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Low-Wage Labor and Access to Suburban Jobs

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16. Abstract

The objectives of this study are to examine the transportation factors constraining low-wage city labor from commuting to suburban job opportunities, to examine available transportation service options for reverse commuting to suburban activity centers, and to provide recommendations for improving accessibility to these activity centers.

The findings of this study are that transit travel times and costs in Baltimore City severely constrain commuting to suburban jobs by low-wage city labor, that suburban activity centers are relatively inaccessible from many areas of the city, and that the availability, quality, and speed of reverse commute public transportation services have been worse than for suburb-to-city commuting.

The authors conclude that there is substantial demand for various public transportation services. As present the options for reverse commuting are limited.

The policy recommendations are: increase the amount of low-income housing in suburban areas and improve the availability, quality and speed of public transportation.

The programmatic recommendations are: (1) cost-effectively reconfigure existing transit routes to provide more convenient reverse commute services; (2) brokerage services should match commuters with a range of public transportation alternatives; (3) aggressively market carpool and vanpool programs to low-wage labor; (4) reform common carrier and taxi regulations to allow new for-profit public transportation services; (5) provide more opportunities for services under contract; (6) increase state and federal subsidies to private sector providers; (7) provide marketing and planning assistance to private sector providers.

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PREFACE

Several individuals representing state and city agencies deserve our sincere thanks for their efforts in making this report possible. Mr. Bryan Bettlyon of the Baltimore Regional Council of Governments provided much data on transportation characteristics in the metropolitan area. Mr. Thomas Wendell and Ms. Susan Bass of the State Office of Unemployment Insurance provided helpful comments on the survey questionnaire and allowed us to apply the survey at unemployment offices in the metropolitan area. Ms. Linda Harris, Mr. James Ethridge, and Mr. Thompson Betts of the Baltimore City Office of Employment Development were instrumental in arranging, distributing, and conducting the survey at their offices throughout the city. Three students provided valuable assistance on this project and we thank them as well: Gabriel Eze, Seifu Kerse, and Legesse Negash.

The authors take sole responsibility for the accuracy of the analyses and for the conclusions/recommendations in the report. The preparation of this report has been financed through a grant from the University Research Program of the Urban Mass Transportation Administration. The contents of this report reflect the views of the authors and not necessarily the views of the Urban Mass Transportation Administration.

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INTRODUCTION: SUBURBANIZATION AND UNEMPLOYMENT

Problem Statement

The increasing disparity between employment and residential locations of low-wage labor in metropolitan areas is magnifying the socioeconomic polarization that began many decades ago. The problem of matching unemployed, inner-city labor with suburban jobs has justifiably received renewed attention. The economic development efforts of many cities and counties and Urban Mass Transportation Administration (UMTA) policies promoting private sector reverse commute services are evidence of that attention. Recent publications have also focussed on the connection between suburbanization of employment opportunities and high unemployment among low-wage inner-city labor.

According to a report of the National League of Cities, the percentage of people in Baltimore living in extremely poor neighborhoods grew from 28 per cent to 34 per cent between 1970 and 1980 (Hughes, 1989). As in other major cities, these neighborhoods have been transformed into expanding ghettos that are far from job opportunities. The study found that there is a positive relationship between size of ghettos and level of employment decentralization and that poverty is a common phenomenon primarily among blacks and hispanics. The report concludes that the growth and concentration of poverty was caused by the decreasing demand for unskilled workers and the relocation of jobs to the suburbs.

In a major work devoted to the interrelationships between transportation and suburban activity centers, Cervero notes that the suburbanization of work places aggravates the high jobless rates among inner-city minorities (Cervero, 1986). Suburban activity centers are defined as "major employment concentrations located outside of the Central Business District (CBD)" (Rice Center, 1987). Inadequate reverse commute public transportation and the high cost of housing in suburban areas deter inner-city labor from reaching jobs at these activity centers. Ottensman published a study of the changes in accessibility to employment in the Milwaukee Metropolitan Area (Ottensman, 1980). He found that districts within Milwaukee with the poorest people and the lowest quality housing experienced the greatest deterioration in accessibility to employment opportunities because of suburbanization.

The concern over inner-city unemployment and reverse commuting to suburban jobs was first manifested in the literature during the late 1960s and early 1970s. McKay reported on the extent of suburban employment of inner city residents in six major metropolitan areas (McKay, 1973). He found that a larger proportion of blacks traveled to the suburbs than whites, except in Los Angeles with its large hispanic population, and males travelled more than females. In an ambitious research effort Notess studied trends in the location of jobs for black workers in Buffalo, NY (Notess, 1972). The study showed that a typical worker could reach more than 25 percent more jobs by a half-hour

bus trip in 1952 than in 1968 because of the movement of jobs to suburban locations. The average journey to work from the inner city by automobile took 12 minutes in 1968, while the average travel time by bus was 30 minutes. Yet, the number of jobs that could be reached by automobile in 12 minutes exceeded the number that could be reached by bus in 30 minutes. The study also found that the percentage of inner-city workers employed beyond the city limits increased sharply from 17 percent to 30 percent between 1960 and 1968. However, 42 percent of the sample of unemployed workers without automobiles would not commute 30 minutes by bus to a suburban job.

A study by the National Urban Coalition focussed on the effectiveness of urban transit systems for commuting by disadvantaged labor (Hughes, 1970). The author found that transit systems were oriented toward collecting suburban residents for line-haul service to the CBD. Reverse commuters often found the collection points in the city to be inconvenient and the suburban destinations to be considerable distances from job sites. Bigler and Keith reported that the time and cost of reverse commuting by transit was almost prohibitive to the urban poor (Bigler and Keith, 1972). The attempts of several cities to establish reverse commute services were often beset by a variety of problems, such as lack of commitment and high cost/revenue disparities.

Research Hypotheses and Objectives

It is apparent from the literature that the geographic disparity in metropolitan areas between employment and residence of low-wage labor has not been overcome by public transportation. While mobility of inner-city labor involves a host of other issues, including wages, housing, education, and child care, given the reality of existing residential patterns, transportation is a critical factor. The authors contend that low-wage labor, not unlike other income groups, would demand frequent, high quality, and speedy transportation services for commuting to suburban employment. The hypotheses of this study are that automobile and, particularly, transit travel times and costs in Baltimore have severely constrained commuting to suburban jobs by low-wage city labor, that suburban activity centers are relatively inaccessible from many areas of the city, and that the availability, quality, and speed of reverse commute public transportation services have been generally worse than for suburb-to-city commuting.

The objectives of this study are to examine the transportation factors constraining low-wage city labor from commuting to suburban job opportunities, to examine available transportation service options for reverse commuting to employment at suburban activity centers, and to provide recommendations for improving accessibility to these activity centers. The study will examine the conditions within the Baltimore Metropolitan Area, conditions that are similar to those

in other large metropolitan areas.

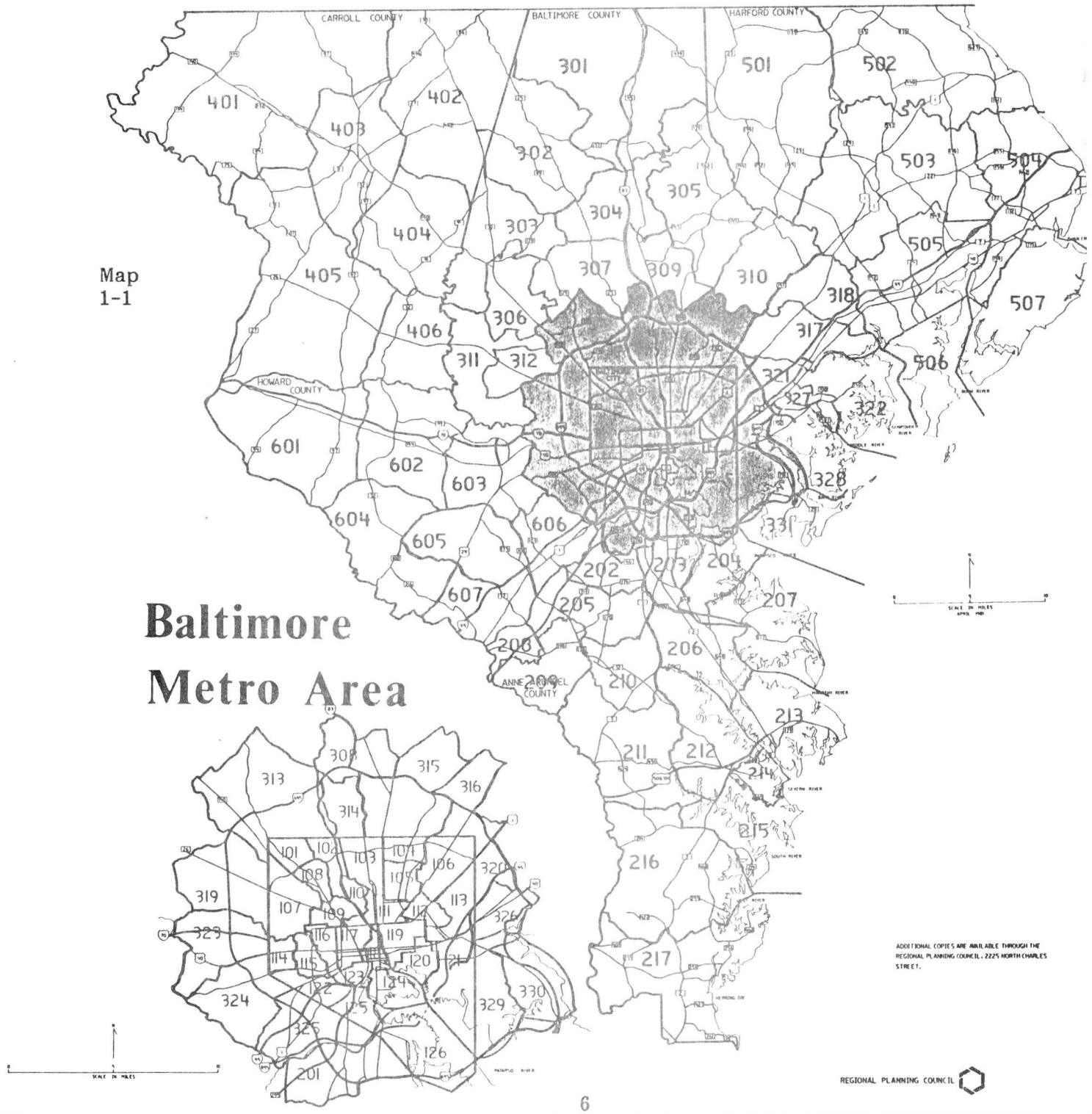
The Baltimore Metropolitan Area

The Baltimore Metropolitan Area consists of Baltimore City and the counties of Anne Arundel, Baltimore, Carroll, Harford, and Howard (Map 1-1). The metropolitan area has been undergoing an economic and geographic restructuring, which has had a profound impact on job accessibility. For many years the metropolitan area was characterized as a "blue collar" central city, dominated by heavy manufacturing industries, surrounded by suburban counties with "bedroom communities" and an agricultural economic base. The traditional residential patterns and CBD-oriented flow of commuters along radial roads and transit routes resulted in a positive association between distances travelled and household income.

Since 1970, the metropolitan area has been evolving toward a high technology and services economy and has continued to decentralize its employment and population, while its built-up area has increased in extent. This economic and geographic evolution has certainly not affected all jurisdictions in the Baltimore Metropolitan Area equally. The urban decentralization has involved jobs at all skill levels and middle to upper-income households, while low-income, transit dependent households have remained in the inner-city.

Firms in many suburban locations are finding it difficult to attract low-wage and low-skilled labor. As of April 1989, the unemployment rate in the City of Baltimore was 6.6 per cent,

Map
1-1



REGIONAL PLANNING DISTRICTS

BALTIMORE CITY

101 UPPER PARK HEIGHTS
102 MOUNT WASHINGTON
103 ROLAND PARK
104 CHINQUAPIN
105 GOWANS-NORTHWOOD
106 HAMILTON
107 FOREST PARK
108 LOWER PARK HEIGHTS
109 DRUID HILL
110 HAMPDEN
111 WAVERLY
112 CLIFTON
113 GARDENVILLE
114 TEN HILLS
115 IRVINGTON
116 ROSEMONT
117 WEST BALTIMORE
118 METROCENTER
119 EAST BALTIMORE
120 HIGHLANDTOWN
121 CANTON
122 MORRELL PARK
123 CARROLL PARK
124 SOUTH BALTIMORE
125 CHERRY HILL
126 BROOKLYN

ANNE ARUNDEL COUNTY

201 BROOKLYN HEIGHTS
202 FRIENDSHIP
203 GLEN BURNIE
204 MARLEY NECK
205 STEWART CORNER
206 SEVERNA PARK
207 MOUNTAIN ROAD
208 MARYLAND CITY
209 FORT MEADE
210 ODENTON
211 CROFTON
212 EPPING FOREST
213 BROADNECK
214 ANNAPOLIS
215 HILLSMERE
216 DAVIDSONVILLE
217 DEALE

BALTIMORE COUNTY

301 HEREFORD - MARYLAND LINE
302 PRETTYBOY
303 FOWBLESBURG
304 SPARKS
305 JACKSONVILLE
306 REISTERSTOWN - OWINGS MILLS
307 CHESTNUT RIDGE
308 LUTHERVILLE
309 COCKEYSVILLE - TIMONIUM
310 FORK
311 HARRISONVILLE
312 RANDALLSTOWN
313 PIKESVILLE
314 RUXTON
315 TOWSON
316 PARKVILLE
317 PERRY HALL - WHITE MARSH
318 KINGSVILLE
319 LOCHEARN
320 OVERLEA
321 ROSSVILLE
322 WINDLASS
323 SECURITY
324 CATONSVILLE
325 ARBUTUS - LANDSDOWNE
326 ROSEDALE
327 MIDDLE RIVER
328 ESSEX
329 DUNDALK - TURNERS STATION
330 NORTH POINT
331 EDGEMERE

CARROLL COUNTY

401 TANEYTOWN
402 MANCHESTER
403 WESTMINSTER
404 FINKSBURG
405 MOUNT AIRY
406 ELDERSBURG

HARFORD COUNTY

501 JARRETTSVILLE - NORRISVILLE
502 CARDIFF - DARLINGTON
503 BEL AIR - FALLSTON
504 ABERDEEN - HAVRE DE GRACE
505 EDGEWOOD - JOPPA
506 ARMY CHEMICAL CENTER
507 ABERDEEN PROVING GROUNDS

HOWARD COUNTY

601 COOKSVILLE
602 WEST FRIENDSHIP
603 ELLICOTT CITY
604 CLARKSVILLE
605 COLUMBIA
606 ELKRIDGE
607 LAUREL

while for the metropolitan area as a whole, the unemployment rate was 4.2 per cent (OLMA, 1989). Howard County, located in the corridor between Baltimore and Washington, DC and the fastest growing county in the Baltimore Metropolitan Area, had an unemployment rate of 2.2 per cent. In 1988 the metropolitan area had average annual unemployment rates of 3.2 percent for whites and 12.2 percent for blacks (BLS, 1989). The metropolitan area has a civilian labor force of 1,192,718 and at-place employment of 1,143,183. Maryland Department of Economic and Employment Development (DEED) data also indicate that at-place employment and labor force have continued to decline in the city and increase in the suburban counties during the 1980s. Yet, the disparity between the available labor force and the number of jobs remains high in the city and low in the suburban counties.

