on hour-and-a-half intervals.

Assessment: The total commute from North Avenue Corridor using transit would take any where from one to two hours. In a vehicle the trip would take 30 minutes.

In summary, the transit routes that are presently available only provide service during rush hour and day shift hours. The routes do not provide service during the evening hours or on Sunday.

The present transit service for commuting from Baltimore City to suburban jobs is too time consuming and inadequate to meet the needs of both employers and employees by presenting hardship and limiting job opportunities. The services are not user-friendly and, at present, discourage many from seeking employment in the counties although MTA provides commuter services, commuter services lacks door-to-door service to job sites.

County Services

- ▶ Howard Area Transit Service (HATS) is a general public transportation service owned and sponsored by Howard County, Maryland. It provides convenient, frequent bus service to downtown Columbia, the various village centers, Ellicott City's historic district, the county government office complex, Western Howard County, and the Columbia Gateway office complex. Seven routes are provided.
- ▶ Free shuttle buses are provided at the Metro Stations for transporting commuters to job sites.
- ▶ The Howard County Office of Commuter Assistance has a wealth of information on public transportation opportunities for the county and the surrounding areas. Popular modes of transportation are ride-sharing or public transportation, car-pools, van-pools, buses, shuttles, MARC or Metro.
- ▶ Anne Arundel County is serviced by the MTA. The MTA offers various bus routes and light rail service throughout Anne Arundel County. Light rail lines connect Anne Arundel County with Baltimore City and County. A new international pier with a light rail terminal will be in full operation at B.W.I. by 1997. Like Howard County, Anne Arundel County has a ride-sharing program and database of car-pools and van-pools available for commuters. Interstate Highways U.S. 50/301 (I-595), I-97, I-95, I-695 and the Baltimore/Washington Parkway Rt. 295 are accessible to Anne Arundel County.

Alternatives

- ▶ **ALTERNATIVE 1-Utilization of Park-n-Ride Stations**
A decrease in the number of commuter cars traveling to Baltimore City occurred with the creation of Park-n-Ride stations. These stations located in the suburbs were established to make commuting to the city more inviting and convenient to travelers. It provided the opportunity for commuters to park their cars at the station and therefore, ride on an express bus to the city. This decreased congestion and limited city parking problems.
- ▶ Presently, Park-n-Ride stations are only utilized Monday through Friday between 7:00 a.m. and 6:00 p.m. In the morning, only buses leave the stations with express routes to

the city. An alternative proposed for reverse commuting is that morning express buses be routed from downtown Baltimore to Park-n-Ride stations, thereby transporting city residents to the suburbs. Present morning bus service scheduled from the station to the city will continue. For reverse commuting in the evenings, express buses will be routed from the station into Baltimore City. Present evening scheduled bus service from the city to the station will continue. Once city residents are at the station, they will be picked up by contracted car-pools, van-pools, or ride-sharing programs which will provide door-to-door service to job sites.

- ▶ **ALTERNATIVE 2-Self Empowerment**
City residents will be encouraged to establish their own transportation businesses. Grants and loans will be given by State and Federal Governments. Residents may purchase a van or bus for the purpose of transporting city residents to and from job sites, providing 24-hour service. Contracts would be obtained by employers, the Department of Social Services, or individual riders. Low-cost cars could be offered to city residents for a reverse commute. These cars could be donated, managed by a non-profit organization and distributed to needy city residents. This could be done on lease or rent-to-own conditions. Local community groups could also establish reverse commuting programs.

- ▶ **ALTERNATIVE 3- Network System**
This alternative poses a web for information exchange and linkage for a common cause, reverse commuting. It consists of many players and subdivisions of federal, state, and local government agencies. A transportation network between counties and public and private organizations will improve the accessibility, availability, and quality of service.

Conclusion

The challenge of reverse commuting for Baltimore City does not lie solely in the hands of the Mass Transit Administration (MTA), and local private transit services such as Howard Area Transit Service (HATS). The challenge is posed to state and local governments, the Department of Social Services, the Department of Employment, private employers, economic developers, and planners. What is needed is a partnership consisting of the whole Baltimore Region. The problem of centralized poverty and unemployment was not created alone and hence cannot be solved alone by Baltimore. Baltimore City's problem is a regional problem which affects the whole State of Maryland.

Needed in the Baltimore Region are basic origin-destination studies to pinpoint where privately-owned residents work or could work and how they can best be serviced. Reverse commuting does not occur only in single-occupant vehicles and buses. Other modes used to meet reverse commute needs, include rail shuttle vans, van-pools, motorbike, car-pool, and ride-sharing programs. To eliminate the disparity between city residents and suburban jobs, reversed commuting programs should be established to provide door-to-door service or provide

transportation from the nearest bus or rail line to the job site and back. Programs that provide reverse commuting services could be done in partnership or individually by employers, employees, the local community around the job site, the local community at the residence of the workers, or by government agencies. Such endeavors need to be supported by federal, state, and local governments.

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INTRODUCTION

This study, "Reverse Commuting: Connecting Inner-City Labor Force to Suburban Jobs in the Baltimore Metropolitan Area," was conducted as part of the 1997 Summer Research Fellowship, sponsored by the National Transportation Center at Morgan State University. The following report provides an overview of the research efforts of graduate fellows Barbara Brown, Mohamed Al-Ward, and Hellon Ogallo under the guidance of Dr. Anthony A. Saka, Associate Professor, Center for Transportation Studies.

Reverse commuting is a term used to define work-related trips wherein privately-owned residents travel to suburban jobs. This type of commuting pattern differs from that of traditional commuting patterns which involve: (1) commute from suburb to city; (2) commute within the city; (3) commute to megametropolis; i.e., residents in one metropolitan region traveling to a larger metropolis. The pattern of commuting is determined by three factors: (1) the residency of workers; (2) the location of employment; and (3) the disparity between them. As a result of suburbanization, commuting characteristics in metropolitan regions across the nation have changed significantly. Within the past 40 years, changes have occurred in both the residency of the labor force and the location of employment. Reverse commuting reflects changes in commuting trends that are contrary to that of traditional commuting in the following ways: (1) increase in cities to suburbs and suburbs to suburbs travels; and (2) changes in the mode of travel

that increase the use of public and private transit services. As new jobs are created and city jobs relocate in the suburbs, the city to suburb pattern of travel will continue to increase in the foreseeable future. This study will focus on city to suburb travel patterns for the Baltimore Metropolitan Area.

The Baltimore Metropolitan Areas as shown in Figure 1 is the study area of this investigation. The metropolitan area, located in the State of Maryland, presents a unique and interesting case study for reverse commuting. The area consists of Baltimore City and five neighboring counties: Anne Arundel, Baltimore, Carroll, Harford, and Howard. Henceforth, the Baltimore Metropolitan Area will be referred to as the Baltimore Region.

Traditional commute patterns in the Baltimore Region have consisted of: (1) surrounding suburban residents traveling to Baltimore City; (2) Baltimore City and suburban residents traveling to Washington, D.C. and Virginia areas; and (3) city residents traveling to city jobs. These traditional commute patterns have undergone major shifts over the past 27 years. From 1970 to 1990, there was an 8% decrease in the number of workers living in Baltimore City commuting to jobs within the city boundaries (i.e., city within city commute). In Anne Arundel County, there was an 8% decrease in the number of workers who lived in the county that commuted within the Baltimore Region. During that same time period, Anne Arundel County experienced a 10% decrease in the number of workers who lived in the county that traveled in a suburb to suburb commuting pattern. Baltimore County, however, experienced very little in the distribution of trip destinations of the county commuters between 1970 and 1990. Compared to

the Baltimore Region, Baltimore County had the largest share of commuters, represented at 47% traveling outside their jurisdiction but inside the region. Only 4% of Baltimore County workers commute to jobs outside of the region. For example, Carroll County had a 16% decrease in the number of workers who commute within its county and an increase of 14% of commuters traveling to areas outside the county but within the region. Harford County experienced a 15% decrease in the number of resident workers who commute inside the county. As a final notation, Howard County had a 13% decrease of workers who live in the county and who commuted to other areas in the region (Harrold, 1996).

BACKGROUND

Baltimore City, the largest urban city in the Baltimore Region, is the central focus point in this study. The City is geographically confined within its jurisdictional boundaries, stagnated in growth potential, and surrounded by five economically growing counties (Rusk, 1995). Like most urban cities in the nation, Baltimore City shoulders the effects of suburbanization.

Baltimore suffers from a high unemployment rate and decreased job base due to lack of investment in the inner-city. Matching the unemployed inner-city labor force with the suburban jobs (Waldrop, 1994) is a growing concern for many economic planners. Recent studies and publications address the issue of suburbanization in relation to Baltimore City. One publication, "Baltimore Unbound," describes Baltimore City as both an "inelastic city"--isolated with a high concentration of Black poverty and a "declining city"--past the point of no return. The book employs the author's concepts in an enlightened study of Baltimore's continuing economic

stagnation. The book offers a frank assessment of the causes and possible solutions of Baltimore's decline. David Rusk, the author, proposed a "fair share" housing development program making housing available throughout the Baltimore Region to residents of the city who wish to relocate (Rusk, 1995). This publication presents an alternative approach to reverse commuting, overcoming the organizational barriers in jurisdiction boundaries, addressing the segregation issues and barriers to opportunity. However, the need and accessibility of public as well as private commuting transportation services for low-income individuals still pose an area of concern. This study will not explore the relocation of Baltimore residents to job locations, but will explore transportation linkage that would close the inaccessible disparity between inner-city residents and suburban jobs.

