

MN DEPT OF TRANSPORTATION



3 0314 00024 5216

CENTER FOR

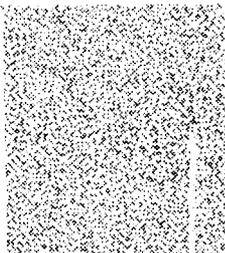
TRANSPORTATION
STUDIES

UNIVERSITY OF MINNESOTA

**TRAVEL BEHAVIOR,
GENDER, AND
SOCIAL CLASS
IN THE TWIN CITIES**

**Elvin K. Wyly,
Geography**

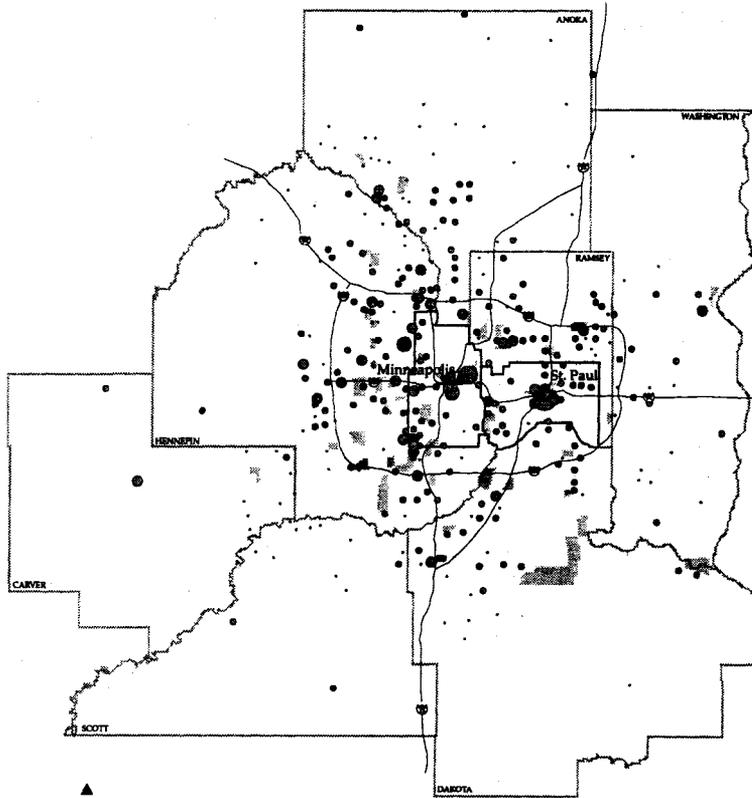
CTS
HE
372
.M6
W95
1995



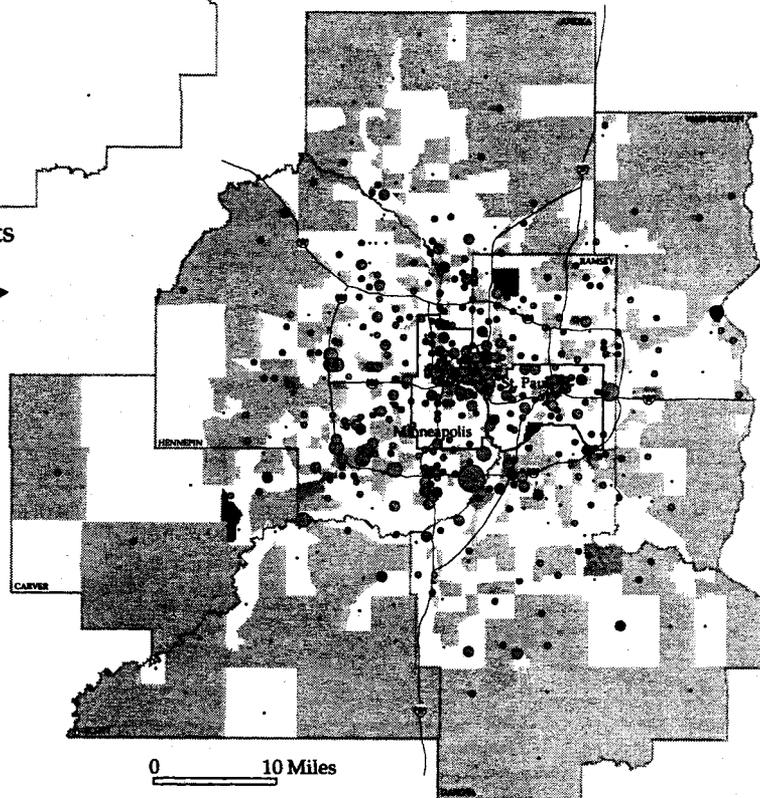
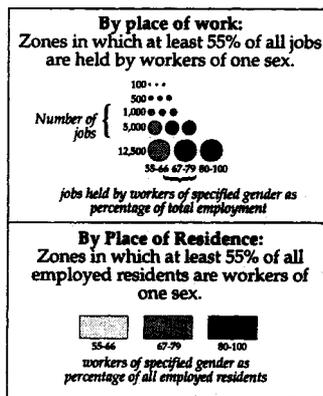
TRAVEL BEHAVIOR, GENDER, AND SOCIAL CLASS IN THE TWIN CITIES