Much of the labor force in suburban counties commutes to other jurisdictions for employment. According to a 1988 unpublished survey of households by the Baltimore Regional Council of Governments (BRCOG), formerly the Regional Planning Council (RPC), the percentages of residents in each county commuting to jobs outside the county of residence ranged from 41 per cent to 61 per cent. The percentage of Baltimore City residents commuting to jobs outside the city was only 24 per cent, despite increasing rates of automobile ownership during the 1980s. Thus, despite the loss of at-place employment in the city over the years, city residents are less willing and/or less able to commute to job opportunities outside their jurisdiction of

residence than suburban county residents.

Report Organization

The final report of this study is organized as follows: Chapter One introduces the research problem, provides some background information, and states the research hypotheses and objectives of the study. Chapter Two explains the study approach and the methodology used to research the problem. Chapter Three discusses the metropolitan area's employment, commuting, and suburban development trends. Chapter Four evaluates the relative accessibility from areas of the city to suburban activity centers and provides the results of employer surveys at various activity centers. Chapter Five relates the results of surveys of unemployed city labor regarding attitudes toward commuting in the metropolitan area and quantifies the relationships between commuting and labor force characteristics. Chapter Six describes the area's transportation resources and the availability of public and private sector public transportation services. Chapter Seven summarizes the entire research report, makes conclusions regarding accessibility and unemployment, and provides policy recommendations regarding labor mobility, employment, and reverse commute transportation services.

CHAPTER 2

METHODOLOGY

The study approach and methodology relied heavily on administration of surveys and statistical analysis of survey results and traffic simulation data. The study also involved reviews of local studies and reports on regional commuting and economic trends.

A five-phase work plan comprised the research effort. In phases I and II the study team, consisting of three principal investigators and three research assistants, gathered and evaluated primary and secondary data to gain an understanding of the metropolitan area's employment trends, constraints on employment, accessibility to employment, and available public transportation services. Based on this understanding, the study team developed and used a descriptive analytic approach in Phase III to analyze the relationships between accessibility and unemployment. Phase IV consisted of summarizing the results, drawing conclusions, and making recommendations. Phase V included completion of all project documentation and information dissemination.

In Phase I the study team assembled and reviewed the literature on suburbanization and reverse commuting and the aggregate data on employment, commuting to work, automobile and transit trip distances and travel times, and work trip mode choice in the metropolitan area. Employment data were extracted from various reports and studies provided by DEED and BRCOG. The

data on commuting to work came from BRCOG, which compiled Census of Population data for 1970 and 1980 and conducted a survey on commuting in 1988.

BRCOG's traffic simulation model provided data on automobile and transit travel times, distances, and mode choice between all Baltimore City Regional Planning Districts (RPDs) and suburban activity center RPDs. RPDs are sub-county or sub-city areas that represent neighborhoods or places, but are actually aggregations of census tracts rather than politically or historically designated areas. BRCOG uses RPDs for planning and data aggregation purposes. The traffic simulation data came primarily from the 1980 Census of Population and from the most recent simulation of transit travel in 1985. The study team also reviewed locally produced reports by the Maryland Department of Transportation (MDOT) and BRCOG on transportation infrastructure and services in order to gain insight into the availability and quality of public transportation.

Phase II was a central focus of the study, consisting of review of BRCOG's employer surveys and conduct of a survey of over 500 unemployed, low-wage city residents seeking employment. These surveys concentrated on the importance of transportation access and other factors affecting employment at suburban activity centers.

Activity centers are those business and employment centers designated by BRCOG as major sources of congestion or potential sources of congestion warranting traffic management or other

solutions to enhance labor mobility. Activity centers are major nodes of industrial, commercial, and residential development in the metropolitan area. The employment and transportation data for these activity centers were available at BRCOG on the RPD level. For purposes of this research the study team selected the following activity centers in the metropolitan area: Baltimore Washington International Airport (BWI Airport) in Anne Arundel County; Hunt Valley, Owings Mills, Towson, and White Marsh in Baltimore County; and Columbia/Route 1 in Howard County.

BRCOG or other organizations in cooperation with BRCOG surveyed employers at four suburban activity centers, BWI Airport, Columbia/Route 1, Hunt Valley, and Towson, over a period of four years prior to this research effort. The employer surveys were distributed to a sample of employers located at each activity center. The employers represented firms of various sizes and industries. The study team evaluated the employer survey results to determine the employers' perceptions regarding transportation needs of employees and efforts to assist employee commuting. At the time of this study BRCOG had not conducted employer surveys at Owings Mills and White Marsh. The study team considered the survey results from the four activity centers as adequately representative of accessibility and commuting conditions at activity centers in general.

The survey of low-wage, unemployed city labor consisted of the administration of survey questionnaires to individuals seeking work through the Baltimore City Office of Employment

Development and those seeking unemployment compensation through the State Unemployment Insurance Administration. Members of the study team and personnel from these two government agencies administered the survey from early January to late February 1989. The survey objective was to query unemployed workers concerning employment status, education levels, demographic characteristics, income levels, as well as their perceptions regarding the constraints of cost, time, and availability of transportation service on commuting to suburban jobs (see Appendix A). The survey questionnaire was designed to determine the actual commuting behavior or "revealed preferences" and minimize the inaccuracy of "stated preferences" for commuting (Izraeli and McCarthy, 1985; Kroes and Sheldon, 1989; Wardman, 1989).

The survey effort included the design of the survey questionnaire, administration of the questionnaire at government offices, and data coding, input, and analysis. The data from the unemployed residents survey were coded and input into the mainframe computer system at Morgan State University.

In Phase III, using the simulated travel time data, the study team calculated measures of relative accessibility to all suburban activity center RPDs from each city RPD. The accessibility measures were mapped as a first step in the spatial assessment of accessibility to suburban employment opportunities. Next, the study team compared automobile and transit "running" times in both directions between suburban activity center RPDs and representative city RPDs. Finally, the study team analyzed

the relationships among mode choice, travel times and accessibility to suburban activity centers, and characteristics of unemployed individuals, using the SPSS frequency distribution and multivariate statistical analyses. These relationships provided the basis for making recommendations concerning supply and management of public transportation services, as means of improving the accessibility of low-wage, unemployed city labor to suburban employment opportunities.

CHAPTER 3

EMPLOYMENT AND COMMUTING IN THE METROPOLITAN AREA

Employment Trends

The Baltimore Metropolitan Area has experienced employment trends similar to that of other economically healthy metropolitan areas. According to a major study of employment and commuting by BRCOG, the metropolitan area exhibited tremendous growth in the number of employed persons or workers between 1960 and 1980 (Goodman and Bailey, 1985). The total number of workers grew from 676,742 to 967,136, a 43 percent increase (Table 3-1). Baltimore County experienced the greatest absolute increase in workers over the period, 139,854, while Howard County experienced the greatest relative increase of 355 percent. However, the proportion of the region's workers residing in Baltimore City declined from 53 percent in 1960 to only 31 percent in 1980.

During the period 1964 to 1980, the metropolitan area experienced a 40 percent increase in employment from 758,300 jobs to 1,058,000 (Table 3-2). Baltimore County experienced the greatest absolute increase in the number of jobs, 141,900, while Howard County experienced the greatest relative increase in employment of 465 percent. Baltimore City experienced an increase in jobs from 436,900 to 473,400 between 1964 and 1970, but the number of jobs declined to 458,600 by 1980. Accordingly, Baltimore's relative share of metropolitan employment also declined from 58 percent in 1964 to 43 percent in 1980.

Between 1980 and 1985 the metropolitan area's labor force

Table 3-1

Employed Persons by Place of Residence
Baltimore Metropolitan Area
1960 - 1980

Place	1960	1970	1980	% Change 1960-1980
Baltimore City	355,576	344,801	296,270	-16.6
Anne Arundel County	78,860	121,742	179,290	127.4
Baltimore County	180,228	256,033	320,082	77.6
Carroll County	19,052	27,030	44,532	133.7
Harford County	29,756	46,343	66,559	123.7
Howard County	13,270	23,648	60,403	355.2
Metropolitan Area	676,742	819,597	967,136	43.0

Source: C.R. Goodman and J.M.Bailey, Commuting in the Baltimore Region: Historical Perspectives and Current Trends. Baltimore: Regional Planning Council, June 1985, p. 9.

Table 3-2

Employment at Place of Work
Baltimore Metropolitan Area
1964 - 1980

Place	1964[a]	1970[a]	1980[b]	% Change 1964-1980
Baltimore City	436,900	473,400	458,600	5.0
Anne Arundel County	83,900	134,200	146,700	74.9
Baltimore County	174,400	245,300	316,300	81.4
Carroll County	17,700	24,000	31,900	80.2
Harford County	34,900	47,100	45,200	29.5
Howard County	10,500	27,100	59,300	464.8
Metropolitan Area	758,300	951,400	1,058,000	39.5

[a] from C.R. Goodman and J.M. Bailey, Commuting in the Baltimore Region: Historical Perspectives and Current Trends. Baltimore: Regional Planning Council, June 1985, p. 12.

[b] from RPC Round II Socioeconomic Cooperative Forecast, July 1982.

(employed and unemployed) and employment were estimated to have increased by two percent and seven percent, respectively (Table 3-3). During the same period, Baltimore City's labor force declined from 360,000 to 340,000, a decrease of six percent. The number of jobs in Baltimore City declined from 458,600 to 424,400, a decrease of eight percent.

In the six suburban activity centers selected for study (RPDs 201, 202, 306, 309, 314, 315, 317, 605, 606, and 607) the labor force increased from 128,650 to 146,180 between 1980 and 1985, an increase of 14 percent. Employment increased 25 percent from 171,550 to 214,370. The activity centers contributed to 81 percent of the metropolitan area's labor force growth and 55 percent of the metropolitan area's employment growth between 1980 and 1985.

It is clear that the suburban counties in general and the activity centers in particular played a monumental role in the economic growth of the metropolitan area. Baltimore City's role continued to decline relatively and absolutely.

Suburban Activity Centers

All of the selected activity centers in the metropolitan area are major nodes of industrial, commercial, and residential growth (Map 3-1). They have been designated as planned growth areas that would receive the bulk of development in their respective counties. All except Towson are located outside the circumferential highway I-695, along major corridors radiating out from Baltimore City. These centers have had abundant

Table 3-3

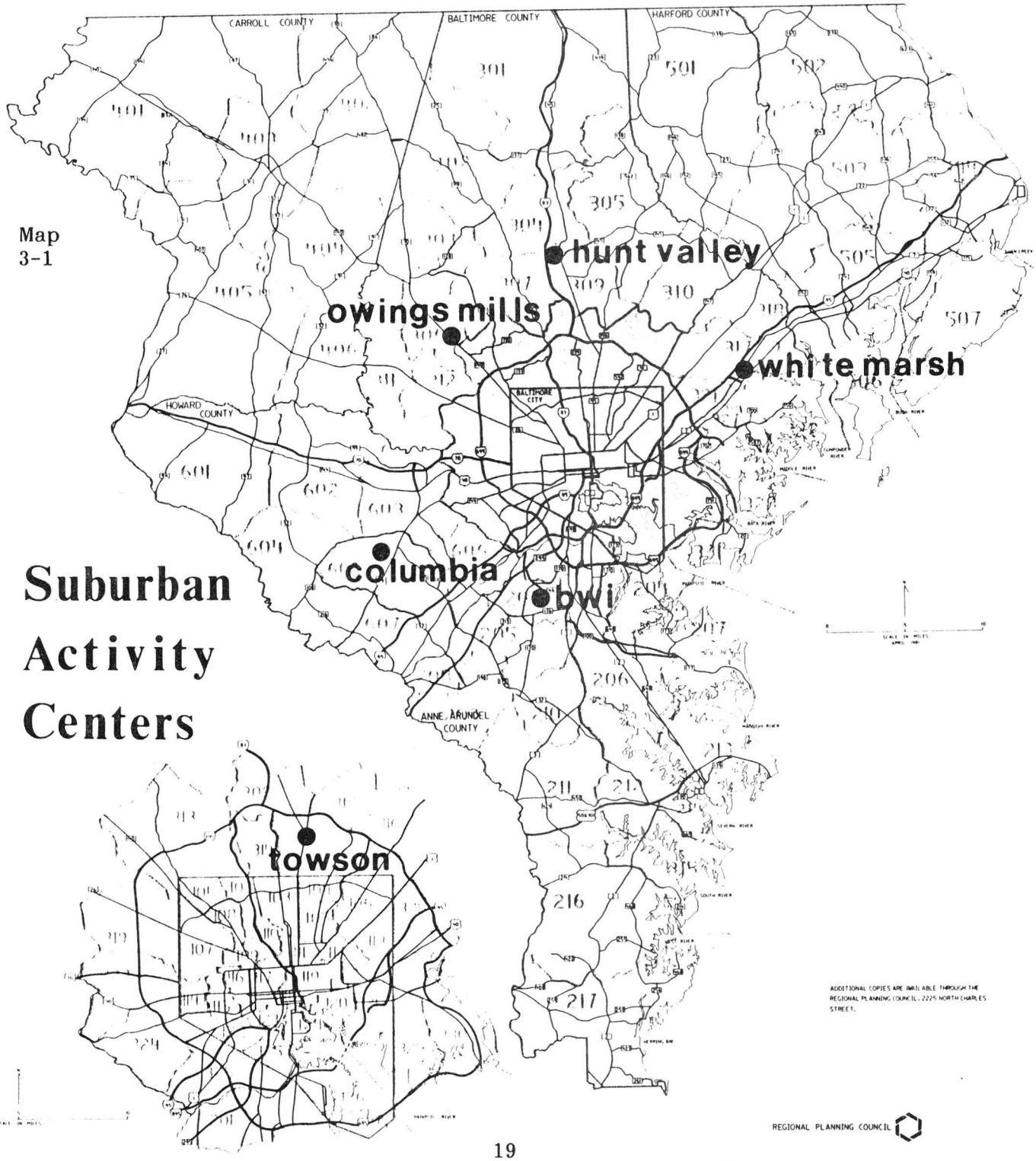
Labor Force and Employment
Baltimore Metropolitan Area
1980-1985

	Labor Force			Employment		
	1980[a]	1985[b]	% Change	1980[a]	1985[b]	% Change
Metropolitan Area	1,055,500	1,077,161	2.0	1,058,000	1,135,500	7.3
Suburban Activity Centers[c]	128,650	146,180	13.6	171,550	214,370	25.0
Baltimore City	360,000	340,000	-5.6	458,600	424,400	-7.5

[a] Calculated from RPC Round II Socioeconomic Cooperative Forecast, July 1982.

[b] Calculated from RPC Round III-A Socioeconomic Cooperative Forecast, February 1988.

[c] RPDs: 201, 202, 306, 309, 314, 315, 317, 605, 606, 607.