The problem of matching unemployed inner-city labor force with suburban job opportunities poses a challenge to city transportation planners, suburban employers, and government agencies throughout the Baltimore Region. The problem is not connecting job opportunities with individuals that have a car or access to a car, but connecting job opportunities with those individuals that are public transit dependent. The challenge is to economically and conveniently provide public transit and other reverse commuting services without sacrificing the present job accessibility of traditional commuting (American Public Transit Association, 1993). The traditional commute to downtown job locations presents a centralized and easy transit to service. However, suburban job locations are decentralized. Suburban jobs are numerous and cover miles of area and space. They are often located in areas where transit service is difficult or non-existent. Employers in the suburbs find it difficult to get needed workers to their jobs sites.

On the other hand, privately-owned residents who live in low-income areas and depend on public transportation find it difficult, or nearly impossible, to get to the job opportunities that are available in the suburbs. One reason for this disparity is lack of public transportation and inadequate connections to or from transit services that presently exist.

At present, approximately 70% of individuals using public transit as a mode of transportation in the Baltimore Region live in Baltimore City. According to the 1990 Baltimore census, 38.3% or about 106,032 members of Baltimore City's population did not own a vehicle. In comparison, to Baltimore Region 16.5% of the population that did not own a vehicle, the rate for Baltimore City was 21.8% higher. Also, Baltimore City's persons per vehicle ratio of 1 to 16 in 1990 was the highest in the region. The City experienced a significant change in statistical data for car ownership from 1970 when its person per vehicle ratio was 1 to 34. Most likely, the reason for this change in persons per vehicle ratio is the population decline of Baltimore City, with a loss of 171,300 between 1970 and 1990 (Woods and Poole, 1995) Vehicle ownership has mostly been a phenomenon of the middle class. The car was used as a means of commuting and was usually operated as a single vehicle traveling to and from work. As an illustration, Figure 8 shows pictures of two sites in the Baltimore Washington International (B.W.I.) Airport area. The full parking lots show that job opportunities are available to those who have a car and that most of the commuting to work is executed by way of privately-owned vehicles.

Considering vehicle usage as a mode of transportation in reverse commuting, another issue to examine besides the availability of privately-owned vehicles in the city is the vehicle's cost of

insurance. Car insurance rates in Baltimore City are almost double the rates of suburb car insurance premiums. According to an Allstate Insurance Company quote, full coverage insurance on a 1988 Ford Minivan would cost \$61.34 per month for a Howard County resident and \$125.50 per month for a Baltimore City resident for the same policy and coverage. By taking an average of a broad range of expenses, an average car maintenance cost was established. This average car maintenance cost for a city resident is \$525.00 per month which includes liability insurance of \$175.00, a monthly fuel cost (gas) of \$100.00, and an average monthly car payment of \$250.00. This estimate of maintenance cost does not include repairs, oil changes, or tune-ups for the vehicle. Consider the following hypothetical situation: If a city resident worked a 40-hour job at \$6.50 per hourly wage, his monthly income would be \$1,040.00 before taxes. The average car maintenance cost of operating a car at \$525.00 per month would be more than half the resident's salary. This expense would not be affordable for such a resident living in the city and whose educational level and skills limit him to entry-level or blue-collar jobs. The reality of it all is that most low-income city resident cannot afford to own and maintain a vehicle that is the essential means of transportation to some job locations. This phenomenon places Baltimore City residents without cars in a disadvantaged situation, secluded from job opportunities that are located in the suburbs.

HISTORY OF THE PROBLEM

Baltimore City was once the historic and traditional urban center of Maryland. The city was founded in 1729 and grew from 60 acres to 80.2 square miles by 1918. During the Revolutionary War, it became a major commercial center. Baltimore City expanded to Maryland's largest urban

center during the following decades after the war. Baltimore's diversity in transportation modes and transportation accessibility attracted many manufacturing, retail, and wholesale businesses. Known as a blue-collar city, most of Baltimore's population either worked in manufacturing or was financially dependent on those in blue-collar jobs. During that time period, most of the jobs in the region were located in the city. Commuting services, express bus lines, light rail services, Park-n-Ride Stations, and Interstates 83, 95, 295, 695, and 395 were created to transport suburban residents to the city for work. City workers living in the rural county areas of Baltimore commuted to the city daily, creating the suburb to city pattern of commuting that traditionally governed transportation efforts. What was once an effective transportation network system for suburb to city commutes has now posed a challenge to planners trying to provide accessible transportation to the new job locations that have created suburb to suburb or city to suburb commute patterns.

Between 1970 and 1985, the city lost around 12,000 transportation, communication, and utility jobs, about 17,000 wholesale and retail jobs, and approximately 47,000 manufacturing jobs (Fee and Et., 1991). The recession of 1973 through 1975 brought a massive wave of plant closures and de-industrialization to the Baltimore Region. Foreign competition from Japan, Western Europe, and a host of newly industrializing countries motivated U. S. manufacturing plants to relocate overseas in the hopes of attaining cheaper labor and reduced operation cost. As a result of the loss in blue-collar jobs, Baltimore City changed its economic base from manufacturing to tourism in 1976. The city was promoted as a regional center for banking and finance, tourism, and international trade, thereby expanding its professional service sector. By 1990, Baltimore had

an increase in service jobs, highly skilled professional jobs, and white collar jobs. Baltimore ranked tenth in the nation in 1995 for jobs in biotechnology, chemicals, and pharmaceuticals (Ey, 1995). At present, Baltimore City leads in finance, insurance, real estate, and service jobs. The crux of the problem is that many of Baltimore's inner-city businesses that offered entry-level jobs have relocated to the suburban malls and business districts. Job growth for industries that would most likely employ welfare recipients or long-term unemployed individuals are practically nonexistent in Baltimore City (Sullivan, 1996). In the 1970s, Baltimore City, like other urban cities in the nation, began to experience the effects of suburbanization.

Over the past 40 years, Baltimore's total population has decreased as the result of middle class flight to surrounding suburbs. Baltimore City ranked first in population among all 24 counties in Maryland in both 1970 and 1980 with 906,170 and 785,240, respectively. In 1990, Baltimore's population rank dropped to second with a population of 734,860. In 1997, the city's population ranked fourth in Maryland at 694,760, which averages out to a -0.72% growth in population since 1970 (Woods and Poole, 1996). Contrary to the decrease in population, the population percentage of Blacks living in Baltimore has increased. The percentage of Blacks living in Baltimore has ranked first among all 24 counties of Maryland: 46.55% for 1970, 54.89% for 1980, and 59.36% for 1990. Baltimore City has the largest concentration area of Blacks in the State of Maryland (Rusk, 1995). In addition, Baltimore also has the highest concentration of poverty, with about 45% of its population classified as "poor." In 1995, approximately 38,200 cases of families living in Baltimore City on AFDC (Assistance to Families with Dependent Children) were reported by the Department of Social Services.

Finally, Baltimore has the highest rate of unemployment in the State of Maryland. Presently, the unemployment rate for Baltimore City stands at about 9.4% and ranks last among all 24 counties in the state. Baltimore City had the largest number of workers in 1970, with about 42% of all workers living in the Baltimore Region. By 1990, the share of workers living in the city dropped to just more than 25%. Although many factors play a role in the unemployment status of Baltimore inner-city residents, one major component is the inaccessibility to suburban jobs.

OBJECTIVE AND OVERVIEW

The purpose of this study is to explore the commute from low-income areas in the city to suburb areas where newly created blue-collar or entry-level jobs are located. The study has four objectives:

- (1) to identify low-income areas of Baltimore for the establishment of an unemployed labor pool of city residents who depend on public transportation;
- (2) to identify job locations in the Baltimore Region that match the education and skill levels of the identified labor pool;
- (3) to access transportation services available to identified job areas; and
- (4) to present alternative solutions to the problem of inaccessibility.

The report is presented to give a clear perspective of the problem facing Baltimore City and surrounding counties. Even though this case study of the Baltimore Region presents selective sampling, it offers a realistic picture of the problem of commuting from the city to the suburbs by those who are transit dependent. Aside from accomplishing the set objectives, this study will also

make a contribution to previous studies in reverse commuting researched for the Baltimore Region.

LITERATURE REVIEW

The literature review focuses on the Baltimore Region. It examines the need for reverse commuting efforts, available transportation services and programs, and possible alternatives for matching unemployed inner-city labor who depend on public transportation for the commute to suburban jobs.

PREVIOUS STUDIES

A review of previous research studies was conducted to assess the need for further study of the regional area in lieu of the recent interest in reverse commuting.

A 1990 study conducted by the Center of Transportation Studies at Morgan State University examined the transportation factors constraining low-wage labor from commuting to suburban job opportunities. The study found that of more than 500 low-wage, unemployed city residents interviewed, approximately 70% did not own an automobile, although most of those residents perceived the automobile as a necessary mode of transportation for the reverse commute to the suburbs. Individual automobile ownership was predominantly a phenomenon of the suburban middle class. This study examined the available transportation services to five identified activity centers: Columbia Mall, B. W. I. Airport, Hunt Valley, Towson, and White Marsh. The study found that (1) transit travel times and costs in Baltimore severely constrained commuting to the suburban jobs by low wage-earners; (2) suburban activity centers were inaccessible from most of Baltimore City; and (3) the availability, quality, and speed of reverse commute public transit

services were in no way comparable to traditional commute services. The study concluded that there was a substantial demand for various public transit services and recommended an increase in the amount of low-income housing in suburban areas as well as the improvement of public transit's quality and speed (Farkas et al, 1990). Seven years after Farkas' research, the constraints and substantial demand for various public transportation services still exist. Since 1990, the problem of inaccessibility has magnified, due to the increasing economic growth in the Baltimore Region and the expanding disparity between employment and the unemployed city residential labor force (Ey and Mukherjee, 1996). The creation of new job opportunities in the suburbs has brought about a change in the type of employment available to city residents as well as the location of activity centers (Kline, 1996). For example, the Towson area has been eliminated in this study due to the job requirements of available job openings. Present employment listings indicate that the jobs available in this area require a college degree, job experience, or special training in finance, computer programming, or high technology, thereby offering unsuitable job opportunities for the identified labor pool of privately-owned residents.