Elvin K. Wily

Technical Report
 Research funded by the Center for Transportation
 Studies, University of Minnesota. John S. Adams,
 Principal Investigator.



▲ Female-dominated local labor markets
 Male-dominated local labor markets ▶



0 10 Miles
 Approximate Scale 1:760,000

TRAVEL BEHAVIOR, GENDER, AND SOCIAL CLASS IN THE TWIN CITIES

By
Elvin K. Wyly

Research funded by the Center for Transportation Studies, University of Minnesota.
Principal Investigator: John S. Adams, Professor of Geography, Planning, and Public Affairs.

©1995 Elvin K. Wyly

September 1995

TABLE OF CONTENTS

List of Tablesv

List of Figuresvii

Acknowledgmentsix

CHAPTER ONE: INTRODUCTION..... 1

 Social and Spatial Divisions..... 1

 Overview and Findings of the Study..... 3

CHAPTER TWO: GENDER AND THE RELATIONSHIP BETWEEN HOME AND WORK11

 Introduction11

 Beyond the Journey to Work.....12

 Distance in Urban Transportation Research.....18

 Distance as Prestige19

 Distance as Oppression.....19

 Gender Differences in the Work Journey21

 Gender and Theories of Residential Differentiation.....24

 Summary and Conclusions.....26

CHAPTER THREE: DATA AND METHODS.....29

 Introduction29

 Observing and Measuring the Home-Work Link30

 The Public-Use Microdata Samples (PUMS)32

 The PUMS Dual-Earner Database34

 The Travel Behavior Inventory (TBI).....35

 The TBI Dual-Earner Database36

 Distribution of Dual-Earner PUMS and TBI samples.....42

 The Census Transportation Planning Package (CTPP).....42

 The CTPP Database43

 Mapping the Gender Division of Labor.....44

 A Conceptual Model of Married Women's Commuting45

 Modeling the Commuting Patterns of Married Women47

 Summary50

CHAPTER FOUR: LOCAL CONTEXT53

 Introduction53

 Labor Demand and Women's Employment53

 Metropolitan Spatial Structure and Women's Employment.....56

 Urban Realms and Axes of Growth.....58

 The Changing Geography of Women's Employment.....61

 The Current Picture69

 Conclusions73

CHAPTER FIVE: GENDER AND THE GEOGRAPHICAL STRUCTURE OF	
LOCAL LABOR MARKETS.....	75
Introduction	75
Where the Work Journey Ends	79
Geographical Variation of Commuting Patterns.....	83
Gender, Class, and Urban Social Space.....	91
Manufacturing.....	102
Administrative Support.....	106
Health Services.....	106
Service Occupations	112
Finance, Insurance, and Real Estate (FIRE).....	115
Gender and the Intraurban Wage Gradient.....	115
Conclusions	123
CHAPTER SIX: GENDER, SOCIAL CLASS, AND THE JOURNEY TO WORK	125
Introduction	125
Gender Differences in Urban Travel	126
The Geography of Social Class Among Dual-Earner Families.....	130
Behavioral Correlates of Gender Differences in Worktrip Length.....	144
Family Structure.....	144
Employment Status	145
Occupational Class	149
Income	154
Geographical Variation of Correlates of the Gender Gap	158
Modeling the Relations Among Gender, Social Class, and Commuting Behavior.....	158
Exploratory Analysis and Model Development	160
Bivariate Correlations.....	160
LISREL Model Development.....	162
The Final LISREL Model.....	164
Metropolitan Model Results	167
PUMA Model Results	169
Conclusions	173
CHAPTER SEVEN: CONCLUSIONS	175
Bibliography.....	179