REGIONAL PLANNING DISTRICTS

MORE CITY

	UPPER PARK HEIGHTS		GARDENVILLE		CHERRY HILL		ODENTON		SPARKS		TOWSON		ROSEDALE		ELDERSBURG
	MOUNT WASHINGTON		TEN HILLS		BROOKLYN		CROFTON		JACKSONVILLE		PARKVILLE		MIDDLE RIVER	**HARFORD COUNTY**	
	ROLAND PARK		IRVINGTON	**ANNE ARUNDEL COUNTY**			EPPING FOREST		REISTERSTOWN-OWINGS MILLS		PERRY HALL-WHITE MARSH		ESSEX		JARRETTSVILLE-NORRISVILLE
	CHINQUAPIN		ROSEMONT		BROOKLYN HEIGHTS		BROADNECK		CHESTNUT RIDGE		KINGSVILLE		DUNDALK-TURNERS STATION		CARDIFF-DARLINGTON
	GOVANS NORTHWOOD		WEST BALTIMORE		FRIENDSHIP		ANNAPOLIS		LUTHERVILLE		LOCHEARN		NORTH POINT		BEL AIR-FALLSTON
	HAMILTON		METROCENTER		GLEN BURNIE		HILLSMERE		COCKEYSVILLE-TIMONIUM		OVERLEA		EDGEMERE		ABERDEEN-HAVRE DE GRACE
	FOREST PARK		EAST BALTIMORE		MARLEY NECK		DAVIDSONVILLE		FORK		ROSSVILLE	**CARROLL COUNTY**			EDGEWOOD-JOPPA
	LOWER PARK HEIGHTS		HIGHLANDTOWN		STEWART CORNER		DEALE		HARRISONVILLE		WINDLASS		TANEYTOWN		ARMY CHEMICAL CENTER
	DRUID HILL		CANTON		SEVERNA PARK	**BALTIMORE COUNTY**			RANDALLSTOWN		SECURITY		MANCHESTER		ABERDEEN PROVING GROUNDS
	HAMPDEN		MORRELL PARK		MOUNTAIN ROAD		HEREFORD-MARYLAND LINE		PIKESVILLE		CATONSVILLE		WESTMINSTER		
	WAVERLY		CARROLL PARK		MARYLAND CITY		PRETTYBOY		RUXTON		ARBUTUS-LANDSDOWNE		FINKSBURG		
	CLIFTON		SOUTH BALTIMORE		FORT MEADE		FOWBLESBURG						MOUNT AIRY		

HOWARD COUNTY

	COOKSVILLE
	WEST FRIENDSHIP
	ELLICOTT CITY
	CLARKSVILLE
	COLUMBIA
	ELKRIDGE
	LAUREL

developable land, which in a robust economy has contributed to rapid rates of growth.

BWI Airport is an area of industrial, R&D, and office parks and government complexes located in northern Anne Arundel County approximately 10 miles south of Baltimore and adjacent to the Baltimore Washington Parkway. The center's central node of development is Baltimore Washington International Airport, a rapidly growing hub airport for passenger and air cargo services. In 1985 the area had approximately 27,000 employees and by 1990 the area was expected to have 45,000 to 60,000 employees, according to the BWI Commuter Assistance Center, one of the nation's first transportation management associations (TMAs). The area has had an abundance of undeveloped land available for development.

Columbia/Route 1 is the area in eastern Howard County consisting of the planned new Town of Columbia and the Route 1 corridor between southern Baltimore County and Laurel in Prince Georges County. Columbia has been developed for high quality industrial, R&D, office, and retail activities as well as residential development for an eventual population of approximately 100,000 people. Columbia has a planned town center anchored by a large regional shopping mall. The Route 1 corridor is an historic roadway in eastern Howard County along which are concentrated industrial parks, warehousing/distribution operations, wholesaling, low- to moderate value residential development, and strip commercial development. The corridor once

suffered an economic decline from the construction and use of I-95, but it has experienced a rejuvenation because of its location between Baltimore and Washington, DC.

Hunt Valley, including the business park of Loveton, is located in north central Baltimore County. This area consists of industrial and office parks, surrounded by much single family residential development. The node around which this development has taken place is the Hunt Valley Mall, a regional shopping mall. The Hunt Valley/Loveton business centers contain nearly 20 percent of the total industrial space and a substantial share of the office space in Baltimore County. More than 25,000 employees work at these two centers.

Towson is an historic town located north of Baltimore City and just south of the circumferential highway, I-695. Towson is the center of government of Baltimore County. The residential population is approximately 67,000. The downtown is fairly typical with governmental, retailing, financial and other services, and educational activities. The area has a good supply of developable land, nearby residential development, and excellent road accessibility. Between 1982 and 1985 the area added 1.25 million square feet of commercial and light industrial space. During the same period, Towsontown Centre became a major regional shopping mall.

White Marsh and Owings Mills are two relatively new growth areas in northeast and northwest Baltimore County, respectively. Both areas are planned residential, commercial, and industrial

development areas, each having a "town center" anchored by a regional shopping mall. As a result of the county's efforts to channel new growth in these areas, both have been experiencing rapid growth.

Commuting Trends

The realignment of labor and jobs over the metropolitan area's geography and the concentration of development in suburban activity centers have fundamentally influenced commuting patterns. Between 1960 and 1980 the number of workers in the metropolitan area commuting from suburb-to-suburb increased by 145 percent, while the number commuting from suburb-to-city increased by 85 percent (Table 3-4). Commuter travel from city-to-suburb increased by 66 percent. City-to-city commuting decreased by 23 percent.

The contrast between city and suburban counties is also apparent from the differences in the choices of travel modes to work and vehicle ownership. The counties had similar distributions of driving alone, ride-sharing, and use of public transit in 1980 (Table 3-5). Baltimore City had a much higher percentage of public transit use (25.4%) and a significantly lower percentage of driving alone (44.4%) than the suburban counties (Goodman and Bailey, 1985). The percentage of households in the metropolitan area without a motor vehicle decreased from 28 percent to 19 percent between 1960 and 1980, while the percentage in Baltimore City held steady at approximately 40 percent.

Table 3-4

Metropolitan Area Commuting Patterns

	1960	1970	1980	% Change 1960-1980
City-to-City	286,650	231,200	221,200	-22.8
City-to-Suburb	42,900	78,400	71,300	66.2
Suburb-to-City	104,900	136,300	197,300	88.1
Suburb-to-Suburb	189,600	312,400	465,400	145.5
TOTALS	624,050	758,300	955,200	

Source: C.R. Goodman and J.M. Bailey, Commuting in the Baltimore Region: Historical Perspectives and Current Trends, Baltimore: Regional Planning Council, June 1985, p. 17.

Table 3-5

Percentage Distribution of Travel Modes, 1980
Baltimore Metropolitan Area

PLACE OF RESIDENCE	Drive Alone	Carpool/ Vanpool	Public Transit	Other	Total
Baltimore City	44.4	20.1	25.4	10.1	100
Anne Arundel County	66.0	22.8	1.5	9.7	100
Baltimore County	67.0	22.8	4.7	5.5	100
Carroll County	65.1	26.9	0.5	7.5	100
Harford County	64.8	24.9	1.5	8.8	100
Howard County	68.9	22.5	3.0	5.6	100
Baltimore Region	59.8	22.3	10.3	7.6	100

Source: C.R. Goodman and J.M. Bailey, Commuting in the Baltimore Region: Historical Perspectives and Current Trends, Baltimore: Regional Planning Council, June 1985, p. 33.

A study by the Institute for Urban Research at Morgan State University focussed on the characteristics of selected Baltimore City RPDs with low median household incomes (Mariam, 1988). The study found that as of 1980 many of these RPDs contained large proportions of black households that commuted to work by public transit (Table 3-6). Lower Park Heights (108), West Baltimore (117), and East Baltimore (119) had particularly large percentages of black households comprising the population (Map 3-2). Among black households commuting to work by motor vehicle or transit, 38 percent commuted by transit in Lower Park Heights, 54 percent in West Baltimore, and 53 percent in East Baltimore. Among the white households transit usage was generally lower but varied more among the RPDs. For example, 53 percent of white households commuted by transit in West Baltimore but only 24 percent commuted by transit in East Baltimore.

The study also found that the majority of black and white households in these low-income RPDs did not own vehicles in 1980. Fifty-six percent reported owning no vehicle and 35 percent reported owning one vehicle. Vehicle ownership rates were proportionally lower in West Baltimore, East Baltimore, and Lower Park Heights.

Among low-income households (less than $15,500) in all of the selected low-income RPDs, 53 percent of workers utilized public transit for commuting to work (Mariam, 1988). Also, there were 6,612 low-income workers, 24 percent of the total, reporting employment in seventeen communities outside Baltimore City. The

Table 3-6

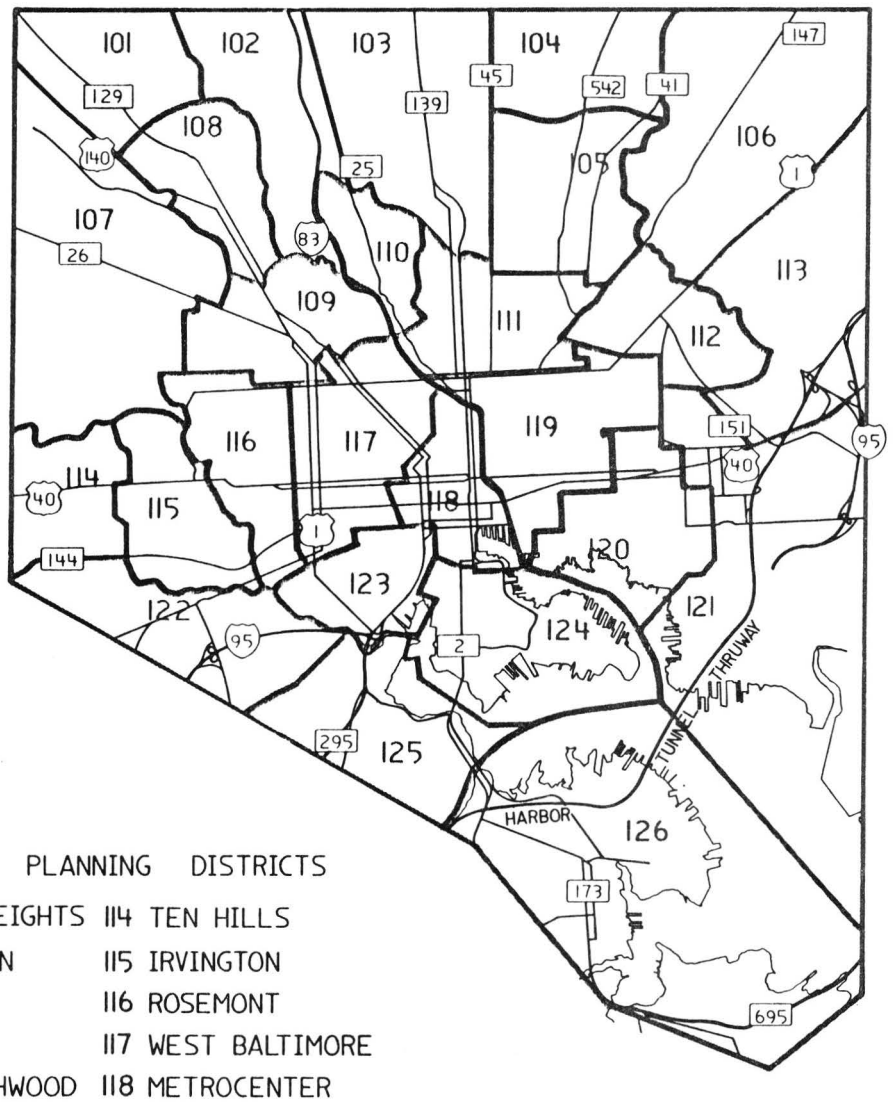
Distribution of Low-Income Households by Locality, Mode of Travel and Race
Baltimore Metropolitan Area

Locality	Race: Black		Race: White	
	Car Van Truck	Public Trspt.	Car Van Truck	Public Trspt.
Lower Park Hghts. B=13,158 W= 377	8,137	5,021	281	96
Druid Hill B=2,523 W= 22	1,411	1,112	16	6
West Baltimore B=16,009 W= 3,529	7,313	8,696	1,657	1,872
East Baltimore B=13,608 W= 2,173	6,358	7,250	1,667	506
Cherry Hill B=2,450 W= 155	1,915	535	54	101
Brooklyn B= 213 W=1,166	147	66	750	416

Source: A.G. Mariam, Urban Disinvestment and Inner City Poverty in Baltimore, Baltimore: Morgan State University, 1988, p. 14.

Map 3-2

BALTIMORE CITY



REGIONAL PLANNING DISTRICTS

101	UPPER PARK HEIGHTS	114	TEN HILLS
102	MT. WASHINGTON	115	IRVINGTON
103	ROLAND PARK	116	ROSEMONT
104	CHINQUAPIN	117	WEST BALTIMORE
105	GOVANS-NORTHWOOD	118	METROCENTER
106	HAMILTON	119	EAST BALTIMORE
107	FOREST PARK	120	HIGHLANDTOWN
108	LOWER PARK HEIGHTS	121	CANTON
109	DRUID HILL	122	MORRELL PARK
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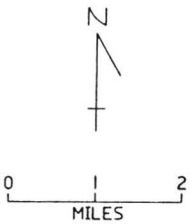
111	WAVERLY	124	SOUTH BALTIMORE
112	CLIFTON	125	CHERRY HILL
113	GARDENVILLE	126	BROOKLYN



RPC 1981

largest concentrations of these workers were in Towson (26%), Security (20%), Pikesville (14%), Arbutus-Lansdowne (8%), and Catonsville (8%). All of these communities are in Baltimore County and are adjacent to Baltimore City.

During the 1980s several changes occurred in the commuting patterns, choices of travel mode to work, and vehicle ownership, according to a BRCOG household travel survey conducted in 1988. Each jurisdiction in the metropolitan area had an increase in the percentage of internal commuter trips between 1980 and 1988; more trips originated and ended in the jurisdiction of residence. The percentage of commuter trips originating in Baltimore City and ending in other jurisdictions, for example, decreased from 30 percent to 24 percent of all commuter trips originating in the city.

The percentage of commuters in the metropolitan area driving alone increased from 60 percent to 74 percent between 1980 and 1988, while the percentage of commuters in car/vanpools decreased from 22 percent to only 10 percent (Table 3-7). According to a study by Morgan State University's Center for Transportation Studies, ride-sharers in the metropolitan area were overwhelmingly white, middle to upper-income professional employees (Ayele and Byun, 1984). It is ironic that the study also found that economic factors were the prime motivators to ride-share, but that low-income commuters tended not to participate in ride-sharing.

The BRCOG household survey data indicate that the percentage

Table 3-7

Mode Use by Place of Residence [in Percent]
Baltimore Metropolitan Area

Place of Residence	Drive Alone 1980	Drive Alone 1988	Car/Vanpool 1980	Car/Vanpool 1988	Public Trspt. 1980	Public Trspt. 1988	Other 1980	Other 1988
Anne Arundel County	66	81	23	13	1	2	10	4
Baltimore City	45	56	20	10	25	25	10	9
Baltimore County	67	83	23	8	5	4	5	5
Carroll County	65	81	27	11	1	1	7	7
Harford County	65	81	25	13	1	1	9	5
Howard County	69	81	22	12	3	3	6	4
Regional Average	60	74	22	10	10	10	8	6

Source: RPC Household Travel Survey, 1988 (unpublished), and C.R. Goodman and J.M. Bailey, Commuting in the Baltimore Region: Historical Perspectives and Current Trends, Baltimore: Regional Planning Council, June 1985.

of people in the metropolitan area without a vehicle decreased from 19 percent to 10 percent between 1980 and 1988, while the percentage of public transit use remained approximately the same. However, data from the Maryland Mass Transit Administration indicate that transit ridership entering the Baltimore CBD dipped dramatically in the early 1980s and only recently approached the level of ridership in 1980 (Harrold, 1989).

In Baltimore City the percentage driving alone increased from 45 percent to 56 percent between 1980 and 1988, while the percentage using car/vanpools decreased from 20 percent to 10 percent. Apparently, the abundance of relatively inexpensive fuels during the 1980s has reduced the incentive for commuters to share rides. Baltimore City had the largest decrease in the percentage of people without a vehicle from 38 percent to 18 percent, while transit use held steady at 25 percent (Table 3-8).