Funded by the Abell Foundation in 1995, a more recent study titled "'Help Wanted"--Moving Forward with Reverse Commuting," explored the concept of reverse commuting, or the process by which urban residents are linked to suburban jobs. The report described programs in other communities and examined the potential for establishing a reverse commuting program in Baltimore (Abell, 1995). The issues of employment mismatch, education level of city residents, and suitable low skilled or entry-level jobs discussed in this study introduced another variable to reverse commuting (Ey, 1995). The type of job suitable to the educational and training of

Baltimore low-income residents must be matched and located (Whiteman, 1996). The factors affecting employment for Americans, especially Black Americans, are changing drastically as a new century approaches. The changes in demography, education requirements, and the impact of technology are important factors to consider in job accessibility (Hayes, 1996).

In March 1996, the Baltimore Metropolitan Council conducted an employee and employer commuting trends survey that covered the U. S. Route 1 Corridor/Columbia Gateway Area. The survey was completed by 1,189 employees representing 24 work sites and 18 employers. The report was limited by the information available in the responses to the survey questions.

However, the report displayed the results of the data collected, thus giving a credible indication of commuting trends in the area. The results showed that 85.6% of the employees commute from all parts of the Baltimore Region and that only 24.8% of the employees made a commute from Baltimore City. This survey gives an insight on the present commuting trends and the need for commuting services. Of the employees responding to the survey, 94% had a vehicle available for the commute to work. Employees without a vehicle made the trip to and from work as follows: 11 car-pooled, 15 used transit, six walked or biked, and the remaining 15 had other arrangements.

The purpose of this report was to display the survey results for information sharing only. The information was valuable in the assessment of commuting problems. For our study, concerns are geared toward individuals that do not have a vehicle available to them and to encourage the use of public transportation and commuting services as a mode of transportation to work.

In January 1997, the latest reverse commuting study of the Baltimore Region had been the Empowerment Zone Transportation Study. The study focused on issues facing Baltimore City's low-income neighborhoods in the West and East Empowerment Zones. In the study, the authors strove to develop transportation plans to provide access for residents of the East Baltimore Empowerment Zone to Anne Arundel County, Howard County, and the Fairfield Industrial Area in South Baltimore (Empower Baltimore Management Corp., 1997). Despite job-creation efforts of the Urban Empowerment Zone Project (Mathews, 1997) (Pierce, 1997), many inner-city residents cannot find suitable work (Blond, 1996) or stable employment (Camper, 1997) in Baltimore City and thus need to be directed to the suburbs where the jobs are now located.

In comparison, a similar work done in Washington, D.C. was examined, "The New Metropolitan Reality: Where the Rubber Meets the Road in Antipoverty Policy." This report published by the Public Finance and Housing Center of the Urban Institute, considered the relationship between metropolitan change and inner-city poverty. The report, completed in 1992, summarized the then-recent evidence regarding the extensive suburbanization of employment during the last two decades. The evidence provided in the report suggested that there was a virtual necessity for the suburbs to meet the employment needs of the nation's urban cities (Hughes, Stenberg, 1992).

All studies reviewed were helpful in the development and guidance of this research. As a result, this study will not repeat the previous studies, but will aim to contribute to the research with current information and added recommendations.

CURRENT COMMUTING

Literature reviews of recent articles found in the Sun Paper and Baltimore Business Journal, were conducted. Current information on new highway construction (Sun, September 5, 1996), newly created job opportunities (Kline, 1996), and new public or commuting transportation services or programs (Sun, October 22, 1995) (Sun, November 19, 1995) (Sun, February 17, 1997) (Sun, February 21, 1997) were reviewed. From the literature, it is apparent that more emphasis is given to the problem of congestion during rush hours, and the commute of suburb to city and suburb to suburb than that of improving public transportation for city residents to commute to the suburbs and within the region.

Reports from the Baltimore Metropolitan Council were examined for information on commuting and travel trends in the Baltimore Region (Steiss and Tabugbo, 1993) (Harrold, 1996). A synthesis of transit practices was examined (Transportation Research Board, 1995). Commuting information from Howard County and Anne Arundel County was reviewed to determine what public transportation was available, what private commuting transportation was available, and what transfer of services was available once an inner-city commuter reached the end of the original city departure line and entered into that given county. The data from these reports concluded that transportation to meet the needs of city residents was unattainable.

To develop an understanding of the transportation network available, information about partnerships, employers' involvement and ride-share services was reviewed. The information was examined for accessibility, availability, and effective quality of service.

LOW-INCOME CITY RESIDENTS

Reports on empowerment zones by the Empower Baltimore Management Corporation gave statistical data of the living conditions of Empowerment Zone residents. Data from the U. S. Bureau of the Census, U.S.A. Counties 1996 CD-Rom, was reviewed for the general profile of each local government in the Baltimore Region. Along with this information, data from the Office of Labor Market Analysis and Information (Data, 1997), was also examined for current employment trends.

CONCLUSION

The literature review for this research has provided background, supportive data, and information about the increasing disparity between employment and Baltimore City's low-income residents. The research demonstrates the necessity for reverse commuting programs in the Baltimore Region. Reverse commuting--city to suburb and suburb to suburb traveling routes--is an alternative solution to the decentralization of a growing economy. What was not evident in the literature review was a network system or partnership in combining commuting efforts with government agencies, private businesses, and transportation services. Conventional mass transit can by no means solve the problem of inaccessibility to job opportunities that low-income, public transit-dependent commuters experience.

METHODOLOGY

This study was initially conducted through a literature review that provided the background information needed to support the reverse commuting issues as they related to the Baltimore Region. General public information, report studies, and statistical data of the region were obtained by way of telephone request, personal contacts, or visitation to several institutions and agencies. Background information and primary data was obtained through a literature review of reverse commuting programs and previously conducted, related research studies. The review explored the increasing employment disparity between suburban areas and Baltimore City's low-income residents. Using the ProQuest system, the Internet, Transportation Research Information system (TRIS), Wilson Social Science Abstract, and other relevant databases, literature was found on urban city decline, reverse commuting programs, and transportation planning. Some of these findings were discussed in the previous chapter. Secondary data was used to document the changes in commuting trends, economic growth, unemployment rates, types of jobs available, labor force availability, education levels, population, and job relocation throughout the Baltimore Region. Simple arithmetic operations such as averaging, percentage, subtraction, and addition were used to make comparisons in order to clarify the statistical data.

Sources of primary and secondary data included use of information found in: Soper Library at Morgan State University, the Howard County Public Library in Elkridge Maryland, the Maryland Room at the Enoch Pratt Free Library, the Baltimore Metropolitan Council, the Baltimore City Planning Commission, Empower Baltimore Management Corporation, the Maryland Department

of Business and Economic Development, the State of Maryland, the Department of Labor-Licensing Regulations (DLLR), The Abell Foundation, the Cooperative Forecasting Group, the Regional Planning District of Baltimore, the Office of Commuter Assistance, Howard County, Woods and Poole Economics, Inc., and the Internet.

INNER-CITY LABOR FORCE "POOL"

For the residential study area, the inner-city labor force "pool," is defined as a pool of unemployed residents of selected poverty areas in Baltimore City that have not been previously identified reverse commuting studies. This definition was designed by the research team for the purpose of contributing to other studies and efforts on reverse commuting conducted for the Baltimore Region. The methodology for identifying the study area, or pool, is explained in detail in the following sections:

- ▶ **Spatial Analysis for Redefining the Study Area (Pool) in Baltimore:**

Two variables, population and median income levels, were mapped in order to redefine and locate the study area or "pool" for the reverse commuting study. This mapping was designed in a fashion that would permit study and analysis of the spatial distribution of these two variables at the Census Tract's level.

Mapping- Using MapInfo 4 software, the income levels in Baltimore City were mapped to determine the spatial distribution of poverty in the city. The 1990 Census Tracts were used to map the data. The first map identifying low-income areas in Baltimore City was constructed by

using the established criteria. The criteria for the identification of a low-income area for this study are "an area located within the city having a median household income of \$19,200 or less, or no more than 80% of Baltimore City's \$24,045 median income." As a visual indicator, varying shades of blue were selected to reflect the hierarchy of income levels for each tract, with dark blue indicating the highest income levels and the dotted blue indicating the lowest (see Figure 2). The next step for identifying the residential study area was to repeat the spatial distribution and create a second map focusing on the dotted blue areas indicated from the initial map. In this step, we defined poverty areas as those with a median household income of \$9600 or less, or no more than 50% of the city's median income. By using this definition to map income levels, we were then able to isolate another spatial distribution of poverty. Again as a visual indicator, the dark blue was selected to indicate the highest income levels while the dotted blue was used to indicate the lowest (see Figure 3). In addition, Baltimore City's population was mapped by the 1990 census tract data using equal ranges of populations around the city (see Figure 4). This was done to observe the population distribution to the city. Spatial analysis was again used to determine which areas of the city had the highest and lowest representations of poverty levels. Again, color shades were selected to reflect the hierarchy of population numbers for each tract in the city. For this map, pink was used as an indicator. Dark pink indicated the largest population, while the dotted pink reflected the smallest.