LIST OF TABLES

3.1.	Distribution of Dual-Earner Household Samples.....	39
4.1.	Twin Cities Female Labor Force Participation, 1960-1990	64
4.2.	Twin Cities Labor Market Segmentation, 1990.....	71
5.1.	Employment in Major Job Concentrations, All Workers and Dual-Earner TBI Sample	85
5.2.	Worktrip Destination by Place of Residence, Dual-Earner TBI Sample	90
5.3.	Gender Composition of Employment by Occupation and Industry, 1990.....	98
5.4.	Labor Market Centralization by Occupation.....	99
5.5.	Labor Market Centralization by Industry.....	100
5.6.	Average Annual Earnings of Husbands and Wives by Place of Work.....	119
5.7.	Analysis of Variance of Annual Earnings by Place of Work, Occupation by Industry	121
6.1.	Travel Behavior Measures, Dual-Earner TBI Households.....	127
6.2.	Distribution of Dual-Earner Household Types.....	134
6.3.	Gender Differences by Place of Residence	138
6.4.	Gender Differences by Husband's Place of Work	140
6.5.	Gender Differences by Wife's Place of Work.....	141
6.6.	Gender Gap in Work Journey by Presence and Age of Children	146
6.7.	Gender Gap in Work Journey by Husband's Employment Status.....	147
6.8.	Gender Gap in Work Journey by Wife's Employment Status.....	148
6.9.	Gender Gap in Work Journey by Occupational Class.....	150
6.10.	Gender Gap in Work Journey by Household Income.....	155
6.11.	Gender Gap in Work Journey by Husband's Income.....	156
6.12.	Gender Gap in Work Journey by Wife's Income.....	157
6.13.	Gender Gap in Work Journey, Analysis of Variance Summary.....	159
6.14.	Labor Market Variables and Commuting Times of Wives, by PUMA.....	166
6.15.	Unstandardized Parameter Estimates, Metropolitan Model	168
6.16.	Unstandardized Parameter Estimates, PUMA Models.....	170

LIST OF FIGURES

3.1.	Public-Use Microdata Area (PUMA) Boundaries in the Twin Cities Metropolitan Area.....	33
3.2.	Traffic Analysis Zone (TAZ) Boundaries in the Twin Cities Metropolitan Area	37
3.3.	Dual-Earner TBI Households, by PUMA	41
3.4.	Conceptual Model of Commuting Time of Married Women.....	46
3.5.	Path Diagram for LISREL Model Specification.....	49
4.1.	Seven-County Twin Cities Metropolitan Area.....	54
4.2.	Female Labor Force Participation, 1950.....	57
4.3.	Twin Cities Rail and Industrial Axis	59
4.4.	Twin Cities Production Realm.....	60
4.5.	Twin Cities Lake and Amenity Axis.....	62
4.6.	Twin Cities Regional Service and Consumption Realm.....	63
4.7.	Female Labor Force Participation, 1960.....	66
4.8.	Female Labor Force Participation, 1970.....	67
4.9.	Female Labor Force Participation, 1990.....	68
5.1.	Workplaces, Men in Dual-Earner TBI Households.....	81
5.2.	Workplaces, Women in Dual-Earner TBI Households.....	82
5.3.	Selected Job Concentrations.....	84
5.4.	Workplaces of Dual-Earner TBI Households in PUMA 1400.....	88
5.5.	Workplaces of Dual-Earner TBI Households in PUMA 1600.....	89
5.6.	Workplaces of Dual-Earner TBI Households in PUMA 2400.....	92
5.7.	Male-Dominated Labor Markets.....	94
5.8.	Female-Dominated Labor Markets	95
5.9.	Major Job Concentrations for Males in Durable Goods Manufacturing.....	103
5.10.	Location Quotients for Males in Durable Goods Manufacturing	104
5.11.	Location Quotients for Males in Nondurable Goods Manufacturing.....	105
5.12.	Major Job Concentrations for Females in Administrative Support Occupations.....	107
5.13.	Location Quotients for Females in Administrative Support.....	108
5.14.	Location Quotients for Males in Health Services.....	110
5.15.	Location Quotients for Females in Health Services.....	111
5.16.	Location Quotients for Males in Service Occupations.....	113
5.17.	Location Quotients for Females in Service Occupations	114
5.18.	Location Quotients for Males in Finance, Insurance, and Real Estate.....	116
5.19.	Location Quotients for Females in Finance, Insurance, and Real Estate.....	117
6.1.	Occupation of Wife and Husband, Dual-Earner PUMS Sample.....	131
6.2.	Gender Gap in Income by Household Income, Dual-Earner PUMS Sample	133
6.3.	Average Work Journey of Husband, by Occupation of Husband and Wife	152
6.4.	Average Work Journey of Wife, by Occupation of Husband and Wife.....	153
6.5.	Path Diagram for Final Travel Time Model.....	165

ACKNOWLEDGMENTS

The essential paradox of learning is that one *owns* so little of such an intensely personal and private process. This paradox has stayed with me in the decade since Peter Gould introduced me to the posie of flowers gathered by a generation of geographers, and ignited in me a passion so that I might bind the flowers with my own thread.* I cannot summon a more appropriate image to describe the debts I've incurred in my years in Minnesota, and much of the insight in these pages belongs to my mentors, colleagues, and friends. For the chance to learn and to work with them, I am grateful.