The comparison of data from the 1980s to data from past decades reveals a continuation of some past trends and some dramatic changes in travel behavior over a relatively short period of time. Between 1960 and 1980 the employment base in Baltimore city declined. Suburb-to-suburb and city-to-suburb commuting to work increased. Among low-income households in the city, predominantly black households, vehicle ownership rates were low and, consequently, transit dependence was high. A small but significant proportion of low-income households commuted to work in other jurisdictions.

Between 1980 and 1988 the suburban counties attracted

Table 3-8

Vehicle Availability by Place [in Percent]
Baltimore Metropolitan Area

Vehicles Available	Baltimore City		Anne Arundel County		Baltimore County		Carroll County		Harford County		Howard County		Percent of Region	
	1980	1988	1980	1988	1980	1988	1980	1988	1980	1988	1980	1988	1980	1988
0	38	18	5	3	7	4	5	2	6	1	3	1	18	10
1	39	40	31	16	37	22	25	15	29	20	29	17	35	31
2	18	31	43	50	40	47	44	51	43	51	47	51	33	39
3	5	11	21	31	16	27	26	32	22	28	21	31	14	20
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: RPC Household Travel Survey, 1988 (unpublished), and C.R. Goodman and J.M. Bailey, Commuting in the Baltimore Region: Historical Perspectives and Current Trends, Baltimore: Regional Planning Council, June 1985.

relatively fewer commuter trips by Baltimore City residents, despite a city employment base that continued to erode. In the city as well as the metropolitan area as a whole, vehicle ownership rates and driving alone increased dramatically over the same period. Ride-sharing lost its significant share of work-trips, while transit had difficulty maintaining its share of work-trips in the face of increased vehicle ownership.

The profound changes in commuting during the 1980s do not bode well for reducing congestion, conserving energy, and increasing mobility of low-skilled, inner-city labor. Because of overall changes in demand for travel to work, it may become increasingly difficult to expand cost-effective transit, promote ride-sharing, and further transportation demand management. Increasing demand for road space by single-occupant automobiles for suburb-to-suburb commuting and increasing supply of transit in attempts to discourage automobile use may severely constrain public resources that could be used for reverse commute services.

CHAPTER 4

ACTIVITY CENTER JOB ACCESSIBILITY

Accessibility Analysis

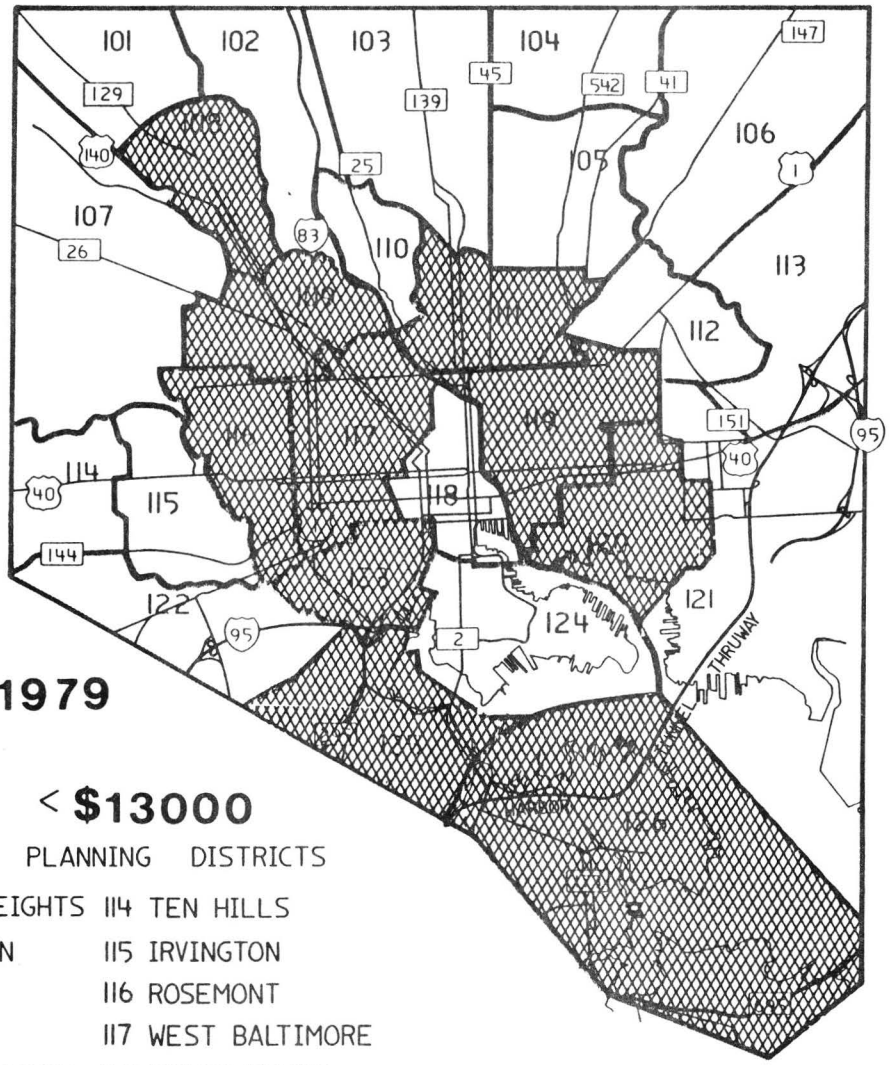
The first step in the accessibility analysis was to develop a spatial socioeconomic profile of Baltimore City. Household income data on the RPD level, compiled by BRCOG from the 1980 Census of Population, were used to identify the low-income areas of the city. By subjecting median household income data by RPD to a cluster analysis, the RPDs were grouped into income categories. City RPDs with median household incomes for 1979 less than $13,000 were mapped. The resulting patterns show that low-income households were concentrated in inner-city areas adjacent to Metrocenter and South Baltimore, essentially the current and historic CBD (Map 4-1). The outer rim of RPDs within the city, except for Cherry Hill (125) and Brooklyn (126), have been the traditional middle and upper-income areas of the city.

Change in at-place employment by RPD between 1980 and 1985 was also subjected to a cluster analysis. The RPDs that experienced a greater than 10 percent decrease were mapped in an attempt to illustrate a spatial association between low household income and employment loss (Map 4-2). The employment data came from BRCOG's cooperative socioeconomic forecasts. The pattern of employment loss is more scattered than that of low-income. Employment loss was concentrated in northeastern, eastern, southern, and western Baltimore City.

It is apparent that RPDs that experienced the greatest

Household Income
BALTIMORE CITY

Map 4-1

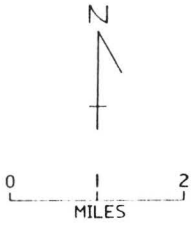


Median Income 1979

< $13000

REGIONAL PLANNING DISTRICTS

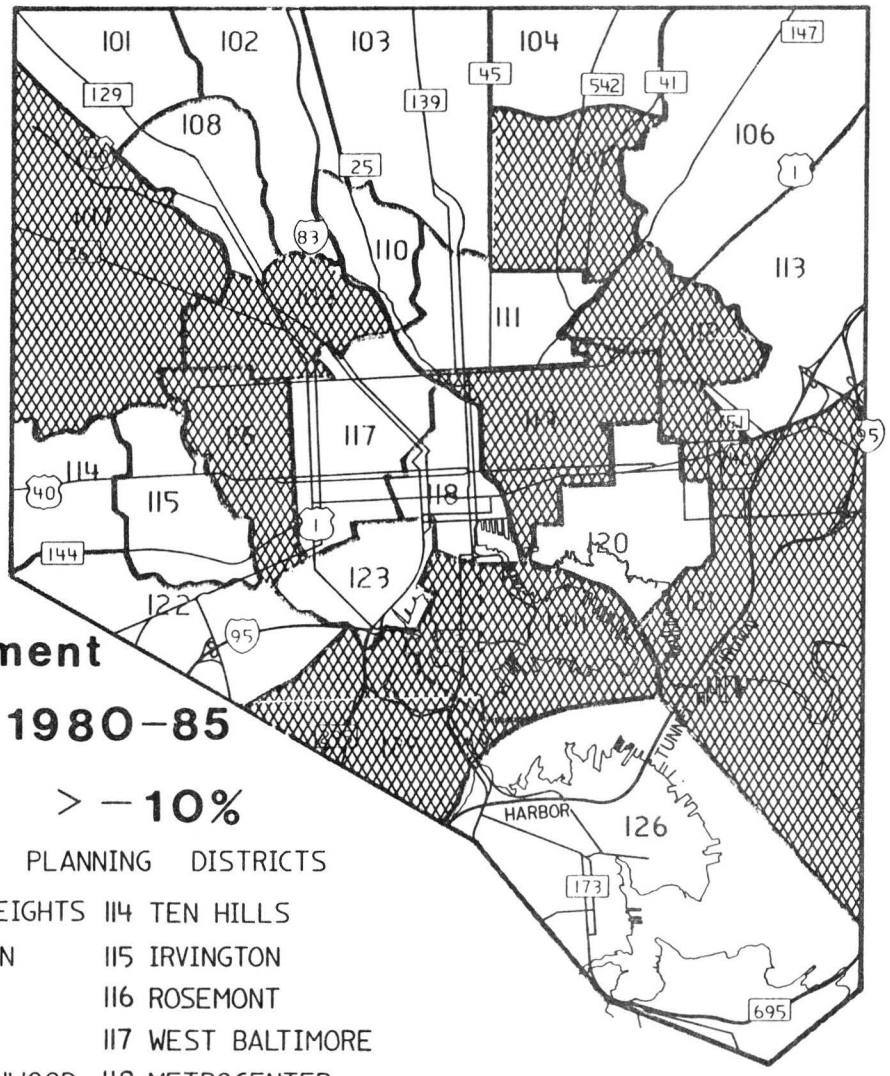
101	UPPER PARK HEIGHTS	114	TEN HILLS
102	MT. WASHINGTON	115	IRVINGTON
103	ROLAND PARK	116	ROSEMONT
104	CHINQUAPIN	117	WEST BALTIMORE
105	GOVANS-NORTHWOOD	118	METROCENTER
106	HAMILTON	119	EAST BALTIMORE
107	FOREST PARK	120	HIGHLANDTOWN
108	LOWER PARK HEIGHTS	121	CANTON
109	DRUID HILL	122	MORRELL PARK
110	HAMPDEN	123	CARROLL PARK
111	WAVERLY	124	SOUTH BALTIMORE
112	CLIFTON	125	CHERRY HILL
113	GARDENVILLE	126	BROOKLYN



RPC 1981

Employment Loss
BALTIMORE CITY

Map 4-2



Employment Change 1980–85

> −10%

REGIONAL PLANNING DISTRICTS

101	UPPER PARK HEIGHTS	114	TEN HILLS
102	MT. WASHINGTON	115	IRVINGTON
103	ROLAND PARK	116	ROSEMONT
104	CHINQUAPIN	117	WEST BALTIMORE
105	GOVANS-NORTHWOOD	118	METROCENTER
106	HAMILTON	119	EAST BALTIMORE
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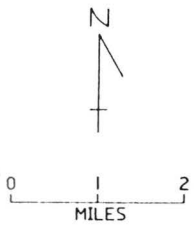


RPC 1981

employment loss are either low-income RPDs or are adjacent to low-income RPDs. Druid Hill (109), Rosemont (116), East Baltimore (119), and Cherry Hill (125) are RPDs that exhibited low household income as well as large employment losses.

The next step of the analysis attempted to show that there is spatial variation within the city in terms of accessibility to suburban activity centers by automobile and transit. The ultimate intent of the analysis was to identify a spatial association between relative inaccessibility to suburban employment and low household income.

Constrained or peak-hour automobile travel time data for 1980 and simulated unconstrained transit travel time data for 1985 were available from BRCOG and were used to calculate a measure of modal inaccessibility to all suburban activity center RPDs from each city RPD. More recent peak-hour travel times were not available at the time of analysis. Thus, a measure of relative inaccessibility to individual activity centers through time could not be calculated. The simulated transit times represented unconstrained or free-flow running times only. No waiting, walking, or transfer times were included, which vary significantly by time of day and of course add greatly to the total travel time by transit.

The total travel times from each city RPD to all of the suburban activity center RPDs were used as a measure of relative inaccessibility from areas within the city. The measure is calculated using the following formula:

$$Ai = \sum_{j=1}^{n} TTij$$

where Ai = relative accessibility from city RPDi to all suburban RPDj's

TTij = travel time between RPDi and RPDj

i = (1,...,n) and j = (1,...,n)

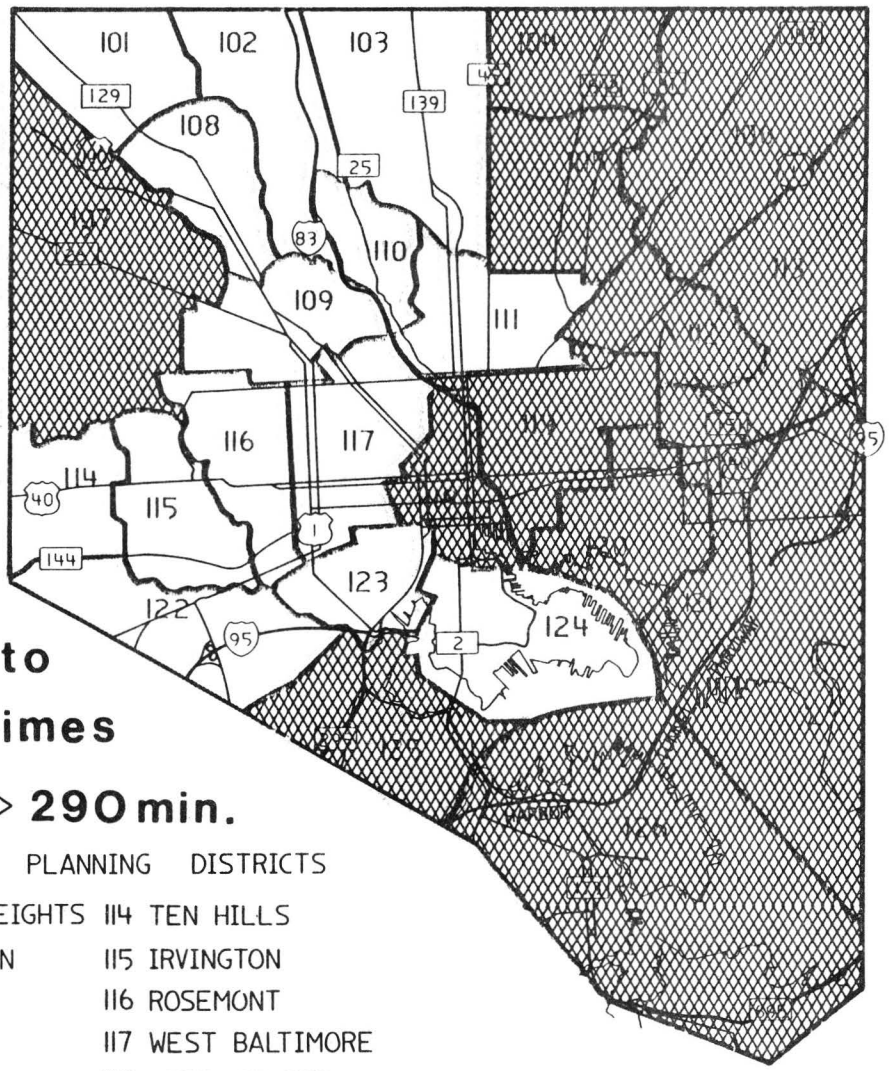
Those RPDs in a distinct cluster of greatest total travel time to all suburban activity center RPDs were then mapped to show the spatial patterns of inaccessibility.