In comparison, Figure 13 was created using GIS applications. To identify locations inhabited by low-income residents, the income range for the region of study's inhabitants was divided into two classes. The first class, indicated by the color blue, had a median income ranging from \$10,000 to

\$19,999. Households with income above \$19,999 were grouped into the second class, and indicated by the color orange.

Selection-From this spatial analysis, a "pool" area was selected. Areas that were colored for income levels and demonstrated a concentrated population of low-income were selected for further study. These areas were compared with areas studied in previous reverse commuting studies in the Baltimore Region. In order to minimize redundancy, those areas discussed in other studies were eliminated from this study.

! Collecting Data on Individual Census Tracts in the Labor Pool

After determining the labor pool area, data from the 1990 Census was collected on each census tract within that area. In addition, data was collected for both Baltimore City and the Baltimore Region, allowing for comparison of the selected area to the city and the Region. In this research, seven variables were selected to help determine whether or not the area should be considered for reverse commuting. The seven variables used to qualify the labor pool were:

1. Income
2. Poverty Rate
3. Education Attainment (college)
4. Total Population
5. Labor Force

6. Unemployment Rates
7. Car Ownership Rate

! Data Processing and Analysis:

The collected data for each census tract in the selected area was then organized and tabulated on an Excel spreadsheet. A chart depicting three relevant variables in each census tract was created (see Table 2).

The three variables used were:

1. Below Poverty Rate
2. Unemployment Rate
3. Car Ownership Rate

The average for all the census tracts comprising the study area was also calculated. An Excel chart (see Figure 7) depicting the three aforementioned variables for Baltimore City and the Region was again created. The intention was to compare the study area to both the city and the Region through findings determined by analysis.

JOB OPPORTUNITIES

Data was collected from the Automated Labor Exchange Search System, a job database of the State of Maryland, Department of Labor, Licensing and Regulation, and the Columbia Maryland Office. The system listed reported job openings throughout the State of Maryland. Several selected job listings were reviewed on the following dates: June 30, July 7, and July 14 of 1997, to determine if the information provided in the database was updated weekly.

From the list of jobs in each of the five aforementioned counties, four identification subdivision groups were established: (1) jobs requiring beyond a twelfth-grade education, Associate Art Degree, or more; (2) jobs requiring a twelfth-grade education or less and work experience; (3) jobs requiring a twelfth-grade education or less without work experience; and (4) jobs requiring a twelfth-grade education or less with special qualifications, skills, or licenses. A physical count was taken of each occurrence of the subdivisions and grouped accordingly. This count was taken twice to assure accuracy. For each subdivision group, the location of the jobs and repeated occurrences of location was recorded and counted.

In addition, a four-week review of The Baltimore Sunday Sun's Employment Section was examined to identify entry-level jobs that required a twelfth-grade education or less with little or no work experience. The job openings identified were counted for quantity and job location. As another factor of job availability in the Region, a review and analysis of the Planning Department's Total Employment for the Baltimore Region, 1995-2020 statistical data was examined. The 1995 yearly total employment numbers reported for each regional job activity center was subtracted from the projected 2005 and 2020 yearly total employment numbers. A percentage of change was calculated from the differences found. Job activity centers identified as job locations for this study were selected from those centers that had 6% or more increase in the percentage of change. The number of jobs available in 2020 had to show a high positive economic growth in numbers as well as in percentages.

As a step further, a field study was done by driving along (1) Route 1 Corridor, (2) B. W. I. Industrial Park, (3) Ritchie Highway, (4) Veterans Highway, (5) Columbia Mall and other Columbia Industrial and Business Parks. Signs such as "Help Wanted," "Now Hiring," and "Accepting Applications" were counted in each area to verify the availability of employment and to get additional information on job availability that was not reported to the state employment agency.

All information gathered was examined and evaluated for the determination of job location selection.

The criteria for the selection of the county or counties as possible activity areas are:

1. The county selected for study, residential labor force percentage of those that work in the county must be lower or less than 60% of the total labor force. This population of residents must not meet the employment needs for its available job opportunities.
2. The county must show economic growth over the past five years and potential for future economic growth.
3. The unemployment rate of the county must be below 5%.
4. The county must have a large number (30% or more total available jobs) of entry-level job opportunities that require little to no work experience.

An individual job activity center identified in the selected counties was determined by the following criteria:

1. The area must have 15 or more businesses located in a central place that offers low skill and entry-level jobs.
2. The area must have current job openings for entry-level jobs.
3. The area must have potential economic growth.

! Geographical Information Systems (GIS)

The results of the study are presented as maps and tables using Geographic Information Systems (GIS) which allows analysis and visualization of information. The maps and tables reveal hidden relationships, patterns, and trends. The locations of employment activity centers as shown in Table 6 were marked on the map of the region of study to produce Figure 12. Figure 23, a list of the new firms starting businesses in the area, was obtained from the Department of Assessment and Taxation. The list of the new firms mapped reflected the trend of current employment. The firms were located by their addresses and the locations were marked onto the map of the study region. The two maps, Figure 12 and Figure 23, were specifically used to verify the validity of the locations listed in Table 6. It should be noted that the figures used to produce Figure 12 are total employment numbers, including high-income jobs. Also, the number of jobs available at each of the new corporations was not considered in the pin mapping. Given that information, the two maps are not the best means to verify the validity of the activity centers' location as given in Table 6. However, the maps do give a reliable indication of job locations in the areas identified in Table 6.

TRANSPORTATION SERVICES

Information from public transportation, Mass Transportation Administration (MTA), local private transportation companies, and commuting services were obtained to access the availability of transportation in the Baltimore Region. Routes and schedules were reviewed for accessibility, availability, and effective quality of service. They were also examined to determine the degree of service provided. Information obtained was mapped and overlaid onto the central map of job activity center locations and low-income areas by use of GIS Applications (Figure 12). The bus lines, all regular MTA routes, and commuter express routes were then added to the central map to show connectivity (see Figure 18). Finally, Figure 17 was produced by adding the rail lines to the central map instead of the bus lines. Commuting constraints were studied to determine the degree of inaccessibility city residents of the defined poverty area had in commuting to the identified job activity centers in the suburbs.

RESEARCH FINDINGS

LOW-INCOME AREA--LABOR POOL

Baltimore City has a total of 203 census tracts. Of this total, 57 have 20 to 40% poverty levels, 30 have 40 to 60% poverty levels, and five have 60 to 100% poverty levels (Rusk, 1995). Of the 92 census tracts classified as poverty-zoned, this study identified 14 tracts for the purpose of establishing a labor pool that would best benefit from a reverse commuting program.

! Selection

As a result of the first spatial analysis performed, census tracts with a median income of \$19,600 or less were identified. Figure 2, a map of the low-income census tracts, reveals that most of the census tracts that fall within the 80% or less range of the median income of Baltimore City are, with a few exceptions, centrally located in the privately-owned core. The census tracts form a large cluster that covers most of the city's older neighborhoods. The area covers the West, East, and some southern parts of the city. The second spatial analysis, depicted in Figure 3, shows census tracts that fall in the \$12,500 or less range of the median income level of Baltimore City. On further analysis, it is determined that this map resembles the Empowerment Zone map of West and East Baltimore. The final spatial analysis explored the population distribution of Baltimore City, demonstrated in Figure 4. Census tracts having a population of more than 2,000 and identified as low-income were considered for the residential labor force pool selection. From the three spatial analyses, we identified an area of low-income residents in Baltimore City around North Avenue that herein will be called North Avenue Corridor. Contributing to Reverse

Commuting Studies done in the past, we selected 14 census tracts not previously chosen by the Empowerment Study:

CT 802	CT 805	CT 806	CT 908
CT 909	CT 1204	CT 1205	CT 1206
CT 1301	CT 1302	CT 1303	CT 1401
CT 1402	CT 1403		

These 14 census tracts were chosen by selectively sampling from 92 census tracts in the same method as some census tracts were eliminated. Income level, population, location, and previous studies were examined for each census tract before selection was made. Figure 5, a census tract map of Baltimore City, shows the location of the tracts selected for this study as they relate to the city's demographics and other low-income census tracts. For more detail, Table 1 defines the actual locations of the census tracts by listing them by street boundaries. Henceforth, these 14 census tracts that make up the study area will be considered the North Avenue Corridor.

! Data Analysis

The criteria used to determine whether or not the selected census tracts satisfied the objective and purpose of the study were:

- (1) The census tracts must have a low median household income level below 80% of the City's median household income.
- (2) The census tracts must have a poverty rate between 20 and 50%.
- (3) The census tracts must have a large populated area of at least 2,000 residents.

(4) The census tracts must have a high unemployment rate which makes the area ripe for empowerment development.

(5) The census tracts must have residents that depend on public transportation as a means of traveling to work.

Six test variables were analyzed. The variables were: (1) median household income; (2) poverty rate; (3) percentage of college graduates; (4) percentage of labor force; (5) percentage of unemployment; and (6) percentage of car ownership. Data from the test variables are displayed in Table 2 for each of the census tracts selected. The 1990 average median household income for all 14 census tracts is \$16,289. This average falls below 80% of the city 1990 median household income. By definition of low-income area, this median household income qualifies North Avenue Corridor as low-income. Compared to the city, the North Avenue Corridor's average median household income is 68% of the city's median household income. Noticeably, in census tracts 908 and 805 1990, median household incomes are more than \$19,600 but less than \$24,045. The average of the two census tracts falls at about 89% of Baltimore City's median household income. Although census tracts 908 and 805 have the highest median household incomes of the 14 census tracts, they also have very high unemployment rates--making them areas in need of employment development and reverse commuting programs. Census tract 805 have an unemployment rate of 18%. As shown in Table 2, the average unemployment rate of the North Avenue Corridor test variables is 14%, or about 5% above the city's 9.2% unemployment rate. Census tract 805, which has the largest median household income of \$21,667, also has the highest percentage of college graduates. The percentage of college graduates in this census tract is 53%, giving a reliable indication that there is a significant relationship between education attainment and income.