My doctoral committee guided me through all stages of this project. John S. Adams, my advisor, has given me more than I can possibly acknowledge. John's patience and wisdom helped me to learn and grow in my years of graduate study, and working with him has been my most valuable professional experience. In the seminar room, on the streets of Chicago, and on the buses of Kirovsk, John showed me how to study, how to really *see* the rich tapestry of the city. John maintains a tireless commitment to his students, and his kind of leadership in the University and the community is indeed rare these days. I am indebted to Roger Miller for many gifts in and out of the classroom, and his careful attention and critique over the years have greatly improved my work. Roger's insight and teaching have enriched my geographical imagination in innumerable ways, and I aspire to the kind of Renaissance-structuralist-poststructuralist intellect that combines discussion of the finer points of Gramsci, Jameson, or Adorno with planning for the next barrage of ARC/INFO routines to tweak an historical database. Judith Martin gave me thoughtful feedback on many important points, and pushed me to clarify the implications of the findings. David Cooperman and Ed Goetz offered valuable comments and helped me to strengthen the logic underlying the project.

This study would not have been possible without the generous financial support of several agencies. The University of Minnesota's Center for Transportation Studies provided contract support during the 1994-95 academic year. The John R. Borchert / Center for Urban and Regional Affairs Fellowship supported my work in 1993-94. The University of Minnesota's Computer and Information Services provided computing grants between 1992 and 1995.

Several other faculty in the geography department helped at various points. Helga Leitner provided valuable comments on early versions of research proposals. Abdi Samatar moderated a seminar on proposal writing in early 1993, and this project grew out of those probing and challenging discussions. For suggestions, feedback, and critique, I also thank Will Craig, Robert McMaster, and Kathy Klink.

Susan Hanson, Director of the Graduate School of Geography at Clark University, read an early research proposal and steered me away from several pitfalls. I owe a great deal to her pioneering research on this important set of issues, and I hope my contribution does not fall too far short of the mark.

This project would have been highly unpleasant without the assistance of professionals in the University and elsewhere. Wendy Treadwell, of the University's Machine-Readable Data Center, performed truly astonishing feats of time-space compression, getting megabytes of data to me on extraordinarily short notice. Bob Paddock, with the Metropolitan Council, gave freely of his time and expertise when I needed things in a hurry. Steve Alderson helped in a number of ways, from project planning to data acquisition to discussing the transport policy aspects of the results.

*"I have gathered a posie of other men's flowers, and only the thread that binds them is my own." --Montaigne. Wavell, A.P. (1944). *Other Men's Flowers*. London: Jonathan Cape. Peter gathered the flowers of many of the men and women of geography, and his thread remains with me. Gould, P.R. (1986). *The Geographer at Work*. London: Routledge.

Many colleagues made graduate education the enlightening and exciting enterprise it is meant to be. Dan Hammel mentored me through many of my graduate years, and our joint research program is much like intellectual Spam™ (not too appetizing, but it seems to hold water). I am grateful for many hours of spirited debate (and debates with spirits) with Derek Shanahan, and I thank him for a valuable manuscript review a few years back (which I failed to acknowledge in the midnight rush to complete the report). I am fortunate to have worked with Melissa Loughlin on several projects, although the process has left both of us in need of a twelve-step program for census addicts. I have benefited greatly from discussions on all manner of things scientific with Steve Smela. At various points, my thinking has advanced through invigorating discussions with Eric Anderson, David Faust, Greg Flay, Terry Haverluk, Cathy Lockwood, Bill Lynn, Linda McCarthy, Dani Meier, Clay Mering, Byron Miller, Richa Nagar, Paul Roebuck, Kathy Schroeder, Phil Thibault, John Tichy, Lutalo Touré, and Yu Zhou.

I have incurred many debts to the dedicated support staff over the years. Bonnie Williams graciously guided me through the maze of graduate school maneuvers necessary for survival, and Jodi Larson kept me sane in the course of the correspondence, copying, and filing encountered along the way. Margaret Rasmussen is apparently under the illusion that I'm worth the trouble I cause, and she has saved me from the engulfing bureaucratic flames on many occasions. I thank Wayne Howell for maintaining my third-floor condominium and for countless late-night conversations.