The areas of relative inaccessibility by automobile within the city are in northeast, Metrocenter (118), south, and east Baltimore (Map 4-3). This pattern is influenced by the location of the activity centers, located primarily north and southwest of the city. The relatively inaccessible areas within the city are clearly more distant from these activity centers.

The areas of relative inaccessibility by transit are also in northeast and east Baltimore for the same reason as for automobile travel, that is, distance from activity centers (Map 4-4). Metrocenter (118) is not an area of transit inaccessibility, since transit historically has a radial orientation to and from the CBD. The CBD and immediate environs usually have the most transit service beginning and ending there of any other area in a city. The southwestern tier of RPDs is a significant area of relative inaccessibility because of the long distances from the northern activity centers and because of the absence of transit links to the Columbia/Route 1 activity center in 1985. While express bus service has since been established

Inaccessibility to Suburban Centers
BALTIMORE CITY

Map 4-3



1980 Auto Travel Times

▨ > 290 min.

REGIONAL PLANNING DISTRICTS

101	UPPER PARK HEIGHTS	114	TEN HILLS
102	MT. WASHINGTON	115	IRVINGTON
103	ROLAND PARK	116	ROSEMONT
104	CHINQUAPIN	117	WEST BALTIMORE
105	GOVANS-NORTHWOOD	118	METROCENTER
106	HAMILTON	119	EAST BALTIMORE
107	FOREST PARK	120	HIGHLANDTOWN.
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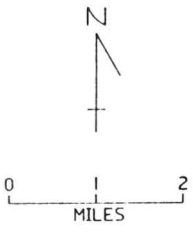
110	HAMPDEN	123	CARROLL PARK
111	WAVERLY	124	SOUTH BALTIMORE
112	CLIFTON	125	CHERRY HILL
113	GARDENVILLE	126	BROOKLYN

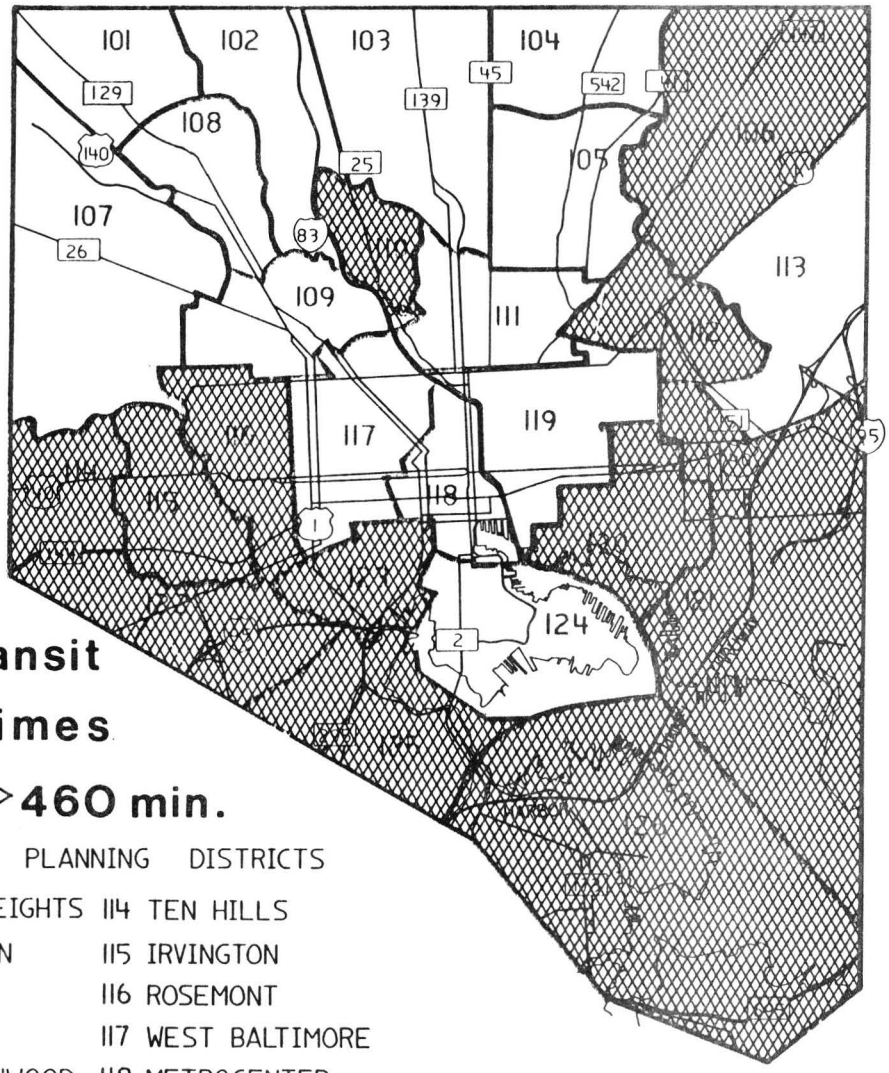


RPC 1981

Inaccessibility to Suburban Centers

BALTIMORE CITY

Map 4-4



1985 Transit Travel Times

▨ >460 min.

REGIONAL PLANNING DISTRICTS

101	UPPER PARK HEIGHTS	114	TEN HILLS
102	MT. WASHINGTON	115	IRVINGTON
103	ROLAND PARK	116	ROSEMONT
104	CHINQUAPIN	117	WEST BALTIMORE
105	GOVANS-NORTHWOOD	118	METROCENTER
106	HAMILTON	119	EAST BALTIMORE
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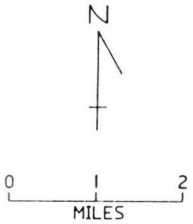


RPC 1981

between the Baltimore CBD and Columbia/Route 1, it is doubtful that the accessibility from southwest Baltimore to those activity centers has improved dramatically. The outlier, Hamden (110), is apparently far enough from the CBD and from the northern activity centers that it appears within the cluster of relative inaccessibility.

One should note that several of the RPDs that are relatively inaccessible by automobile or transit are also low-income RPDs as well. Rosemont (116), East Baltimore (119), Highlandtown (120), Carroll Park (123), Cherry Hill (125), and Brooklyn (126) appear on the low household income map and on either the automobile or transit inaccessibility map.

Simple correlations of inaccessibility (travel time) by transit and automobile with employment loss yielded coefficients of -.82 and -.86, respectively. A correlation between median household income and employment loss yielded a coefficient of .84. These results do not imply causal relationships among low-income, employment loss, and inaccessibility, but the strong spatial associations are nonetheless significant for area description purposes and setting the stage for more in-depth analysis in Chapter 5.

The third step in the accessibility analysis was to determine whether reverse commute transit times have been greater than suburb-to-city transit times. Unconstrained transit travel times for 1985 and unconstrained automobile travel times for 1986 were available from BRCOG. For selected pairs of city and

suburban RPDs, average travel times by transit and automobile and ratios of transit to automobile travel times in both directions were calculated (Table 4-1). The selected RPDs consisted of six city RPDs and three suburban activity center RPDs that had substantial amounts of employment and labor force. The city RPDs were also characterized by low median household income and relative inaccessibility. The travel time ratios were then compared to discern differences between suburb-to-city and city-to-suburb transit travel times.

It is apparent from the table that transit travel times (running times only) were approximately three times the duration of automobile times and that city-to-suburb transit to automobile travel time differentials were generally greater than suburb-to-city time differentials.

The first implication from the foregoing analyses is that low-wage residents of relatively inaccessible areas of the city are faced with longer travel times in the commute to suburban activity centers than other city residents. The second implication is that transit-dependent residents of inaccessible areas are also faced with longer travel times for the reverse commute than suburbanites commuting to the city by automobile or transit. Travel to work generally occurs during a more constrained time period than the trip home. Arriving to work on time is a critical factor in retaining a job, particularly for low-wage jobs. Many low-wage jobs have nighttime shifts when transit is less available. Thus, longer times for the reverse

Table 4-1
Unconstrained Travel Times Between Selected City and Suburban RPDs

Baltimore Metropolitan Area
(minutes)

O / D		1985 Transit Time	1986 Auto Time	Transit Time: City-to-Sub.	Auto Time Sub.-to-City
116	202	88	19	4.63	4.45
202	116	89	20		
116	309	91	25	3.64	2.80
309	116	70	25		
116	315	73	24	3.04	3.22
315	116	74	23		
119	202	83	21	3.95	3.67
202	119	77	21		
119	309	82	24	3.42	2.54
309	119	61	24		
119	315	62	22	2.82	2.77
315	119	61	22		
120	202	84	22	3.82	3.63
202	120	80	22		
120	309	89	27	3.30	2.85
309	120	74	26		
120	315	72	23	3.13	3.04
315	120	73	24		
123	202	80	17	4.70	4.82
202	123	82	17		
123	309	89	26	3.42	2.62
309	123	68	26		
123	315	76	24	3.17	3.17
315	123	76	24		
125	202	61	19	3.21	3.33
202	125	60	18		
125	309	98	32	3.06	2.55
309	125	79	31		
125	315	81	30	2.70	2.79
315	125	81	29		
126	202	67	21	3.19	3.29
202	126	69	21		
126	309	109	35	3.11	2.66
309	126	93	35		
125	315	91	31	2.94	3.03
315	126	97	32		
Total		2840	882	61.25	57.23
City/Sub. Avg.		82	23		
Sub./City Avg.		76	24		

commute to work are an undue burden on the transit-dependent, low-wage, unemployed residents of the relatively inaccessible areas.

Employer Surveys

The employer surveys provide greater insight into the accessibility and commuting problems of employees at suburban activity centers. The surveys were conducted either by BRCOG or by a cooperating group at four of the six selected activity centers. Owings Mills and White Marsh, where employer surveys were not conducted, have had relatively modest levels of commercial and residential development. However, they are expected to undergo rapid and extensive growth and they may be surveyed in a similar manner to the other activity centers in the future.

BWI Airport

The BWI Airport center is a widespread area of industrial and office parks and government complexes surrounding a major air port. The largest employers in the area are defense contractors, transportation firms, government agencies, and several hotels. The majority of employees are thus in highly skilled technical and administrative jobs. A significant number of semi-skilled or unskilled jobs exist in the hotel and office support services industries. Ground transportation in the area, as is typical around major airports, has become congested during certain hours.

In 1985 an employer survey was conducted by the precursor of the BWI Commuter Assistance Center. The survey concentrated on

the transportation needs of employees and employer willingness to participate in efforts to improve transportation. The survey was sent to 251 employers in the area and 41.4 percent responded. Sixty-four percent of the respondents identified peak-hour traffic congestion as the most important commuter-related transportation problem in the area. A greater percentage of respondents, 70 percent, identified traffic congestion as the most important problem in the future. Only 10 percent of the respondents identified inadequate access by public transportation as a problem, since the overwhelming majority of employees commute to work by automobile. There was a wide variety of responses regarding actions that employers would consider to improve the transportation situation, including encouraging car/vanpooling, participating in highway needs evaluations, and assisting in planning transportation improvements. When asked which area needed more transit service to and from BWI the most often selected area was Baltimore City.

The employees commute overwhelmingly by automobile from the southern portion of the metropolitan area: from all over Anne Arundel, eastern Howard, southern Baltimore, southern Carroll, and southern Harford counties and southwestern Baltimore City. A significant number of employees commute from the Washington Metropolitan Area as well.

The area has been served by MTA Routes 16 and 230. The BWI Commuter Assistance Center, since its inception, has lobbied MTA for additional and more frequent transit service to the area and

its efforts have been largely successful.

Columbia/Route 1

Columbia and the Route 1 corridor in Howard County have developed quite differently and the mixes of economic activities and types of jobs differ as well. In the Route 1 corridor labor is primarily employed in "blue collar" industrial, clerical, and retailing jobs. In Columbia labor is employed primarily in professional, technical, managerial, and clerical positions. Both areas have undergone substantial growth and have become major traffic generators, but public transportation services have been modest.

The Howard County Transportation Needs Survey was a joint effort of the Howard County Government, the MTA, and BRCOG. The survey was administered on August 11, 1987 by mail to 435 employers in Columbia and along the Route 1 corridor. A second mailing, including follow-up phone calls, was sent to non-respondents on September 11, 1987. Of the original 435 employers contacted, 203 returned their surveys for a response rate of 47 percent. This response represented 22,370 employees, 15,377 in Columbia and 6,993 in the Route 1 corridor.

The survey asked questions regarding the transportation constraints and needs facing employees commuting to Howard County for employment. Most of the employers surveyed recognized that their employees are experiencing difficulties commuting to and from work. Employers noted that the most frequent transportation problems experienced by their employees are peak hour congestion

and inadequate public transportation. Traffic congestion was ranked as the first or second most important problem by 54 percent of employers in the Route 1 corridor and by 56 percent of employers in Columbia. Inadequate public transportation was ranked first or second by 51 percent of employers in the Route 1 Corridor and by 39 percent of the businesses in Columbia. A large number of employers blamed inadequate public transportation for many of their unfilled vacancies. Employers from both study areas expressed the need for commuter bus service from Baltimore City. Along the Route 1 corridor 54 percent of employers responded that there was a need for service. Thirty-six percent from Columbia expressed a need for such service.

The labor force that commutes to the Route 1 corridor is drawn primarily from the immediate vicinity, from Baltimore and Anne Arundel counties and to a lesser extent adjacent portions of Howard and Prince George's counties. There is a noticeable drop in the numbers of employees that commute from Baltimore City. The commuting pattern in general indicates that there is a dramatic decline in commuting with increasing distance.

Labor employed in Columbia is drawn extensively from Montgomery, Howard, Prince Georges, and Carroll Counties. Commuting to Columbia does not decline nearly as precipitously with distance as it does to the Route 1 corridor.

Columbia has been served by MTA Routes 310 and 311, service provided under contract by Eyre Transportation, but these routes are aligned primarily to collect commuters in the Columbia area

and distribute them in the Baltimore CBD and State Office Center. Service from the Baltimore CBD to Columbia is limited to two trips in the morning with the same frequency for return in the evenings. Service from Baltimore to the Route 1 corridor is currently under study.

Hunt Valley

The Hunt Valley/Loveton business centers employ more than 25,000 employees. Most of the employees are in highly skilled technical and managerial positions. However, many of the employees are unskilled personnel who have difficulty getting to work. Both centers are located on a major north-south traffic corridor and the area is becoming rapidly more congested.

BRCOG and the Baltimore County Office of Planning and Zoning conducted a survey of the Hunt Valley/Loveton business centers in late 1986. Employers representing nearly 8,000 Hunt Valley/Loveton area employees responded to the survey. Traffic congestion and lack of adequate transit service were identified as the key transportation problems on 85 percent of the returned survey forms. The respondents believed that additional transit could provide alternative means of transportation for many of the lower-wage workers living in the metropolitan area. Increased accessibility or the need for additional highway and intersection capacity as well as transit was identified by 65 percent of the respondents as a major transportation problem. According to the respondents, employees commute primarily by automobile from all over the Baltimore Metropolitan Area as well as from the rest of

Maryland, Pennsylvania, the District of Columbia, and Virginia.

Hunt Valley had been served by MTA prior to the conduct of the survey. The 8B and 9 routes from Baltimore City enter the Hunt Valley complex on Shawan Road from York Road, circulate on McCormick Road and on to Hunt Valley Mall. There is a problem of traffic circulation through and around the complex. Baltimore County and MDOT have planned roadway improvements over the next few years. The Loveton Center does not have transit service. With sufficient patronage the MTA may extend service from the Hunt Valley area.