Looking at the North Avenue Corridor, 82% of its labor force has a twelfth-grade education or less. This factor alone disqualifies this labor pool from jobs that require a college degree or special training beyond twelfth-grade. The labor forces in this pool need suitable jobs that require little to no experience as well as a twelfth-grade level of education or less. These types of jobs are called entry-level or blue-collar jobs. Car ownership for the area is averaged at 42%, or about 13,171 residents. This percentage of the labor force represents the total city residents in the pool that have accessibility to job opportunities in the suburbs. About 58%, or about 18,189 residents in the North Avenue Corridor are denied accessibility to job opportunities because they do not own a car. In Table 3, the total population of 55, 132 in the North Avenue Corridor is broken down and reflects: (1) the population in the labor force, (2) the population not in the labor force, (3) the population that has a car, (4) the population that does not have a car, (5) the population of unemployed, and (6) the population of unemployed without a car. The number of people to benefit from a reverse commuting program in this corridor is 2,914. They are in need of both a job and public or private transportation to the job. From the analysis, the North Avenue Corridor met all six criteria for a credible selection of the residential labor pool of low-income areas of Baltimore City.

Of the North Avenue Corridor population, 57% is in the labor force. Places of employment for this labor force have not been determined; therefore, their need for reverse commuting service is not addressed in this study. However, for reverse commuting assessment needs, the total population of the residents unemployed were considered as possible participants in a reverse commuting program. The North Avenue Corridor, is the identified area or pool for the

unemployed labor force. It forms a coherent and accessible area with relatively viable connections and accessibility to possible job centers in the suburbs.

JOB ACTIVITY LOCATIONS

Job activity locations for the North Avenue Corridor were defined as job locations that had employment opportunities for individuals who had the educational level of twelfth-grade or less and had little to no work experience. Residents that have been unemployed for some length of time, have limited work skills, or who have mandates to re-enter the work force due to welfare reform are in need of low skilled jobs.

Selection

In the Baltimore Region, Howard County and Anne Arundel County were selected for having the most job opportunities within a 20 to 90 minute commute suitable for Baltimore low-income residents of the North Avenue Corridor. Howard County was selected for transportation study as a job activity area because: (1) the county had the highest percentage in the number of jobs with a growth of 282% from 1970 to 1990, (2) the county is the only jurisdiction with a low percentage share of commuters who live and work in their respective jurisdictions, averaging about 36%. and (3) the geographic locations of the job opportunities are in general location, on an easily accessible route. According to the 1990 Census, 64.2% of Howard County's 109,843 workers had jobs outside of Howard County. This is a significant factor because Howard County has job opportunities not occupied by its residents. However, Anne Arundel County has the highest percentage of its residents working in its jurisdiction. Anne Arundel County was selected for

transportation study as a job activity area because: (1) the county experienced the highest absolute increase of workers with 112,800 in a 20-year period, representing 20% of all workers in Maryland, (2) the county had an increase of more than 100,000 jobs from 1970 to 1990, a growth rate of 81%, representing 18% of the State, (3) 60% of workers commute within the county, and (4) the county had the largest volume of current positions for unskilled labor that required a twelfth-grade education or less, according to the Automatic Labor Exchange Search System, and the Department of Labor, Licensing and Regulation, Columbia, Maryland Office.

Howard County

Howard County is situated in an exceptional geographic location some 20 to 30 minutes' commute from Baltimore City. The county's diverse business base ranges from high technology, telecommunications, and biotechnology companies to wholesale distributors, manufacturers, and research and development firms. The largest annual average employment industries are: service at 29,388; retail trade at 19,032; wholesale trade at 8,517; and local government at 8,019. Howard County has more than 6,901 businesses that employ about 83,706 workers; an estimated 141 of these businesses have 100 or more employees. Jobs in Howard County grew by 76% from 59,200 in 1980 to 104,400 in 1990. The county has the lowest unemployment rate in the Baltimore Region at 3.4%. The major private sectors of employers include Johns Hopkins University Applied Physics Laboratory, Allied Signal Technical Services Corp., Giant Food, Inc., The Rouse Company, the Ryland Group, and the Arbitron Company (Maryland Department of Business and Economic Development).

Howard County has a highly educated work force. The percentage of its population that has a high school education or higher is 91.1%. The percentage that has a Bachelor's Degree or higher is 46.9%. The occupational characteristics of this highly educated labor force are as follows: (1) 52.6% of the labor force work in executive, administrative, and managerial positions, professional specialties, and technical-related support jobs; (2) about 26.6% work in sales and administrative support jobs, including clerical positions; and (3) the remaining 11.7% work in manufacturing, trade, and distribution jobs. Approximately 31% of the labor force commutes to jobs in the Baltimore Region while some 34% commute to Washington, D.C. About 33% residents commute to work within the Howard County jurisdiction. This leaves opportunities for Baltimore City residents to work in the blue-collar jobs that are not occupied by Howard County residents. The U.S. Route 1 Corridor/Columbia Gateway Area Employee/Employer survey conducted by the Baltimore Metropolitan Council showed that only 24% of employees interviewed lived in Baltimore City. A reverse commuting program could increase that percentage of city resident employment and link unemployed city residents to Howard County jobs.

Current job listings, according to the Maryland's Automatic Labor Exchange Search System Database, July 7, 1997 data reveals 77 possible blue-collar job openings. These openings required a twelfth-grade education or less and required little to no work experience. On July 14, 1997, the number of available blue-collar job openings increased to 94 positions. Table 4 gives the job listings in the Baltimore Region. Along U.S. Route 1 starting at Interstate 195 to Jessup Route 175 and Route 175 along Columbia Gateway area, 58 "Help Wanted," "Now Hiring," and "Accepting Applications" postings were counted. Postings were observed at gas stations, fast

food restaurants, motels, factories, retail stores, and along the road. The Sun Paper had an average of 71 listings for the Howard County area covering the month of July 1997. The total job openings identified as suitable opportunities for North Avenue Corridor residents were 223 positions. The locations of available jobs in Howard County are:

Ellicott City

Elkridge

U.S. Route 1

Columbia

- Columbia Gateway Corporate business Park on MD Route 175 and I-95
- Gateway Commerce Center-Industrial Park located on Snowden River Parkway
- Columbia Mall, downtown Columbia, Retail Store and Businesses
- Corridor Industrial Park located at intersection of U.S. 1 and MD Route 32
- Guilford Industrial Park
- Oakland Ridge Industrial Center
- Sieling Business Park
- Owen Brown South
- Dorsey Hall Business Park
- Rivers Corporate Park
- Patuxent Woods Business Parks

Laurel

Jessup

Anne Arundel County

Anne Arundel County is in the corridor between Washington, D.C. and Baltimore City.

Annapolis, the State Capital and historic district, is a major tourist attraction for the State and the County. Annapolis has the highest number of jobs available for unskilled labor in the Region.

The county's economy is grounded in high-technology communications, distribution, and computerized support services. Growing industries include environment related technology, regional data centers, and life sciences. The Baltimore/Washington International Airport (B.W.I.), located in the Northwest section of the county has a growing base of international and domestic carriers. The B.W.I. area is a hub of commercial and industrial development supporting about 50% of all jobs and 57% of all companies in the county. Anne Arundel's 11,053 businesses employ well over 138,221 workers. An estimated 203 of these businesses have 100 or more workers. The major private sector employers include: ARINC, IIT Research Institute, Lockheed Martin, and Northrop Grumman ESSD (Maryland Department of Business and Economic Development). The unemployment rate for Anne Arundel is 4.1%

The educational levels of Anne Arundel County residents are as follows: (1) 81.1% of the population has a high school education or better; (2) 24.6% who have a Bachelor's Degree or higher; and (3) 18.9% who have less than high school education. Residents commuting outside the county to work in 1995 represent about 39% of the labor force. Approximately 61%, or 243,143 members of the labor force, work in Anne Arundel County. Although a large percentage

of residents work in the county, the large amount of job openings is more than enough to share with Baltimore residents.

Of Howard and Anne Arundel Counties, Anne Arundel had the largest number of low skilled jobs available. From the job database of July 14, 1997, 67 jobs were available in the county for those who had little or no experience. Table 4 shows that from the total job openings in the county, 136 out of 165 jobs were jobs requiring a twelfth-grade education with or without work experience. As discussed earlier in the field study 63 "Help Wanted" signs were counted along Veterans Highway and Ritchie Highway. The Sun Paper listed an average of 75 job openings located in Anne Arundel County for the month of July.

The locations of suitable jobs available are:

- Annapolis
- Friendship Park
 - B.W.I. and Aviation Blvd
- Brooklyn Heights
- Glen Burnie
 - Ritchie Highway
 - Veterans Highway

Baltimore County

In accordance with the criteria for selection, Baltimore County was omitted from the commuting study as a job activity area because: (1) its unemployment rate was above the 5.0 limit at 5.5%; and (2) the major employment characterized in this area is one of highly skilled specialized jobs. These highly skilled jobs required a twelfth-grade education or a college degree and/or a special license, credentials or skill. Jobs were located in Baltimore County in the following areas: Reisterstown-Owings Mills, Cockeysville, Pikesville, Security, Hunt Valley, and White Marsh. The Towson area was omitted altogether due to the fact that 92% of its job listings required a college degree or special skill. For notation, Towson Town Center had suitable job opportunities for North Avenue Corridor residents in the area of service and retail jobs.