Most of all, I thank Barbara VanDrasek, who endures too many late-night deadline scrambles in the Social Sciences Tower, leads me in wanderlust in New Ulm, Eveleth, Kingman, and Vdnk, and brings growth, purpose, and spirit to my life.

I find much of my identity in my parents. Without the love and support of Robert and the late Florence I would have learned nothing.

September, 1995

Center for Urban Policy Research
Rutgers, The State University of New Jersey
33 Livingston Avenue, Suite 400
New Brunswick NJ 08901-1982
(908) 932 3133, ext. 525
internet wyly@rci.rutgers.edu

CHAPTER ONE INTRODUCTION

Social and Spatial Divisions

Women work closer to home than men. Dozens of studies have yielded this finding, in settings ranging from mid-sized industrial towns in New England to metropolitan centers in Scandinavia and continental Europe.¹ Most scholars have overlooked issues relating to women's experiences in the public spaces of the city until recent years, but the knowledge that commuting patterns differ markedly by gender is certainly not new: scattered references to a gender gap in work-related travel may be found at least as early as the 1960s.²

In the last two decades intense debate has focused on the policy and theoretical implications of this recurrent finding, as well as its empirical parameters. Through the mid-1960s the finding of women's shorter worktrips was not viewed as particularly problematic or interesting, reflecting a broader tendency among urban scholars to ignore women in the study of public spaces.³ Yet by the mid-1970s, a substantial body of research (much of it sponsored by public transportation agencies) had emerged to document the travel behavior and transport needs of traditionally under-represented groups. This research underscored the geographical implications of rising female labor force participation, but primarily with the goal of increasing spatial mobility rather than challenging fundamental assumptions about gender roles. A decade later, feminist geographers had replaced the focus on the worktrip with a wider perspective on local labor markets, revealing that women's commuting patterns reflected endemic structures of inequality at both ends of the

¹For a recent and exhaustive review, see Blumen, O. (1994). "Gender differences in the journey to work." *Urban Geography* 15(3), 223-45; the best examples of this research are Madden, J.F. (1981). "Why women work close to home." *Urban Studies* 18, 181-94; and Hanson, S., and I. Johnston (1985). "Gender differences in worktrip length: Explanations and implications." *Urban Geography* 6, 193-219.

²The earliest reference to women's shorter worktrips is Pratt, E.E. (1911). *Industrial Causes of Congestion of Population in New York City*. New York: AMJ Press (cited in Madden, J.F. [1981], *op. cit.*). See also Leipmann, K.K. (1945). *The Journey to Work*. London: Kegan Trench and Truber and Co.; Wheeler, J.O. (1967). "Occupational status and work-trips: A minimum distance approach." *Social Forces* 45, 508-15; and Chapin, F.S., Jr. (1974). *Human Activity Patterns in the City*. New York: John Wiley & Sons.

³Seagert, S. (1981). "Masculine cities and feminine suburbs: Polarized ideas, contrasting realities." In Stimpson, C.R., et al., eds., *Women and the American City*. Chicago: University of Chicago Press, 93 - 108. Hanson, S., and G. Pratt. (1988). "Reconceptualizing the links between home and work in urban geography." *Economic Geography* 64, 299-321.

work journey. At the workplace, women's shorter worktrips reflected their lower incomes and their segregation into low-status, low-paying jobs that failed to justify lengthy commutes. Thus without adjustment of gender-based wage disparities (and a corresponding lengthening of women's commutes) rising female labor force participation might accelerate the decentralization of employment or stimulate a recentralization of residences.⁴ At the residence, the shorter worktrips of married women were linked to an enduring gender division of labor within the household, leading women to accept local employment in order to balance the time and space constraints of paid and domestic labor. Thus the prevalence of low-density single-family housing in American cities was said to reinforce existing structures of patriarchy by limiting the spatial range of women's opportunities in the labor market.⁵

While issues surrounding women's participation in the paid labor force have attracted increasing attention in recent years, geographical aspects of women and work remain terribly under-researched. Behavioral journey-to-work studies provide rich insights into the sociological factors contributing to women's more localized commuting patterns, but there is little understanding of how these relations vary *within* urban areas. If the link between women's income and commuting time varies between upper- and lower-middle class suburbs, for example, then locational shifts of employment growth will have locally-specific consequences for women in different parts of the metropolis. Similarly, structuralist research on local labor markets has uncovered evidence that women's constrained worktrips may induce firms reliant on low-wage female labor to locate accordingly, thus reinforcing occupational segregation and wage disparities. Yet analysts disagree on the appropriate local setting in which to test such hypotheses. Finally, the focus of recent feminist research in geography has shifted away from the description of empirically-observed spatial patterns, towards in-depth analysis of the processes of labor market segmentation. Thus relatively little is known about contemporary patterns, and many theories rely on data gathered during the 1970s and early 1980s.