The Central Corridor Light Rail line is planned to terminate at Hunt Valley, when it is constructed. This line would provide direct service to the Baltimore CBD. The line would require some new rights-of-way near the business center and for the extension to Hunt Valley Mall.

Towson

Towson is a long established city with intense institutional, commercial, and residential development. In 1985 the daytime work force was estimated to be approximately 60,000. The area has a good supply of developable land, nearby residential development, and good accessibility via Interstate Highway and surface streets and public transit.

A transportation needs assessment was conducted by BRCOG in cooperation with the Towson Transit Management Association, a TMA. The purpose of the assessment was to elicit through interviews with focus groups the perceptions on local

transportation problems and solutions. The groups consisted of employers, developers, merchants, residents, and employees of government institutions. Over 40 individual interviews were held during the summer of 1985.

The employers were satisfied with the transportation situation and advocated no solutions. Most of the employers provided free parking to their employees and none made any special efforts to promote ride sharing. According to the employer group, transit was not a significant choice for commuting by area employees and little interest was expressed in shuttle services from outlying locations into Towson town center. Employers did perceive parking as a problem of increasing magnitude. Scarce on-site parking and the inconvenience of parking in public parking garages were cited as deterrents to attracting high-level managers and staff to the area.

From interviews with the other groups it was apparent that many employees do depend on mass transit. Employees of Towson State University, St. Joseph Hospital and area hotels and convention facilities particularly depend on transit from Baltimore City. With continued growth of employment in these sectors the other groups anticipated that additional commuter services would be needed.

The Towson area has been well served by MTA. Routes 8, 8B, 8D, 8E, and 9 link Towson to the Baltimore CBD, while Route 110 connects Towson to the Dundalk area. Since 1985, the Towson Transit Management Association has developed and promoted a

shuttle bus service to improve employee commuting in the area.

Baltimore County projects that the Towson area will experience an increase of 2.5 million square feet of office and retail space between 1985 and 1995. While the traffic situation has been described as relatively uncongested, this level of growth is expected to change that characterization.

Each of the employer surveys identified accessibility problems as among the most serious at their respective centers. The automobile is the predominant means of commuting by employees, so congestion was a present or future concern to employers. All of the centers were served by mass transit prior to conduct of the employer surveys. Yet, the surveys were consistent in identifying the need for additional public transportation services to facilitate commuting by employees, particularly low-level employees.

CHAPTER 5

ANALYSIS OF COMMUTING BY THE LOW-WAGE UNEMPLOYED

Survey Description

The survey of low-wage unemployed residents in Baltimore City was conducted from early January to late February 1989. At least 500 responses were sought to provide insight into previous job commuting behavior of unemployed, low-wage labor. Because of the relatively small number of unemployed residents of Baltimore City (approximately 6% of the labor force) and because of resource and time constraints a survey of a stratified random sample of low-wage, unemployed labor was thought to be impractical. The questionnaires were administered to unemployed workers who applied for unemployment insurance through the Maryland Office of Unemployment Insurance or applied for job training and placement assistance through the Baltimore City Office of Employment Development. The results of the survey should therefore not be considered as representative of all low-wage, unemployed labor in Baltimore City. However, the results do provide valuable insight into the commuting behavior and problems of a substantial number of low-wage, unemployed workers.

The questionnaires were distributed by the study team at three locations of the State Office of Unemployment Insurance and by city employees at seven locations of the City Office of Employment Development. The unemployment insurance offices were the Baltimore Local Office on North Eutaw Street, the Northwest Local Office on Mortimer Avenue, and the East Point Local Office

on Eastern Avenue. Most of the state office questionnaires were distributed at the Baltimore Local Office because of its high volume of applicants for unemployment insurance. Study team members gave out the questionnaires and assisted applicants in filling them out when requested. The seven locations of the City Office of Employment Development were: Mondawmin, Pimlico, Cherry Hill, MSC East, Govans, Highlandtown, and Southwest. The case managers at these locations assisted applicants in filling out the questionnaires, when time was available.

When the questionnaires were returned, those respondents who stated on the questionnaire that they earned more than $20,000 per annum were excluded from the sample, since the study objective was to analyze the conditions and perceptions of low-wage labor. The completed questionnaires totalled 528 and 58 percent of these came from the Office of Employment Development, while the remainder came from the Office of Unemployment Insurance. The data were coded on data sheets and input into the mainframe computer system at Morgan State University for analysis of frequency distributions, factor analysis, and step-wise multiple regressions by the SPSS statistical package.

Survey Results

A substantial portion of the questionnaire was devoted to demographic characteristics of the respondents (see Appendix A). The majority of respondents were in the age cohort of 25 to 39 years of age (Table 5-1). Relatively few were less than 18 years of age or greater than 54 years of age. The majority of

Table 5-1

Demographic Characteristics of Survey Respondents
Baltimore City 1989

Age	Frequency	Percent
< 18 years	13	2.5
18-24	117	22.2
25-39	291	55.1
40-54	72	13.6
> 54	14	2.7
No Response	21	3.9
Total	528	100.0

Sex	Frequency	Percent
Male	228	43.3
Female	268	50.8
No Response	32	5.9
Total	528	100.0

Race	Frequency	Percent
Black	362	68.6
White	85	16.1
Hispanic	1	0.2
Other	10	1.9
No Response	70	13.2
Total	528	100.0

Education	Frequency	Percent
Some High School	125	23.7
High School Graduate	227	43.0
Some College	121	22.9
College Graduate	29	5.5
No Response	26	4.9
Total	528	100.0

respondents were female, 51 percent, while 43 percent were male, the rest did not respond to the question. The overwhelming majority of respondents, 69 percent, were black. Whites constituted only 16 percent. The median size of the immediate family was 2.5 members.

Almost 72 percent of the respondents reported being at least high school graduates. Fifty-three percent of respondents reported special skills: technical, administrative, mechanical or other. The respondents' occupations were categorized as follows: 19.3 percent in secretarial/clerical jobs, 35.6 percent in sales/services, and 44.7 percent in construction/general labor/mechanical.

It is clearly not correct that the overwhelmingly non-white respondents are generally unskilled. The majority of respondents have at least a high school education and some special skills. This finding lends some support to Wickham's contention that it is unreasonable to conclude that blacks in the city are without work because their skills or attitudes are not attractive to employers (Wickham, 1987)(Szanton, 1986). Wickham further contends that employment bias against blacks is a more likely explanation for high levels of black unemployment.

The respondents reported hourly wages, when they were last employed, ranging from $2.00 per hour to $11.20 per hour; only a relative handful made less than $3.35 per hour. Since the study team often had to translate yearly or weekly salaries into hourly wages, the wages below the legal minimum are probably erroneous.

The median wage for the respondents was $6.00 per hour. Only 29 percent of the respondents reported owning at least one automobile, while the remainder, 71 percent, had no automobile.

The respondents reported residences by zip code primarily in four concentrations within the city. The most often reported residential area, 34 percent of respondents, was in Druid Hill, Rosemont, West Baltimore. Other lesser groupings were: Upper Park Heights, Lower Park Heights; Govans, Waverly, Clifton, East Baltimore; and Ten Hills, Irvington, Morrell Park.

Unfortunately, over 58 percent of respondents did not or could not report the zip code where they last worked. Approximately seven percent selected zip codes that were quite distant from Baltimore City or were erroneous. The remaining respondents reported working in the city (29.9%), primarily Metrocenter, or just outside the city (5.0%).

It has been reported in the literature that commuters often do not accurately report distances travelled, particularly when traveling by other than private automobile. Realizing that there may be some inaccuracy, the study team asked the question never-the-less. Over half of the respondents reported travelling less than 10 miles, while 25.3 percent did not respond to this question (Table 5-2). The remainder travelled more than 10 miles. Travel time is usually more accurately reported and the travel time for all modes ranged from one minute to 1.5 hours. The modal and median travel time was approximately 30 minutes, however. Those respondents commuting by public transportation

Table 5-2

Survey Respondents' Distance, Travel Time and Fare in Commute to Previous Job
Baltimore City 1989

Distance (Miles)	Number	Percent
0-10	284	53.8
11-20	61	11.6
⩾21	49	9.3
No Response	134	25.3
Total	528	100.0

Travel Time (Minutes)	Number	Percent
0-9	30	5.7
10-19	96	18.2
20-29	96	18.2
30-39	94	17.8
40-49	66	12.5
50-59	6	1.1
⩾60	75	14.2
No Response	65	12.3
Total	528	100.0

Fare ($)	Number	Percent
.20-.80	9	1.7
.90-1.20	169	32.0
1.25-1.85	35	6.6
2.00-2.50	30	5.7
2.80-3.45	21	4.0
⩾3.50	97	18.4
No Response or Not Applicable	167	31.6
Total	528	100.0

that paid a fare reported fares ranging from 20 cents per trip to $10.00 per trip. The median fare was approximately $1.25.

Because of the low rate of automobile ownership among the respondents one would expect the predominant use of public transportation (transit and paratransit) for commuting to work. Only 19 percent of respondents commuted to work exclusively by automobile and 25 percent of respondents commuted exclusively by bus (Table 5-3). Exclusive carpool use was 2.3 percent. Exclusive use of subway, vanpool, taxi, or illegal hack was one percent or less. Bus in combination with subway (transit) was used by 10 percent of respondents. Another six percent took the automobile in combination with transit. A combination of taxi and transit was used by 4.5 percent of respondents, while another 3.2 percent took taxi, transit, and hack. Almost two percent took a combination of hack and transit to commute to work. It should be noted that commuters did not necessarily use all of these modes for each trip, but could have used them alternatively over time. Over eight percent used other means to commute to work, e.g., walking, bicycling. About 12 percent of the respondents were distributed among various other mode permutations, and approximately 2 percent did not respond to the question.

In summary approximately 19 percent of respondents took the automobile exclusively, 10 percent took automobile in combination with transit and/or paratransit, 24 percent took some combination of transit and/or paratransit modes, and 35 percent took transit

Table 5-3

Survey Respondents' Mode Choices for Commuting When Employed
Baltimore City 1989

Mode(s)	Frequency	Percent
Bus only	131	24.8
Auto only	100	18.9
Transit/other	52	9.8
Other (bicycle, walking)	43	8.1
Auto/transit	32	6.1
Taxi/transit	24	4.5
Carpool/transit	21	4.0
Taxi/transit/hack	17	3.2
Carpool only	12	2.3
Hack/transit	10	1.9
Vanpool only	5	1.0
Hack only	3	0.6
Subway only	3	0.6
Taxi only	2	0.4
Other combinations	64	12.1
No response	9	1.7
	528	100.0

Note: Transit modes are bus and subway (heavy rail). Paratransit modes are carpool, vanpool, taxi, and hack.

exclusively to commute to work. It is evident that low-wage city labor uses a wide mix of modes to commute primarily to city jobs, but there is a predominant reliance on transit and an assortment of paratransit modes.

When asked if respondents would take a job at each of the six activity centers, earning the same wage they did when employed, 28.3 percent stated they would not work at any of the activity centers, while 14.6 percent stated they would accept a job at each one. Almost nine percent stated they would work only in Towson. Owings Mills and Towson were selected by 3.8 percent and Hunt Valley, Towson, and Owings Mills were selected by 3.2 percent. The other activity centers singly or in combination were selected consistently by less than two percent of the respondents. Only one and one-half percent did not respond to the question.

A substantial portion of respondents would not commute the relatively long distances to jobs at suburban centers that pay similar wages to those in the city. The relatively shorter distances of Towson, Hunt Valley, and Owings Mills to the northern areas of the city accounted for the higher percentages of selection.

When asked of those who would not accept a job at an activity center what incentives would be needed in order to accept a job, 17.3 percent of respondents selected "higher pay" only. Almost 15 percent selected "higher pay" and "more convenient transportation." Another 10 percent selected a

combination of "higher pay," "flexible work schedule," and/or "more convenient transportation." "More convenient transportation" exclusively was selected by 8.7 percent and "higher pay," "more convenient transportation," and "cheaper transportation" were selected by another 6.8 percent of respondents. The options regarding child care and other incentives elicited insignificant responses. Approximately 18 percent of respondents did not address this question at all, either because they chose not to or because they had stated they would accept a job at each activity center.

It is evident that higher pay is a critical factor in increasing the accessibility of low-wage city labor to suburban employment. Associated with the desire for higher pay is the demand for transportation services that are convenient for commuting to the suburbs.

One question on the questionnaire presented a scenario of an available job in the suburbs accessible by private automobile, bus, or van service. The monetary costs, travel times, and waiting times for each alternative were given as well. A fourth alternative was not to take the job because the trip was too long or costly with any of the transportation alternatives. In response to this question 12.1 percent stated they would not take the trip at all. Approximately 37 percent stated they would take the automobile and 23.7 percent stated they would take the bus. The van alternative was chosen by 12.5 percent of respondents. Although the question asked that respondents choose only one of

the three options, 5.3 percent of respondents chose both van and bus as the preferred means of transportation. Approximately 10 percent of the respondents did not address the question or did not answer meaningfully.

While the largest single group of respondents selected the automobile as the desired mode for commuting to suburban jobs, the groups selecting the bus and/or van constitute a larger percentage. However, many respondents still would not commute because of the costs and time involved.

The next question asked if the automobile were chosen, what incentives would respondents require to switch to the van or bus. Approximately 37 percent did not respond either because they did not choose the automobile or they chose not to answer the question. Almost 15 percent stated they would not switch from the automobile regardless of incentives. The most often chosen incentives for switching were "faster bus or van" (7.4%), "more frequent bus or van service" (4.9%), and "less waiting time" (4.9%). "Cheaper bus or van" was picked by only three percent of respondents. The answers to this question confirm the perception that under current conditions higher quality public transportation is more important than monetary cost of public transportation in discouraging use of the automobile for commuting to suburban jobs.

In comparing the "stated preferences" of respondents to a hypothetical job in the suburbs to the "revealed preferences" for commuting to their last job, some interesting differences became

apparent. If one excludes the number of respondents who did not answer the question regarding mode of transportation to previous job, the percent that used the automobile to commute to work approximated the percentage of automobile ownership. Only 29 percent of respondents owned at least one automobile. However, again excluding those not responding, the percent that would select the private automobile to commute to a suburban job was significantly greater than the percent of automobile ownership and the percent of automobile use for the previous job. The percent that would commute by transit was, correspondingly, significantly less. The use of paratransit was also less for the suburban job commute.

While one should be cautious in comparing "stated preferences" with "revealed preferences," it is apparent that the choice of modes for commuting to suburban jobs would be different from commutes within the city. Many respondents perceive that an automobile is preferable for commuting to a suburban job despite its costs and that transit and paratransit modes are currently too inconvenient for that purpose. In reviewing the responses to the questions regarding incentives for taking a job in the suburbs or for selecting certain modes, it seems that higher pay and more convenient public transportation are the keys to greater accessibility to suburban jobs.

In order to gain a deeper understanding of the relationships among the responses, all of the survey responses were subjected to a factor analysis. All of the variables were reduced to nine

factors with eigen values greater than one. After a varimax rotation of the factors only the first four factors with the highest eigen values had loadings that could be interpreted meaningfully (Table 5-4).

The variables of family size, wages paid in last job, and travel distance to work loaded positively and strongly on the first factor. This result implies that there are positive relationships among family size, wages, and travel distance. Those families with members earning higher wages tend to travel longer distances to work.

The second factor exhibited strong, positive loadings by mode of travel to work and automobile ownership. Those who own automobiles tend to use them to travel to work. Those who do not used other modes to travel to work. Since wages did not load on this factor significantly, automobile ownership apparently does not vary by level of wage within this low-wage group. While it has been shown in other studies that automobile ownership and use are directly and positively related to income, it seems to be not directly related to the small variation in wages paid to low-wage labor that work and reside in the city.