Carroll County

Carroll County was omitted as a possible job activity area for the North Avenue Corridor because of the location of its job opportunities found in Westminster. By car, a commute to Westminster would be about 40 minutes. By transit bus, the commute would be more than 90 minutes. Unfortunately for Baltimore City, Carroll County has the largest number of unskilled job opportunities in the Baltimore Region.

Harford County

Harford County was also omitted because of (1) the distance of job locations and (2) the county did not have a significant job growth in the 20-year period between 1970 and 1990 (Baltimore

Metropolitan Council). Job locations found in Harford County were around the Belair-Fallston, Aberdeen-Havre De Grace, and Edgewood-Joppa areas.

Baltimore Region

As a whole, the Baltimore Region had 1,542 job listings in the database, of which 1,015 jobs were suitable for Baltimore City residents. The Sun Paper, had an average of 503 job listings that required a 12-grade education or less with or without work experience for the weeks of observation. Of these 503,145 jobs required six months or less for training such as health aids or nursing assistants.

Baltimore City had 219 job listings in the job database; however, 135 jobs required a college degree or special training, skills, or licensing. Only 84 jobs were considered to be blue-collar. Baltimore had the lowest suitable job listings in the region. Although the city remains a place of employment for many specialized professions, it falls short in meeting the needs of the majority of its residents.

Table 6 is a list of the locations of all the identified employment activity centers for the Baltimore Region. There are 30 or more areas and more than 1,000 businesses with available job opportunities. Figure 12 reveals the location of the job activity centers as well as the North Avenue Corridor. As can be determined, there is a disparity between the two factors of residency labor force and work sites.

Nowhere in the Region does one see the concentration of poverty found in the city.

Understanding that counties do have their own poor, Figure 13 shows the counties' income level as well above that of Baltimore City.

GENERAL OBSERVATIONS

It was observed in the field study that new constructions are rapidly undertaken in Howard and Anne Arundel Counties. A total of 23 sites was observed in Howard and Anne Arundel Counties.

On Route-175, there was a new construction of a restaurant with a large sign "Now Hiring." Nearby, space was available for other possible developments.

The roads in the counties are wide, very long, and mostly two and four lanes. The roads are also without sidewalks or bike paths and not pedestrian friendly. From a road test, for example, on U.S. Route 1, a warehouse job location was 1.3 miles from the bus stop. A walk from the bus stop to the job site would add at least an additional 20 minutes to the employee's commute time. Figure 8 shows the road conditions for several job locations. Traveling by means other than a vehicle (single, car-pool, van-pool) would be difficult in the counties. The simple act of crossing the street is not safe in some county areas. There are few stop light crossing areas or intersecting streets that allow street crossing by pedestrians. As shown in Figure 10, unsafe road conditions exist in Glen Burnie at Cromwell Metro Station. Even if one rides the Metro train to work, one is still confronted with getting across the busy street to walk to the job site or finding a transfer connection to the place of work. Observed at the Cromwell Metro station was a motorbike that could have been used for a commute to the station or possibly to the job site.

Also, observed in the field study was the number of warehouses and factories throughout the counties. Three companies are shown in Figure 11, illustrating that the jobs are available. However, they are mostly spread out and off the main roads.

CURRENT AVAILABLE TRANSPORTATION

Baltimore City has access to Interstate Highways I-83, I-95, I-395, I-695, and U.S. Route 1. Only I-695 does not intersect or actually come into the city. As demonstrated in Farkas' 1990 study, even with a car these highways are difficult to access from several city communities. The present option some city residents have is (1) to travel out of the city to connect with I-695 for the purpose of commuting to all parts of the region; or (2) travel through the city to downtown Baltimore to access I-95, I-395, and I-295 for a commute to the suburbs; or (3) travel across North Avenue going West to south Hilton Street, accessing I-95 off from Caton Avenue. From downtown, connecting points to I-83 are at North Avenue, Cold Spring Lane, Northern Parkway, and Falls Road. Traveling within the city, I-695 can be reached by way of I-83, Route 40, U.S. Route 1 and I-95. A commute by way of a vehicle would allow the individual to get to the job location in the suburbs within 20 to 60 minutes. From the North Avenue Corridor, I-83 is easily accessible at North Avenue and Mt. Royal, I-95 is accessible off of Martin Luther King Blvd., which is easily accessible from Howard Street and North Avenue. U.S. Route 1 can be accessed from I-95 or from Washington Blvd. off of Martin Luther King Blvd.

ORIGIN-DESTINATION

Mass Transit Administration (MTA) provides services to Baltimore City as well as Howard and Anne Arundel Counties. In order to assess the available transit service to residents in the North Avenue Corridor, public transportation for purpose of commuting out of Baltimore to the suburbs

was studied. Route information was provided by MTA. Starting at the origin of North Avenue, the present public transit commuting routes are:

- ! Bus route 13 travels along North Avenue at an average of 15-20 minute interval times. It has a 7-day operation schedule. There are four 13 bus routes (1) runs from the Walbrook Junction, Garrison and Bloomingdale to Canton around Boston and Toone; (2) runs to Fells Point near Lakewood and O'Donnell; (3) an express line runs to Towson; and (4) another express line runs to Hopkins/Providence Road. Transfer connections are available to bus routes: 1, 3, 5, 7, 8, 9, 10, 11, 15, 19, 20, 21, 22, 23, 27, 35, 36, 61, 64, and 91. A light rail stop is located at North Avenue near Howard Street and a Metro Station is located at Penn-North Metro Station off of Pennsylvania and North Avenue. Both lines are accessible to North Avenue Corridor residents by the route 13 bus line. Downtown Baltimore is accessible by way of light rail or Metro. Figure 14 is the route design for number 13 bus line. It would take anywhere from five to 20 minutes to get to downtown Baltimore from North Avenue, depending on how long one had to wait for the scheduled bus.
- ! Bus route 91 travels via Garrison Blvd. and provides service to Rogers Avenue Metro Station, Pimlico Race Course, Walbrook, Coppin State College, State Office Center, Baltimore Arena, and Charles Metro Station. It runs along North Avenue between Bloomingdale and a block up from Eutaw Place. This route would allow connections to Route 320 to Laurel and Routes 310 and 311 to Columbia downtown Baltimore. Figure 15 is the route design for the number 91 bus line. This allows access to bus lines: 1, 2, 5,

8, 9, 11, 20, 35, 36, 71, 140, 150, 160, 420, 61, 62, 64, 70, 3, 31, 10, 19, 19A, 27, 28, 320, 310, 311, 411, and 410.

! Light Rail service links Timonium and Cromwell Station/Glen Burnie via downtown Baltimore. A Hunt Valley extension is planned to open by the end of September 1997. Future extension plans are being considered for the Penn Station and B.W.I. Airport. There are 23 light rail stops. The trains run about every 15 minutes and operate seven days a week. Monday through Friday, the light rail operates from 5:00 a.m. to 11:00 p.m., on Saturday from 8:00 a.m. to 11:00 p.m. and on Sundays from 11:00 a.m. to 7:00 p.m. The fare is about \$1.35 per one way trip. From the light rail stop, transfer connections can be made with a bus route. North Avenue Corridor residents would have to ride the light rail to Patapsco Light Rail to connect with Route 17 to B.W.I. Airport area and Route 1 to Annapolis. Bus route 14 runs only from Patapsco Light Rail Stop to Annapolis and only connects with other bus routes at Patapsco Light Rail Stop. This is the same with Route 17 to B.W.I. Airport area. Figures 17 and 20 show the bus routes for the 14 bus line and the 17 bus line, respectively. Lines 22, 29, 30, 77, and 64 are accessible also at the Patapsco Light Rail.

! The following rails are available in the city; CSX Transportation, Conrail and the Canton Railroad (not commonly used for commuting); and the Amtrak and MARC Commuter Rail. The MARC Commuter Rail can be accessed at MARC Penn Station on Charles Street near Maryland Avenue, a few blocks down from North Avenue. The 13 bus route on North Avenue is in walking distance to the station. The MARC Commuter Rail

operates Monday through Friday only. Figure 17 shows the accessibility residents in the Baltimore Region have by utilizing the light rail, MARC, and Metro rail systems.

For a North Avenue Corridor resident to commute by public transit to the identified employment center, the following commuting routes are discussed:

! TO ROUTE 1

From Hopkins Place, the State Office Center located downtown Baltimore, bus route 320 has three A.M. scheduled express buses traveling from downtown at 6:13 a.m., 7:13 a.m., and 7:50 a.m. For the return trip to Baltimore in the evenings, the P.M. scheduled express lines are at 4:23 p.m. and 5:00 p.m. This service operates Monday through Friday. There are no services to South West Park-N-Ride in the morning. However, two express buses leave the South West Park en route to Baltimore at 7:14 a.m. and 8:04 a.m., and two express lines return to the South West Park-N-Ride in the evenings at 4:56 p.m. and 5:31 p.m.

Assessment: This service lacks accessibility to jobs on or around U. S. Route 1 for evening employment (2:00 p.m. to 10:00 p.m. and 3:00 p.m. to 11:00 p.m. shifts) and weekend employment. About 75% of employees in this area work six or seven days in a typical week. The bus route is along U. S. Route 1 and most of the businesses are located anywhere from a quarter mile to two miles from the main road. A trip from North Avenue Corridor would take one to two transfers and about one hour in travel time.

At present, the South West Park-N-Ride Station is being utilized Monday through Friday between 7:00 a.m. and 6:00 p.m. with the purpose of commuting suburban residents to the city. Other than personal vehicles, no other mode of transportation is used to commute.