⁴Madden, J.F., and M.J. White (1980). "Spatial implications of increases in the female labor force: A theoretical and empirical synthesis." *Land Economics* 56, 432 - 46.

⁵Hayden, D. (1984). *Redesigning the American Dream*. New York: W.W. Norton.

This study is an examination of gender divisions within local labor markets, focusing on the employment and journey-to-work characteristics of men and women in the Minneapolis-St. Paul Metropolitan Area in 1990. My purposes are twofold. First, I seek to determine whether labor market segmentation by gender assumes spatial form. There are a number of reasons to expect such patterns, and indeed the few studies to investigate this question have revealed the existence of highly localized labor markets. Second, I wish to evaluate the geographical variation of gender differences in worktrip length. Again, there are several reasons to expect that the well-documented gender gap in work travel is not constant across the metropolitan settlement fabric. I seek to examine the nature of this variation, and to explore the factors responsible for such patterns.

Overview and Findings of the Study

To keep the analysis tractable, I limit the study to married-couple, dual-earner households. This limitation excludes significant categories of working women, but it provides two important advantages over an analysis of the workforce as a whole. First, it permits a clear focus on gender differences in the geographical structure of local labor markets, since almost all husbands and wives share an identical residential distribution. Many commuting studies have failed to distinguish between the separate effects of a) the spatial distribution of residences, and b) the location of employment opportunities, in generating the observed gap between men's and women's worktrips. Second, the approach directly confronts contemporary debates on the theoretical implications of women's participation in the paid labor force. The dual-earner family lies at the center of debates between feminists who argue that gender constitutes an important axis of social stratification, and mainstream theorists who hold that class analysis is concerned with differences *between* rather than *within* families. This study examines how spatial factors might help to reinforce gender divisions in the workforce, thus perpetuating the different labor-market experiences of husbands and wives in dual-earner families.

In Chapter 2, I review the prominent contributions to the geographical literature on gender and local labor markets. Despite considerable advances within the last decade, geographical research on local labor markets remains hampered by a dichotomy between predominantly theoretical research on labor market segmentation (exemplified by "local labor market" studies) and systematic empirical work (dominated by behavioral "journey-to-work" studies). As a consequence, the

spatial configuration of local labor markets has been interpreted in contradictory ways. On the one hand, most journey-to-work studies and land-rent models continue to treat the length of the work journey as the spatial outcome of rational, utility-maximizing behavior on the part of individual travelers. On the other hand, geographers investigating labor market segmentation typically interpret the work journey as the outcome of a more structured and constrained process, by which the locational decisions of firms reinforce social and spatial divisions in the workforce. I argue that geographical research on local labor markets holds the potential to overcome several longstanding dichotomies within urban research, but that systematic and extensive empirical work is necessary to adjudicate competing theoretical claims. In particular, I argue that it is necessary to document the relations between socioeconomic variables and labor market outcomes at a fine spatial scale within the metropolis.

I describe the data and methods used for the study in Chapter 3. In line with the exploratory nature of my research questions, I rely on cartographic and statistical analysis of large-sample data collected by public agencies. Unfortunately, such sources typically are organized either by place of residence or by place of work--while my focus requires detailed social and spatial information at *both* ends of the work journey. Accordingly, I draw on three different data sets, each with distinct advantages and limitations.

First, I rely on the Public-Use Microdata Sample (PUMS) files of the U.S. Census of Population and Housing for detailed labor force and socioeconomic information. The PUMS files provide stratified, random samples of all responses to the long-form questionnaire of the decennial census, permitting unparalleled scrutiny of relationships at the individual and household level. The PUMS include only limited locational information, however, and suffer from a problematic measurement of the work journey.

Second, I obtain detailed locational data on commuting patterns from the Travel Behavior Inventory (TBI) assembled by the Metropolitan Council of the Twin Cities. Designed to help transportation planners forecast travel demand and allocate transport investments, the TBI supplies a wealth of information on individual travel patterns, including trip purpose, timing, mode, and location of origin and destination. To attain a high level of geographic specificity, however, the

TBI sacrifices sample size and includes few socioeconomic variables (complicating attempts to identify married-couple, dual-earner households).