The third factor related the type of occupation in the last job to the type of new occupation sought, since those variables loaded positively and strongly. The fourth factor exhibited strong, positive loadings by the variables: sex and race. The majority of respondents were after all black and female.

In addition to the factor analysis, step-wise multiple

Table 5-4

Factor Analysis of Survey Responses:
Rotated Factor Loadings (Varimax)

Variables	Factors I	II	III	IV
1) Previous Occupation			.81	
2) Occupation Sought			.75	
3) Residence Zip				
4) Work Area				
5) Work Zip				
6) Own Car		.76		
7) Commute Modes		.83		
8) Travel Distance	.76			
9) Travel Time				
10) Fare				
11) Accept Suburban Job				
12) Job Incentives				
13) Suburban Mode				
14) Mode Incentives				
15) Family Size	.87			
16) Age				
17) Sex				.80
18) Race				.73
19) Education				
20) Skills				
21) Wages	.80			
22) Wages/Family Size				
Cumulative Proportion of Total Variance	16.1%	23.3%	30.4%	37.0%

Note: Only loadings > ± 0.7 are shown.

regressions were attempted. Regressions between demographic, education, and wage/cost levels as independent variables and travel mode(s) and travel times to last job as dependent variables yielded no significant relationships. Evidently, among low-wage city residents in the labor force the choice of modes and the travel times to work were more a function of location of job opportunities and presence of transportation alternatives rather than demographic, education, or wage characteristics.

CHAPTER 6

METROPOLITAN AREA TRANSPORTATION SYSTEMS

Public Sector Services

The Baltimore Metropolitan Area is characterized by an extensive system of arterial and collector roads and streets. The major roadways are aligned in a radial pattern focussing on the CBD of Baltimore City. Two Interstate Highways originate in Baltimore and a third is the major north to south travel corridor on the East Coast. There is one circumferential highway, I-695, that allows through traffic to bypass Baltimore City entirely. This roadway, as in other metropolitan areas, has become a commuting "main street." Substantial commercial and residential development exists along this roadway, which results in a high proportion of local commuter traffic.

The Mass Transit Administration (MTA), an agency of MDOT, is the mass transit provider in Baltimore City and Baltimore and Anne Arundel Counties. Howard and Harford Counties are served to a limited extent by MTA-sponsored private sector commuter services. MTA services include an eight mile heavy rail line from Owings Mills to the Baltimore CBD, local and express bus services, and paratransit services for the area's disabled people. Paratransit services include: Mobility, an advance reservation, door-to-door lift-equipped van service; a contract taxi service for disabled persons who can ride conventional vehicles; and Call-A-Lift bus service, a one day in advance subscription service that is part of the local bus system.

Formal carpooling efforts in the metropolitan area began in 1974 and focussed on the COMPUTE-RIDE data base, maintained and operated by Vango, a third party brokerage agency of the state and a joint effort by Baltimore City, the MTA and BRCOG. Vango initially conducted hundreds of surveys among major employers to match commuters for carpooling. County ride-sharing offices continue to maintain the data base for matching of carpoolers. The vanpooling program, which was sponsored by Vango, is now sponsored by MTA and operated by the county ride-sharing offices. Vans, obtained from leasing firms, are leased to groups of commuters who wish to establish a vanpool. Other vanpooling programs are operated by individual firms for their employees.

Despite an apparently well-developed, multimodal urban transportation system provided by the public sector, there are acknowledged problems of accessibility, mobility, and congestion in the metropolitan area:

> The surface transportation system of the Baltimore Region is increasingly unable to serve the growing and dispersed pattern of urban travel.... By the year 2010, vehicle miles traveled in the Baltimore Region will have increased at a dramatic rate. This means more people in more cars driving more miles than any other time in our history. Two factors in particular are stretching the transportation system to its limits: the changing nature of the work force and the growth of suburban job centers.(RPC, 1989)

This scenario of the metropolitan area's transportation system in the future is the expected result of current trends. Whether these trends will continue to 2010 is indeed open to question, but the trends are sufficiently established to warrant the

concern and attention of the public.

Average daily traffic in the region has continued to increase faster than population, income, or number of households between 1970 and 1987. The private automobile dominates urban trip-making and public transit's ridership has stagnated in the 1980s. Increased trip-making by automobile is characteristic of an affluent metropolitan area that continues to grow in population and economic development. Demand for road space is exceeding capacity during peak hours on many of the region's roadways. The radial design of the high-capacity road network does not channel multidirectional trips well (RPC, 1989). The dispersed nature of jobs, housing, and commercial activities is not compatible with the current roadway pattern. Chronic traffic congestion is expected to plague the corridors that feed into the suburban job centers. Since transit service to suburban job centers is limited, employment opportunities for individuals without access to an automobile are reduced.

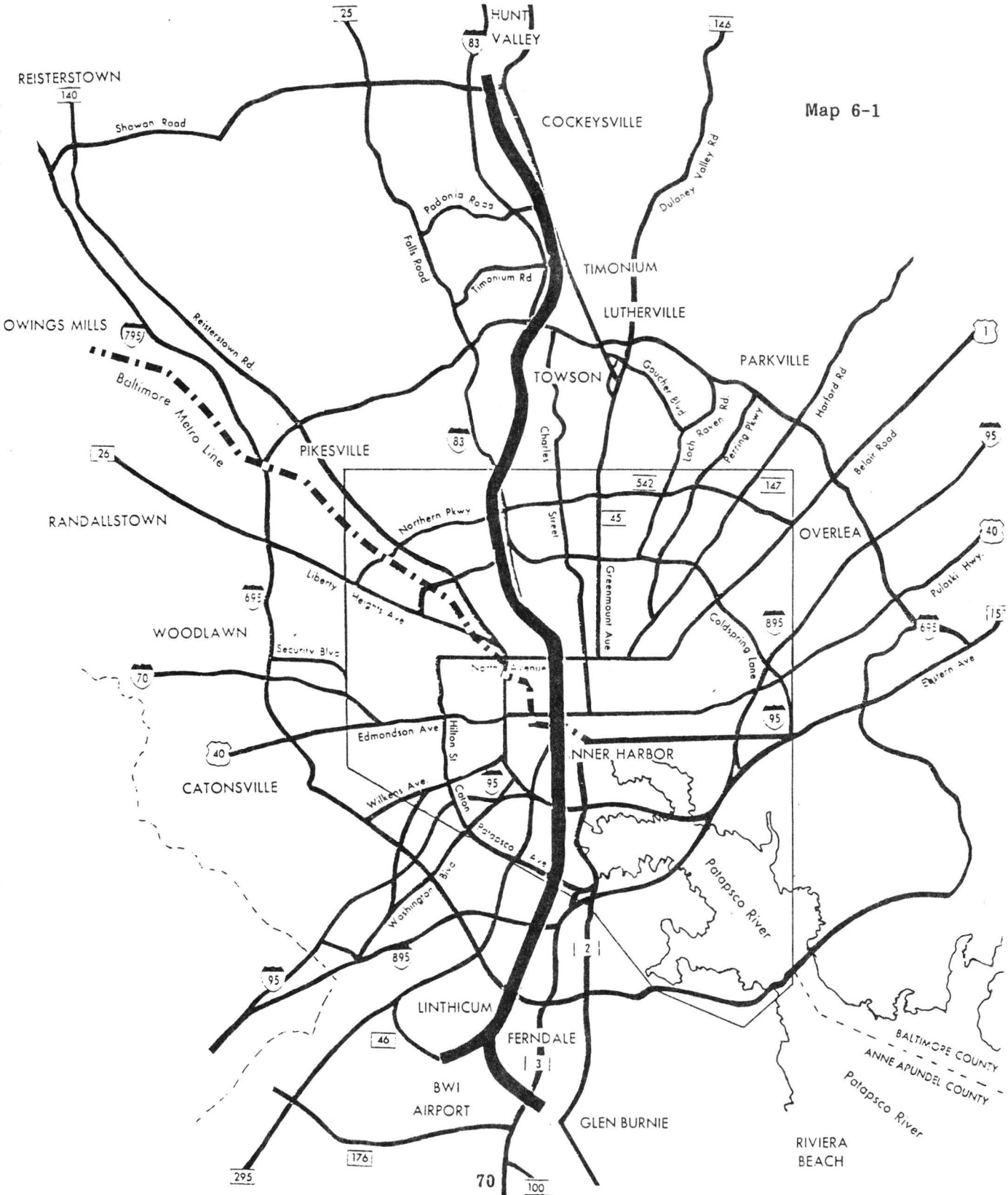
BRCOG and state transportation policy is supporting incremental improvements in the current road system but with few major additions to the existing network. By 1995 there will have been some widening of existing roadways, such as I-95 north of I-695 to State Route 24. Route 100, connecting Anne Arundel and Howard Counties, will be one of the few new high-volume roadways to be built. However, none of these roadway improvements can be considered as addressing the conditions constraining reverse commuting from the city to suburban activity centers.

The state has and is planning several transit projects that have the expressed objective of improving access between the city and suburban activity centers. The most notable new project is the Central Corridor Light Rail Line, a 27 mile rail line linking Hunt Valley, Towson, the Baltimore CBD, Glenn Burnie, and BWI Airport when completed (Map 6-1). It is worth noting that the selected corridor will not traverse many of the areas in the city that have been identified in this study as relatively inaccessible to suburban activity centers. Certainly collector and distribution services could tie these inaccessible areas to the light rail line, but whether travel times would be significantly shortened from the current situation is unknown.

The state is also planning to construct Section C of the heavy rail line serving Owings Mills and the Baltimore CBD. Section C will link Charles Center to Johns Hopkins University Hospital to the east. Thus, more inner-city areas will have direct rail access to the Owings Mills area.

Commuter rail services could potentially have a great impact on facilitating commuting from the city to suburban locations. The existing service from the Baltimore CBD to Washington via the Route 1 corridor of Howard County will be improved over the next few years. New and refurbished stations along the existing line, a possible rail link to Columbia, and new parking lots and bus services are planned. There are also plans for commuter service from the Baltimore CBD north to Harford and Cecil Counties by way of White Marsh after 1995.

Map 6-1



While building new capital-intensive rail systems may be appropriate in high density corridors with high levels of ridership, relatively low-density suburban development is difficult and expensive to serve by mass transit. An often used strategy for enhancing ridership at suburban rail stations is to build park-and-ride lots that draw individuals in private automobiles from a large market area. This strategy by itself is quite land-intensive, may increase automobile congestion around rail stations, and provides no system of distribution for reverse commuters. Collection and distribution public transportation systems would be needed to move people between rail stations and distant residential areas and employment centers. Usually, conventional bus transit is used to collect and distribute riders. In suburban areas long headways, circuitous routes, poor maneuverability and excess vehicle capacity often make conventional buses cost-ineffective. Thus, demand responsive paratransit modes, such as van services, jitneys and shared-ride taxis may be appropriate.

In high density areas some reverse commute trips may be so dispersed and low-volume that line-haul rail systems may not be a viable option. In this case line-haul paratransit systems would be the answer. An example of such a paratransit system is the van service operated by The Human Development Institute (HDI), a non-profit organization funded by the City of Baltimore. HDI provides career development, training, placement service, and reverse commute transportation for Baltimore City welfare

recipients. HDI operates van services seven days a week between Baltimore and Ellicott City/Columbia in Howard County and Annapolis in Anne Arundel County. In 1988, 65 percent of HDI's graduates that work used the van service, because only 10 percent of HDI graduates had access to an automobile. Other low-wage employees that reside in Baltimore City used the vans as well. The van service is funded by Baltimore City, several suburban employers, and the riders.

It should not be a surprise to anyone that extensive, new public sector line-haul, collection, and distribution services would require a substantial investment. Maryland's operating and capital costs for transit grew dramatically in the first half of this decade as a result of infrastructure improvements and expansion and higher fuel prices and labor costs (Reightler and McGimsey, 1985). Revenues increased at a slower rate than costs because fares remained low, system size and service quality remained high, and ridership declined. Also, federal participation in the funding of transit in Maryland declined over the same period. In 1983, $107 million or 28 percent of the state transportation trust fund revenues were used for transit operating and capital costs in the state. MDOT projected that public transportation costs will consume $184 million or 35 percent of the transportation trust fund revenue in 1990. This projection was made prior to the formulation of plans for new light rail transit projects throughout the state.

In order to increase the revenues to the trust fund the

state raised the motor fuel tax by five cents per gallon in 1987 to a level at that time among the highest in the nation. As a result of the Central Corridor Light Rail Line and other planned light rail projects, some transportation planners and policy makers have mentioned the need to raise the fuel tax in the 1991 session of the state legislature.

The Role of the Private Sector?

It has been well established in the literature that transit properties can often achieve significant cost savings, when service is provided by the private sector (Morlok, 1984; Morlok and Viton, 1985; Carter-Goble Associates, Inc., 1987). Private providers usually have lower operating costs and can often provide the service at a lower fare. The private sector has established an enviable record of high quality service at low cost, when there is close public oversight of service and safety.

In keeping with UMTA policy the MTA has offered the private sector new opportunities for providing bus service in the metropolitan area. A member of the Maryland Bus Association, an association of private sector bus services, is on the MTA Transportation Steering Committee. Private sector carriers operate express commuter services under contract to the MTA from some outlying suburbs to the Baltimore CBD.

MTA and BRCOG have been cooperating in support of private sector efforts to establish new unconventional public transportation services. MTA in cooperation with BRCOG is establishing the Access to Jobs Program, which provides a

regional framework for Entrepreneurial Services grants dedicated to reverse commuting. The objectives of the program are to identify markets for reverse commute services, promote the provision of new public and private sector services, and provide a forum for matching supply and demand. The program will establish a clearinghouse to match the supply of and demand for reverse commute services. MTA staff will help design, coordinate, and develop new services initially along one travel corridor and ultimately throughout the city.

BRCOG has supported the establishment of transportation management associations in the metropolitan area as a means not only to manage the demand for transportation but to encourage new private sector services in specific areas. Two new TMAs are being planned for Columbia and Hunt Valley. BRCOG received a grant from UMTA to determine the feasibility of establishing a buying cooperative as a way for private providers to incur savings in purchasing fuel, insurance, and maintenance. Another grant involved the development of a marketing process to assist private providers in targeting markets and promoting services. BRCOG has also periodically issued a directory of private sector public transportation services, which lists the various firms and kinds of services offered in the metropolitan area.

According to the 1987 directory of private sector services, nine firms offered services that could be used for reverse commuting (Reightler and Pezzotta, 1987). Three firms offered service between the city and BWI Airport, which could be used for

commuting to the BWI activity center. Six firms offered regular commuter services during peak hours between some of the selected activity centers and Baltimore City. These firms, most without subsidy, have served very specific market niches that have not been served by or have been infrequently served by MTA. The first directory concluded that:

> ...a potential commuter market also exists for these service providers...these companies are a potential source for improving mobility on a more region wide basis.... To expand their markets these operators must be made visible to the traveling public." (Reightler and Pezzotta, 1985)

Insufficient marketing and planning are certainly constraints facing private sector public transportation in Baltimore (Kilkenny, 1984). Many providers are small and relatively unsophisticated. There are other constraints as well. In a recent study of transportation regulation in the Baltimore Metropolitan area, it was found that for-profit public transportation services that are not under contract to a public agency have a competitive disadvantage vis-a-vis public and non-profit services (Farkas and De Rouville, 1988). State common carrier and county taxi regulations limit the services and fix the fares that the private sector can offer. Publicly owned systems are heavily subsidized, while non-profit ride-sharing is exempt from regulation. The study concluded that the private sector could expand the level and variety of services, if there were regulatory reform.