! TO COLUMBIA

From Dolphin and Howard Street two bus routes are available, the 310 at 8:00 a.m., 4:37 p.m., and 5:07 p.m., and the 311 at 8:40 a.m., 4:32 p.m., 5:02 p.m., and 5:56 p.m. The services from Columbia to Baltimore in the evenings are the 310 at 3:45 p.m. and the 311 at 4:05 p.m. The service operates Monday through Friday.

Assessment: The availability and quality of reverse commuting public transit services are in no way comparable to traditional commute services. In comparison to those that run from Baltimore, more than twice the amount of scheduled express buses runs to Baltimore. The time frame on service from Baltimore to Columbia does not allow a person to work 8:00 a.m. to 4:00 p.m. or the 9:00 a.m. to 5:00 p.m. work shift. Like the 320 bus route, it does not allow for an evening or night shift employment. Both express lines limit transportation to weekend employment. The trip from North Avenue Corridor would take one to two transfers and could take more than 45 minutes to commute. The MARC trains stop at Dorsey, Jessup, Savage, and Laurel Race Track. Without a connecting ride, getting to the work site by foot is unsafe and time consuming.

! TO B.W.I.

North Avenue Corridor residents have the option to take the MARC train to B.W.I. or the Light Rail to Patapsco and transfer to the 17 bus line. At the MARC train station, shuttle buses are available to transport residents around the B.W.I. area. However, the 17 bus travels about

Friendship Park, B.W.I., and Aviation Boulevard, where many employers are located. The 17 bus line operates Monday through Saturday from 5:58 a.m. to 10:15 p.m. in one-and-a-half hour intervals.

Assessment: The commute on the bus could take 45 minutes to two hours. In most cases, a required walk to the work site may take another five to 10 minutes.

! TO ANNAPOLIS

Residents must catch the light rail at North Avenue near Park Avenue and take it to Patapsco Light Rail Stop where they would transfer to the 14 bus in order to get to Annapolis. The 14 bus line operates as a regular bus route Monday through Saturday from 5:30 a.m. to 10:40 p.m. in one hour intervals and on Sunday in one-and-a-half hour intervals.

Assessment: Using transit, the total commute from North Avenue Corridor would take one to two hours, while a trip in a vehicle would take 30 minutes.

The present transit service for commuting from Baltimore City to suburban jobs is too time consuming and inadequate to meet the needs of both employers and employees. The service presents hardships, limits job opportunities, is not user friendly, and presently discourage many from seeking employment in the counties. Figure 16, which shows MTA commuter service connections in Baltimore and the surrounding areas, also shows that the same services lack door-to-door service to job sites and fail to expand as newly created jobs occur in the counties.

COUNTY TRANSPORTATION SYSTEM

Howard Area Transit Service (HATS) is a general public transportation service owned and sponsored by Howard County, Maryland. It provides convenient, frequent bus service to downtown Columbia, Maryland, and the various village centers, Ellicott City's historic district, the county government office complex, Western Howard County, and the Columbia Gateway office complex. Seven routes are provided.

*Red/Blue operates on Saturdays only, between 9:00 a.m. and 6:55 p.m., providing service to Columbia Shopping Mall, Columbia Medical Plan, Long Reach Village Center, Dobbin Center, Snowden Square, Route 100 Industrial Park, and Elkridge.

*The Red Route operates Monday through Friday from 6:00 a.m. to 7:30 p.m., providing service to Columbia Shopping Mall, Columbia Medical Plan, Long Reach Village Center, Dobbin Center, Snowden Square, Columbia Gateway, and the Howard County Government Offices, which include the Department of Social Services and Department of Citizen Services.

*The Blue Route, discontinued in May 1997, Monday through Friday from 6:15 a.m. to 7:12 p.m., providing service to Elkridge Library /Senior Center, Route 100 Industrial Park, Columbia Parkway, and the Howard County Government Offices.

*The services also provide a Brown Route, Orange Route, Purple Route, Green Route, and Yellow route to areas not within the job activity center location of this report.

In summary, the transit services available only provide service during rush hours, and day-shift hours. Services are not provided during the evening or on Sundays. Figures 20, 21, and 22 give

the route layout for the HATS services. Jobs are located in small neighborhood shopping centers throughout Columbia, Maryland.

The Howard County Office of Commuter Assistance has a wealth of information on public transportation opportunities for individuals and employers in both the County and surrounding areas. The modes of transportation are ride-sharing or public transportation, car-pools, van-pools, buses, shuttles, MARC, or Metro.

Anne Arundel County is serviced by the MTA. The MTA offers various bus routes and light rail service throughout Anne Arundel County. Light rail lines connect Anne Arundel County with Baltimore city and Baltimore County. A new international pier with a light rail terminal will be in full operation at B.W.I. by 1997. Like Howard County, Anne Arundel County has ride-sharing programs and a database of van-pools and car-pools available for commuters. Interstate Highways U.S. 50/301 (I-195), I-97, I-95, I-695, and the Baltimore/Washington Parkway Route 295 are accessible to Anne Arundel County.

ALTERNATIVES

To increase the use of public transportation by individuals now commuting to work by car as well as those who depend on public transportation as their only means of transportation, a network must be formed and operative. There are a number of alternatives or initiatives that will enhance reverse commuting and other non-traditional transit services. To achieve success in matching North Avenue Corridor residents in Baltimore City with job opportunities in the suburbs, transit systems should consider entering into mutually beneficial partnerships with community groups, social service providers, employers, schools, transportation management, government agencies, organizations, and others.

ALTERNATIVE 1-Utilization of Park-n-Ride Stations

A decrease in the number of commuter cars traveling to Baltimore City occurred with the creation of Park-n-Ride stations. These stations, located in the suburbs, were established to make commuting to the city more inviting and convenient to travelers. The stations, provide commuters with an opportunity to park their cars and board an express bus to the city, thereby decreasing congestion and limited city parking problems.

Park-n-Ride stations are only utilized Monday through Friday between 7:00 a.m. and 6:00 p.m. In the morning, buses leave the stations with express routes to the city. This alternative proposes that express buses be routed from downtown Baltimore to Park-n-Ride stations in the morning in order to transport city residents to the suburbs. Morning scheduled bus service from the station

to the city will continue. For reverse commuting, express buses will be routed from the station to Baltimore City in the evenings. Evening scheduled bus service from the city to the station will continue. Once city residents are at the station, they will be picked up by contracted car-pools, van-pools, or ride-sharing programs that would provide door-to-door service to job sites. This can be done in partnership with employers and agencies. Promoting the use of car-pools, van-pools, and ride-sharing are effective, low-cost management options that can reduce rush-hour traffic and congestion. Such ride sharing would lower the cost of commuting for employees and serve as a recruiting tool by employers.

ALTERNATIVE 2-Self Empowerment

City residents will be encouraged to establish their own transportation businesses. Grants and loans will be given by the Federal and State Government. Residents may purchase a van or bus for the purpose of transporting city residents to and from job sites, providing 24-hour service. Contracts would be obtained by employers, the Department of Social Services, or individual riders. Low-cost cars could be offered to city residents for a reverse commute. These cars could be donated, managed by a non-profit organization and distributed to needy city residents. A lease or rent-to-own plan could be used for distribution. Local community groups could also establish reverse commuting programs.

ALTERNATIVE 3-Network System

This alternative proposes a web for information exchange and linkage for a common cause-- reverse commuting. It consists of many players and subdivisions of federal, state, and local

government agencies. A transportation network between counties and public and private organizations will improve the accessibility, availability, and effective quality of service. For example, Howard County conducted a survey of 22 employers in the U.S. 1 Corridor. From the study, a Blue Route that provided transportation service along U.S. 1 was established by HATS. After three months, the route was discontinued due to lack of rider participation. If a network system was in operation, the Department of Employment would have directed unemployed individuals to U.S. Route 1 area. During the route operation time, more than 15 employers along U.S. Route 1 had signs up requesting help. The Department of Social Services would have been able to direct individuals who must come off AFDC grants to U.S. Route 1 for employment. Many jobs, such as those in Subway and Taco Bell, require little to no work experience. The County Commuting Assistance program would have given information to the Department of Employment and Social Services to connect possible employees with employers by public and private transportation.

The MTA could recognize its policies, programs, and commitments with a view of increasing its involvement in reverse commuting. A course of action that could be effective immediately would be to examine the routing, and scheduling of existing bus lines with an aim to adjust them to include the need of the reverse commuters.

CONCLUSION

This research study identified the North Avenue Corridor as a low-income area in Baltimore City in need of transit services for the city to suburb commute. Therefore, the study established a labor pool of unemployed city residents that would best benefit from a reverse commuting program. In the findings, Anne Arundel and Howard Counties were identified as job activity areas best suited for the North Avenue Corridor residents. Both counties demonstrated the ability to provide employment to Baltimore City residents. These counties have plenty of jobs available to meet the unemployment needs of their own jurisdictions, as well as those of Baltimore.

Analysis of available transit service demonstrated a need for public reverse commuting programs.

Such programs would solve the problem of inaccessibility between inner-city resident and suburban jobs. Contributing to previous studies, this research offered alternative programs as recommendations to the improvement of the availability and quality of reverse commute public transit services.

The unemployment problem facing Baltimore City due to suburbanization could be mitigated if the city residential labor pool was able to obtain current information about available employment opportunities located in the suburban areas. Along with employment opportunity information, the city's residential labors pool should be provided with needed information on various reverse commuting programs and transportation services in order to attain accessibility to job locations.

The exchange of information and an organized network system would encourage city residents to seek employment in suburban areas.