Third, I use the Census Transportation Planning Package (CTPP) to examine the residential and workplace locations of selected segments of the labor force. Provided by the Census Bureau to assist in economic development and transportation planning efforts, the CTPP is a special summary tabulation of the decennial census prepared according to the unique geographic specifications defined by each metropolitan planning agency requesting the data. This package is an extraordinarily rich source of information on the location of workers and jobs, providing tabulations at a resolution finer than that of the census tract. Unfortunately, the CTPP provides tabulations only for broad industry and occupation groups, and includes only a limited number of socioeconomic measures (again, making it impossible to identify married-couple families).

I use three methods to analyze these data. First, I use cartographic analysis to examine fine-grained spatial variations in commuting patterns for different segments of the workforce. While recent literature contains a rich assortment of spatial metaphors--feminist and poststructuralist works describe a 'topography of patriarchy' and construct 'maps of meaning' of gender--there have been few systematic attempts to map gender relations in the traditional sense. One goal of this study is to document the manner in which gender divisions of wage labor may be observed at a fine spatial scale within the city. Second, I rely on standard analysis-of-variance (ANOVA) procedures to evaluate alternative socioeconomic measures related to worktrip length, and to analyze the geographical pattern of these relations. This approach is by far the most common way of evaluating gender differences in commuting patterns, facilitating the comparability of this study with previous research. Finally, I employ a multivariate statistical approach to explore the quantitative links between socioeconomic characteristics and the work journey. I use linear structural relations (LISREL) methodology, a technique used widely in sociology and other behavioral sciences which has recently gained increased attention from geographers. Also known as covariance structure models, LISREL combines the analytical flexibility of factor analysis, causal path modeling, and multiple linear regression while retaining many of the familiar assumptions and significance testing procedures of the general linear model.

In Chapter 4 I describe the local context for the study. The Minneapolis-St. Paul region offers a rare opportunity to analyze several facets of the interdependency among gender, social class, and the formation of localized labor markets. First, the region has a long history of female labor force participation, inviting an evaluation of the durability of labor-market segmentation over time. Minnesota's economic structure and social composition have produced the nation's highest female labor force participation rate, and recent restructuring of the Twin Cities economy has continued to draw married women from a broad spectrum of the middle class into the workforce. The area is also remarkably homogeneous along racial and ethnic lines, permitting a clear focus on gender issues. Second, the Twin Cities typifies many of the idealized features of conventional urban models. Despite its dual-city structure, the region exemplifies the stereotype of the classical North American metropolis: high-density downtown cores ringed by low-density suburban sprawl in all directions, with clearly-observable remnants of concentric zonal variations in housing characteristics and radial sectors differentiated by socioeconomic status. Together with the size and economic diversification of the region, these features make it particularly well-suited to an analysis of labor market segmentation across and within different suburban areas.

Chapters 5 and 6 form the heart of the analysis and results of the study. Chapter 5 is devoted to an analysis of the geographical structure of local labor markets, focusing on gender differences in the distribution of employment opportunities. Three main findings stand out from the analysis. First, when analyzed in the aggregate, spatial differences in commuting patterns differ only slightly between husbands and wives in dual-earner households. Gender-specific commuting flows are not clearly observable at a broad, metropolitan-wide scale, but carve out distinct labor-sheds at a relatively fine spatial resolution. The share of wives commuting to central-city office jobs, for example, varies substantially across suburban areas, undermining the validity of the central city/suburb dichotomy used in most journey-to-work studies. Second, women's shorter commutes with respect to men's correlates with important spatial variations in the local availability of suitable employment opportunities. For the workforce as a whole, the spatial distribution of jobs in all occupations and industries differs substantially by gender. In most categories, women's employment is comparatively dispersed across the urban fabric, while men tend to work in a smaller number of employment concentrations. Moreover, the spatial expression of occupational and industrial

divisions of labor is gender-specific, with the distribution of men's employment conforming most closely to classical theories of urban socio-spatial structure. These findings provide strong evidence in support of recent feminist arguments that posit a significant spatial component to labor market segmentation. Finally, spatial variations in labor demand and labor supply are associated with striking gender differences in earnings. In all parts of the metropolis, average annual earnings of wives in dual-earner households fall short of those of husbands. Yet wives' earnings vary significantly by place of work, while men's wages are comparatively constant across the urban fabric. Even when broken down by occupation and industry, wives' wages exhibit persistent geographical variation, particularly in female-dominated white-collar work. The spatial variation of husbands' earnings is much less pronounced, except for a limited number of technical and blue-collar occupations. These results amplify the findings of other studies of local labor markets, and suggest that the locational dependency between workers and firms exerts gender-specific effects on the opportunities available to individual workers.