In addition to regulated private sector services, there

exists in Baltimore City an extensive extra-legal "hack" industry, i.e., unregulated private automobiles for-hire, serving inner-city neighborhoods. Hacks are often available at shopping centers or other commercial centers in residential areas and carry people throughout the city. Hacks have been described by those that have used their services as less expensive and more available in inner-city areas than taxis and more frequent and flexible than the transit system. Unfortunately, because of its "underground" nature the hack industry is not well known or understood by transportation planners and policy makers.

It is apparent from the existence of regulated and extralegal services that there is a demand for public transportation services positioned somewhere between conventional transit and the single-occupant taxi or private automobile. The historical development of mass transit, the evolution of transportation regulation, and the narrow scope of government policy on funding of transit systems in the past have contributed to a paucity of options in urban transportation, particularly for reverse commuting. The options are still primarily limited to the private automobile or taxi and fixed route and schedule public mass transit systems. Instead, there needs to be a continuum of urban transportation services available to the commuting public.

CHAPTER 7

UNEMPLOYMENT AND JOB ACCESSIBILITY

Summary and Conclusions

It is apparent that the increasing geographic disparity in metropolitan areas between employment and residence of low-wage labor has not been mitigated by public transportation. The Baltimore Metropolitan Area has also undergone an economic and geographic restructuring, which has had a profound impact on job accessibility. Since 1970, the metropolitan area has been evolving toward a high technology and services economy and has continued to decentralize its employment and population, while its built-up area has increased in extent. The urban decentralization has involved jobs at all skill levels and middle to upper-income households, while low-income, transit dependent households have remained in the inner-city.

The suburban counties in general and the suburban activity centers in particular have played a monumental role in the economic growth of the metropolitan area. Baltimore City's role has continued to decline relatively and absolutely. The realignment of labor and jobs in the metropolitan area and the concentration of development in suburban activity centers have fundamentally influenced commuting patterns and mode choice.

Between 1960 and 1980 suburb-to-suburb and city-to-suburb commuting to work increased. Among low-income households in the city, predominantly black households, vehicle ownership rates were low and, consequently, transit dependence was high. Between

1980 and 1988 vehicle ownership rates and driving alone increased dramatically throughout the metropolitan area. Ride-sharing lost its significant share of work-trips, while transit had difficulty maintaining its ridership. The suburban counties attracted relatively fewer commuter trips by Baltimore City residents, despite greater automobile ownership and a city employment base that continued to erode. City residents have been less willing and/or less able to commute to job opportunities outside their jurisdiction of residence than suburban county residents. Firms in many suburban locations have had difficulty attracting low-wage and low-skilled labor.

Several low-income areas within the city or areas that have suffered large losses of employment over the years are relatively inaccessible to employment opportunities at suburban activity centers. These relatively inaccessible areas in the city have the longest travel times to all suburban activity centers. Residents of these areas would in general encounter travel times longer than those from other areas of the city.

The areas of relative inaccessibility by transit are in northeast, southwest, and east Baltimore. These areas, particularly the northeastern and eastern, are affected by the more distant location of the activity centers that are north and southwest of the city. The southwestern area is relatively inaccessible because of the long distances from the northern activity centers and because of the absence of transit links to the Columbia/Route 1 activity center until relatively recently.

The relative inaccessibility of areas within the city is compounded by the fact that city-to-suburb transit travel times are substantially longer than automobile travel times and often longer than suburb-to-city transit travel times. Transit travel times (running times only) are approximately three times the duration of automobile travel times. Waiting, walking, and transfer times, which vary greatly during the day, can add greatly to travel time. For representative origins and destinations city-to-suburb transit and automobile travel time differentials are generally greater than suburb-to-city time differentials.

The implication of the accessibility analyses results is that city residents are faced with longer travel times for commuting to suburban jobs by transit than suburbanites commuting to the city by automobile or transit. Longer travel times for the reverse commute to work are an undue burden on the transit-dependent, low-wage unemployed residents of the relatively inaccessible areas.

The surveys of employers at suburban activity centers and of low-wage unemployed city residents sought to gain more insight into the relationships between job accessibility and employment. Each of the employer surveys identified accessibility problems as among the most serious at their respective centers. The automobile was identified as the predominant means of commuting by employees, so congestion was a concern to employers. All of the centers were served by mass transit prior to conduct of the

employer surveys. Yet, the surveys were consistent in identifying the need for additional public transportation services to facilitate commuting by employees, particularly low-level employees.

The survey of low-wage unemployed city residents seeking employment found that most of them are young, black adults with the majority of them women. The majority of respondents have at least a high school education and some special skills. Thus, it would be correct to conclude that being a low-wage, unemployed laborer is not necessarily the result of being low-skilled, but may be attributed to other reasons.

The median wage for the respondents from the previous job was $6.00 per hour or approximately $12,000, if employed all year. According to the factor analysis, there was a strong positive association between wages and distance travelled to work. The majority of respondents travelled less than 10 miles to work, however. The median travel time to commute to the last job was 30 minutes.

Only 29 percent of the respondents reported owning at least one automobile, while the remainder, 71 percent, had no automobile. The factor analysis showed that there was a strong relationship between automobile ownership and automobile use for commuting. The regression analyses indicated that this level of ownership and use was not related to the small variation in low wages paid or to demographic factors. Evidently, among low-wage city residents in the labor force the choice of modes and the

resultant travel times to work were more a function of location of job opportunities and presence of transportation alternatives.

Low-wage city labor when last employed used a wide variety of modes to commute primarily to city jobs, but there was a predominant reliance on transit and an assortment of paratransit modes. Ride-sharing through carpools and vanpools was utilized by a small number of respondents, probably because of the low level of automobile ownership and the relatively short commute to jobs in the city. Previous research has also pointed out that low-wage labor tends not to use ride-sharing as a means of travel to work, despite its financial advantages.

Approximately half of the respondents identified higher pay as a critical factor in increasing the accessibility of low-wage city labor to suburban employment. Associated with the desire for higher pay was the demand for transportation services that are convenient for commuting to suburban activity centers. The largest single group of respondents (37%) selected the automobile as the desired mode for commuting to a suburban job. However, the groups that selected the bus and/or van constituted a larger percentage in total (42%) than that for the automobile.

Of the respondents that selected the automobile slightly more stated they would switch to public transportation than those who would not switch, if higher quality public transportation (faster, more frequent, less waiting time) were available. Monetary cost of public transportation was not considered important for discouraging use of the automobile. However, more

than a quarter of the respondents still would not commute to a suburban activity center because of the costs and time involved.

The public sector has acknowledged that despite an apparently well-developed, multimodal urban transportation system, there are problems of accessibility, mobility, and congestion in the metropolitan area. The state has been planning several rail transit projects that have the expressed objective of improving accessibility between the city and suburban activity centers. Rail systems, in order to be cost-effective, must operate along high population density corridors and require abundant collector and distribution services to support them.

In suburban areas long headways, circuitous routes, poor maneuverability and excess vehicle capacity often make mass transit cost-ineffective as a line-haul, collector or distribution mode. Thus, demand responsive paratransit modes, such as van services, jitneys and shared-ride taxis may be more appropriate under those conditions. Even in high density areas some reverse commute trips would be so dispersed and low-volume that line-haul paratransit systems would be needed.

The state has supported the increased participation of the private sector in providing public transportation under contract. Private providers usually have lower operating costs and can often provide service at a lower fare, but they face significant constraints. Private sector services have not been sufficiently marketed to the commuting public. Many providers of service are small operators that lack the resources for planning and

marketing programs. Economic regulation of for-profit public transportation services that are not under contract to a public agency has been onerous. For-profit services have had a competitive disadvantage vis-a-vis subsidized public sector and non-profit services.

The authors conclude that suburban activity centers are relatively inaccessible from many areas of Baltimore City because reverse commute transit travel times are longer than suburb-to-city commutes by automobile and transit. The authors also conclude that there is substantial demand for public transportation services positioned somewhere between conventional transit and the single-occupant taxi or private automobile. Low-wage labor uses paratransit modes in significant numbers and desires higher quality public transportation. At present the options for reverse commuting are still primarily limited to the private automobile or taxi and fixed route and schedule public mass transit systems. In order to increase accessibility of the low-wage unemployed to suburban jobs low-wage labor should have greater opportunity to live closer to suburban activity centers and there should be an assortment of public transportation services for reverse commuting.

Recommendations

The first major policy recommendation is to increase the amount of low-income housing in suburban areas through more mixed use development. It has often been a political "hornet's nest" to attempt interspersal of low-income housing among middle- and

upper-income residential areas because of the fear of property value reductions. It is certainly feasible to require developers of commercial and industrial projects to provide low-income housing as an integral part of a project. Thus, nearby housing would be available for the low-skilled and entry level personnel of commercial and industrial firms.

It is self evident that providing low-income housing in and near suburban activity centers would dramatically reduce travel times and increase accessibility to employment. This recommendation would require fundamental changes in housing policies and zoning regulations in many jurisdictions and, thus, may continue to be the most difficult recommendation to implement. However, in the long run it is the most effective way of addressing the problem of inaccessibility to employment.

The second policy recommendation is to improve the availability, quality, and speed of public transportation for reverse commuting. Many low-wage, unemployed workers require higher wages and desire the automobile or higher quality public transportation for commuting to a job at a suburban activity center. Higher levels of automobile ownership would occur eventually as job opportunities become less available in the city and more available in the suburbs and as higher wages are paid by the private sector.

As wages required to attract low-wage labor to suburban jobs increase, as opportunities for employment in the city diminish, if transit and automobile travel time differentials remain large,

and if convenient public transportation alternatives are unavailable, the automobile will be the commuting mode of choice. Efforts that continue to provide conventional CBD-oriented mass transit services for reverse commuting by low-wage labor would become even more ineffective and inequitable. Thus, greater efforts are needed to divert automobile users to a host of public transportation alternatives.

If it is politically untenable to increase residential densities in suburban areas and place restrictions on the use of the single-occupant automobile, then about all that can be done to shift drivers to public transportation is to provide services that cost-effectively approach or exceed the speed of the private automobile. The modes that can meet this criterion are the exclusive guideway transit systems, such as commuter rail, light rail, and busways and the paratransit modes, such as carpools, vanpools, jitneys or shared-ride taxis, and hacks.

Since metropolitan areas continue to decentralize, paratransit modes are likely to provide great improvement in accessibility to suburban activity centers. They can more easily provide cost-effective service to dispersed commuting patterns and during off-peak hours than transit can. Mass transit systems are perhaps appropriate for high density corridors of residential and commercial development, although they are capital-intensive, consume much time in collection and distribution, and tend to be geographically inflexible on a rapidly changing metropolitan landscape.

In order to increase accessibility of low-wage labor to jobs at suburban activity centers and increase the use of public transportation by all commuters in general, the authors make the following program level recommendations:

1. If it can be accomplished cost-effectively, MTA should reconfigure existing transit routes to provide faster reverse commute services from "inaccessible" inner-city areas to suburban activity centers.

2. The MTA Access to Jobs program will provide a "clearing house" that will match low-wage labor to available public transportation services. In order to succeed MTA must change its mission from that of "sole provider" of public transportation to one of broker for several providers of service, public and private. Since low-wage labor is not a homogeneous group, a brokerage service should match them with a range of alternatives to the single-occupant automobile and mass transit, if mass transit is not convenient for reverse commuting.

3. The state, counties, and private sector employers must markedly expand and aggressively market vanpool and carpool programs to the low-wage labor market. Since such labor generally has not travelled long distances to work, perhaps it has been assumed by employers that vanpools or carpools would not be advantageous to them. Carpooling and vanpooling are certainly advantageous for commuting over the relatively long distances to suburban activity centers.

4. Government should reform common carrier and taxi regulations

to allow an assortment of for-profit public transportation modes to operate. This reform would entail easing of the economic regulations but not the safety regulations on public transportation. Currently, economic regulations restrict competition, limit the availability of services, and fix the fares that can be offered. The conditions warranting these regulations have changed and the private sector should be allowed more flexibility to operate innovative new services. Perhaps some of the more entrepreneurial among the unemployed would take advantage of additional freedom to provide reverse commute services.

5. The MTA should offer additional opportunities for the private sector to provide services under contract. Van services or shared-ride taxis could provide convenient commuter services along low-volume corridors or at off-peak times when transit service is often infrequent. The public sector should subsidize those private sector services not under contract that clearly result in benefits to society. Government oversight is certainly required to ensure that the subsidies are used effectively and equitably.

6. Since many private providers are small, relatively unsophisticated operations, the public sector should establish a program to assist groups or organizations of private providers. This program could support the conduct of market research and would disseminate information on marketing, planning, and financial analysis. It could also provide a forum for discussion

of problems facing private sector public transportation.

Appendix A

JOB COMMUTING SURVEY

1. When you were employed, what did you do?_____
   What kind of job are you looking for? _____

2. What is the zip code where you live?_____
   What part of Baltimore or other place did you work in?
   _____
   If you know the zip code there, what is it? _____

3. Do you own a car? a._____yes b._____no

4. When you were employed what did you use to travel to work? (check all that apply)
   a.___own car
   b.___carpool
   c.___taxi
   d.___hack
   e.___vanpool
   f.___bus
   g.___subway
   h.___other,(please identify)_____

5. How far did you travel to work?_____miles.
   How long did it take?_____minutes.
   If you took taxi, hack, bus, or subway, what was the total one-way fare? $_____.

6. Would you take a job, paying what you made before, in:

			(check yes or no for each)
a. Hunt Valley	____yes	____no	
b. Owings Mills	____yes	____no	
c. White Marsh	____yes	____no	
d. BWI Airport	____yes	____no	
e. Columbia	____yes	____no	
f. Towson	____yes	____no	

7. If you answered no to any of the places in question 6, what would it take to get you to travel to that job? (check all that apply)
   a.___higher pay
   b.___child care at work
   c.___cheaper child care elsewhere
   d.___flexible work schedule
   e.___cheaper transportation
   f.___more convenient transportation
   g.___other(explain)
   _____

8. If you found a job in the suburbs and you can get there by bus, or van service, or your own car, which would you choose? (check one)

	cost	travel time	waiting time
a.___ own car-	$4.50 one-way	40 minutes	0 minutes
b.___ van service-	$3.50 one-way	50 minutes	10 minutes.
c.___ bus-	$2.50 one-way	60 minutes	20 minutes.

d.___trip to job takes too long or costs too much.

9. If you picked your own car in question 8, what would it take for you to pick the van or the bus? (check all that apply)
   a.___faster bus or van service
   b.___more frequent bus or van service
   c.___cheaper bus or van service
   d.___less waiting time
   e.___more comfortable bus or van
   f.___I would not switch from my own car

10. How many people are in your family?_____

11. If you have children, how do they get to day care or school? (check all that apply)
   a.___I drive them
   b.___someone else drives them
   c.___bus
   d.___walk
   e.___other, explain:

12. If you drive them to school or day care, did this cause problems in geting to work on time, when you were employed?
   a.___yes b.___no

13. What are the main problems in finding and getting to a job in this area?

_____

_____

14. Age: a.____Under 18 b.____18-24 c.____25-39
   d.____40-54 e.____54+

15. Sex: a.____male b.____female
   Race: a.____black b.____white c.___hispanic d.___other

16. Education: a.____less than high school
   b.____high school graduate or GED
   c.____some college
   d.____college graduate

17. Do you have special training/skills? (please describe)

_____

18. When you were employed, how much did you make:
a year? $_____
or a week? $_____
or an hour? $_____

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