The challenge of reverse commuting for Baltimore City does not lie only in the hands of the Mass Transit Administration (MTA), and local private transit services, such as Howard Area Transit Service (HATS). The challenge is posed to state and local governments, the Department of Social Services, the Department of Employment, private employers, economic developers, and planners. What is needed is a partnership consisting of the whole Baltimore Region. The problem of centralized poverty and unemployment was not created alone and hence cannot be solved alone by Baltimore. Baltimore City's problem is a regional problem affecting the whole State of Maryland.

Needed in the Baltimore Region are basic origin-destination studies to pinpoint where privately-owned residents work or could possibly work and how they can be serviced best. Reverse commuting does not occur only in single occupant vehicles and buses. Other modes used to meet reverse commute needs include rail, shuttle vans, van-pools, motorbike, car-pools, and ride-sharing programs. To eliminate the disparity between city residency and suburban jobs, reverse commuting programs should be established to provide door-to-door service or provide transportation from the nearest bus or rail line to the job site and back. Programs that provide reverse commuting services could either be done in partnership or individually by the employers, the employees, the local community around the job site, the local community at the residence of the workers, or by government agencies. Such endeavors need to be supported by federal, state, and local governments.

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Table 1
LIST OF CENSUS TRACTS

TRACT	BOUNDARIES
CT 802	B&O RR, Belair Rd., Sinclair Iai Edison Highway.; E. Federal St.; N. Chester St., Sinclair La., Saint Lo Dr.
CT 805	B&O RR; Saint Lo Dr., Sinclair La., N. Chester St.; E. North Ave.; Harford Rd.
CT 806	E. North Ave.; N. Chester St.; E. Federal St.; N. Caroline St.
CT 908	B&O RR; Harford Rd.; E. North Ave.; Greenmount Ave.
CT 909	E. North Ave.; N. Caroline St.; E. Preston St.; Greenmount Ave.
CT 1204	E. 24th St., Barclay St., E 24th St.; Greenmount Ave.; E. North Ave.; Saint Paul St.
CT 1205	W. North Ave., E. North Ave.; Greenmount Ave.; E. Preston St.; Center line of Jones Falls Expressway (I-83).
CT 1206	W. 29th St., E. 29th St.; Saint Paul St.; E. North Ave., W. North Ave.; N. Howard St.
CT 1301	Cloverdale Rd., Druid Hill Lake Dr.; Center line of Jones Falls Expressway (I-83), Newington Ave. Extended, Newington Ave., Callow Ave., Whitelock St.; Madison Ave.
CT 1302	Whitelock St., Callow Ave., Newington Ave., Newington Ave. Extended; Center line of Jones Falls Expressway (I-83); W. North Ave.; Eutaw Pl.
CT 1303	N. Fulton Ave., Druid Hill Ave.; Cloverdale Rd.; Madison Ave., Whitelock St., Eutaw Pl.; W. North Ave.; Pennsylvania Ave.
CT 1401	W. North Ave.; Center line of Jones Falls Expressway (I-83); N. Howard St.; N. Martin L. King, Jr. Blvd.; Eutaw Pl.
CT 1402	Laurens St.; Eutaw Pl.; W. Lafayette Ave.; N. Fremont Ave.
CT 1403	W. North Ave.; Eutaw Pl.; W. Lafayette Ave.; N. Fremont Ave.

Table 2
TEST VARIABLES

Census Tracts	Median H.H. Income	Percent Below Poverty Rate	Percent College Education	Percent Labor Force	Percent Unempl. Rate	Car Ownshp. Rate
CT1401	\$16,257	26.0	42.0	58.0	6.9	54.0
CT1402	\$15,440	41.5	7.9	60.1	18.0	74.0
CT1403	\$16,352	37.9	11.2	57.6	9.9	37.0
CT1301	\$10,424	40.7	13.8	51.6	8.2	31.0
CT1302	\$19,241	40.1	29.9	62.1	16.5	43.0
CT1303	\$15,995	42.1	10.0	53.8	10.5	37.0
CT1204	\$18,357	32.5	42.0	61.3	17.9	33.0
CT1205	\$12,939	49.6	6.3	51.0	16.9	25.0
CT1206	\$12,292	30.9	31.5	57.8	5.5	40.0
CT909	\$15,259	38.7	1.3	53.7	20.0	38.0
CT908	\$21,125	29.2	4.2	60.1	11.2	44.0
CT802	\$16,468	38.6	1.8	55.0	17.0	37.0
CT805	\$21,667	22.2	53.0	61.9	18.0	54.0
CT806	\$17,225	36.9	2.8	53.3	18.3	36.0
Average	\$16,289	36.0	18.0	57.0	14.0	42.0
Baltimore City	\$24,045	21.9	15.5	60.4	9.2	62.0
Maryland State	\$39,386	8.3	26.5	70.6	4.3	88.0

**Table 3
POPULATION**

Tracts	Total	% of Labor Force	Labor Force	% of Car Own.	Car Own.	Transit Dep.	% of Pop. Unemp.	Unemp.	% of No Cars	Study Pool
CT802	4,280	55.0	2,354	37.0	871	1,483	17.0	400	63.0	252
CT805	2,831	61.9	1,752	54.0	946	806	18.0	315	46.0	145
CT806	5,384	53.3	2,870	36.0	1,033	1,837	18.3	525	64.0	336
CT908	5,427	60.1	3,262	44.0	1,435	1,827	11.2	365	56.0	204
CT909	4,663	53.7	2,504	38.0	952	1,552	20.0	501	62.0	311
CT1204	3,145	61.3	1,928	33.0	634	1,294	17.9	345	67.0	231
CT1205	2,337	51.0	1,192	25.0	298	894	16.9	202	75.0	152
CT1206	2,506	57.8	1,449	40.0	580	869	5.5	797	60.0	478
CT1301	4,101	51.6	2,116	31.0	656	1,460	8.2	174	69.0	120
CT1302	3,426	62.1	2,128	43.0	915	1,213	16.5	351	57.0	200
CT1303	3,350	53.8	1,802	37.0	667	1,135	10.5	189	63.0	119
CT1401	5,535	58.1	3,216	54.0	1,737	1,479	6.9	222	46.0	102
CT1402	3,738	60.1	2,247	74.0	1,663	584	18.0	405	26.0	105
CT1403	4,409	57.6	2,540	37.0	940	1,600	9.9	252	63.0	159
Totals	55,132	57.0	31,360	42.0	13,327	18,033	13.9	5,043	58.0	2,914

Compiled by author

Table 4
JOB LISTINGS

Geographic Area	Job Requirements	July 1997 Listings	August 1997 Listings
Howard County	Total Job Listings	131	188
	Jobs requiring a college degree with experience	27	16
	Jobs requiring special training and skills	10	32
	Jobs requiring 12th grade education with experience	77	101
	Jobs requiring 12th grade or less education with no experience	17	39
Anne Arundel County	Total Job Listings	165	285
	Jobs requiring a college degree with experience	17	29
	Jobs requiring special training and skills	12	31
	Jobs requiring 12th grade education with experience	73	148
	Jobs requiring 12th grade or less education with no experience	63	77
Baltimore County	Total Job Listings	336	477
	Jobs requiring a college degree with experience	79	91
	Jobs requiring special training and skills	178	225
	Jobs requiring 12th grade education with experience	80	103
	Jobs requiring 12th grade or less education with no experience	36	58

TABLE 4, Continued

Carroll County	Total job listings	346	353
	Jobs requiring a college degree with experience	21	19
	Jobs requiring special training and skills	32	38
	Jobs requiring 12th grade education with experience	156	198
	Jobs requiring 12th grade or less education with no experience	169	98
Harford County	Total job listings	245	224
	Jobs requiring a college degree with experience	19	23
	Jobs requiring special training and skills	100	87
	Jobs requiring 12th grade education with experience	54	38
	Jobs requiring 12th grade education with no experience	72	76

Source-Automated Labor Exchange Search System

Table 5
Jobs Requiring No Experience
(as of July 14, 1997)

Total Baltimore Metro Area	169	
Requiring 12th grade education or less		135
Requiring a degree		34
Full-time employment		132
Part-time employment	37	
Baltimore City	37	
Requiring 12th grade education or less		26
Requiring a degree		11
Full-time employment		29
Part-time employment	8	
Baltimore County	52	
Requiring 12th grade education or less		38
Requiring a degree		14
Full-time employment		37
Part-time employment	15	
Anne Arundel County	67	
Requiring 12th grade education or less		66
Requiring a degree		1
Full-time employment		52
Part-time employment	15	
Harford County	75	
Requiring 12th grade education or less		74
Requiring a degree		1
Full-time employment		50
Part-time employment	25	
Howard County	19	
Requiring 12th grade education or less		19
Requiring a degree		0
Full-time employment		18
Part-time employment	1	

Compiled by author

Table 6
Employment Activity Centers

Anne Arundel County
Annapolis
Glen Burnie
Ritchie Highway
Veterans Highway
Friendship Park
B.W.I.
Aviation Blvd.
Brooklyn Heights
Baltimore County
Reisterstown-Owings Mills
Cockeysville
Pikesville
Security
Towson*
Hunt Valley
White Marsh
Harford County
Belair-Fallston
Aberdeen-Havre De Grace
Edgewood-Joppa
Howard County
Ellicott City
Elkridge
Route 1
Columbia
Corridor Industrial Park
Gateway Commerce Center
Guilford Industrial Park
Oakland Ridge Industrial Center
Sieling Business Park
Owen Brown South
Dorsey Hall Business Parks
Rivers Corporate Park
Patuxent Woods Business Parks
Laurel
Jessup
Carroll County
Westminster

Identified by survey of employment data and observations