In Chapter 6 I analyze the socioeconomic characteristics of dual-earner families in different parts of the metropolitan area, and I relate these contextual variations to the familiar gender gap in worktrip length. The results uncover striking levels of inequality within dual-earner households in all parts of the metropolis, reflecting historic and durable patterns of occupational sex segregation and wage differentials. Wives remain disproportionately concentrated in low-status administrative support and service occupations, and part-time work status and intermittent labor-force participation combine to limit their earnings to an average of half those of their husbands. These patterns correlate with the work journey in locally-specific ways, however, signifying that the spatial configuration of local labor markets relates to common behavioral explanations in a contingent and varied manner. Across all areas, women's shorter commutes are associated with their greater reliance on part-time work and their lower incomes, but other common explanations (family structure, household income, and occupational class) exhibit significant effects only in selected parts of the metropolitan area. Furthermore, the magnitude of the gender gap and income differentials in dual-earner families depends on the geographical sampling frame chosen. Samples of employed wives drawn from workplaces in upscale, densely-developed suburban labor markets are likely to uncover wide intrahousehold disparities in earnings, with little corresponding gender gap in commuting time. Samples of employed wives drawn

from workplaces in diffuse, working-class suburban labor markets, however, will typically yield significant gender differences in earnings accompanied by large differentials in travel time between husbands and wives. The geographically-variable link between behavioral correlates and the gender gap in worktrip length suggests that previous studies of the 'spatial entrapment' of working women may benefit from comparative work at an intraurban scale.

I undertake a more rigorous statistical analysis of worktrip length in the second half of Chapter 6. Simple bivariate correlations among socioeconomic indicators and the work journey confirm striking differences in the social and spatial configuration of local labor markets. For husbands in dual-earner households, the duration of the work journey is virtually unrelated to socioeconomic status, whether measured in terms of individual or household income, education, or occupational prestige. In contrast, the data suggest a weak but consistent link between travel time and status for wives. This result provides corroborating evidence for the argument that travel decisions depend not only on individual tradeoffs, but also on decisions made *within* the household. The linear structural relations (LISREL) models amplify these findings. Regionwide, occupational segregation and industrial segmentation correlate with women's more localized commutes, even when controlling for wage rates. Yet the salient relations fluctuate across different parts of the metropolitan area. Occupational sex segregation carries a significant earnings penalties in most parts of the region; but it is accompanied by shorter commutes only in diffuse and working-class suburban labor markets.

Chapter 7 summarizes the main findings and implications of the study. While many of the results support the broad outlines of previous research, some of the findings diverge from consensus views of women's labor force participation. The geographical structure of local labor markets is highly variegated for men, in keeping with classical theories that projected men's occupational status onto the social geography of the city. Yet the link between socioeconomic status and the work journey, and the effect of location on earnings opportunities, is weak or non-existent for a broad segment of middle-class men. Several generations of metropolitan decentralization and increasing personal mobility have loosened the ties between affluence and spatial mobility--for men.

For employed wives, however, the spatial structure of local labor markets tells a different story. Owing to persistent divisions in the workforce, women remain confined to a small number of low-status, poorly-paid occupations and industries. The geographical distribution of these jobs, however, suggests that women from a broad spectrum of the urban residential mosaic share common experiences in labor-market segmentation. Nevertheless, location exerts significant and substantial effects on the earnings opportunities available to women, and the time- and space-requirements of domestic and paid employment make it difficult to justify distant employment without a premium in job security or earnings. The interplay of labor demand and labor supply comes together in locally unique ways, complicating the common attempt to interpret the length of the work journey in socio-spatial equity terms. Yet given the remarkable and persistent levels of wage disparities between men and women, gender-based disjunctures in spatial labor markets are likely to remain enduring features of the social geography of the North American city.

CHAPTER TWO
GENDER AND THE RELATIONSHIP BETWEEN HOME AND WORK

Introduction

The daily journey to work is one of the most closely scrutinized facets of the North American city, and attracts attention from analysts working in all research traditions of urban geography. In the last half-century geographers have undertaken thousands of studies to describe the geographical patterning of commuter flows within and between urban areas, and to document the travel behavior of various groups of workers.¹

Since the late 1950s social geographers have complemented the focus on the worktrip with efforts to use commuting patterns as indicators of broader social, economic, and spatial relations within the city. As the spatial expression of the link between home and work, the daily commute has been studied at both ends, by analysts of diverse theoretical stripes. Research grounded in neoclassical economics analyzes the role of individual trade-offs between residential amenities and transport costs in shaping urban spatial structure.² Marxist theories interpret the separation of residences and workplaces as one outcome of capitalism's need to fragment working-class solidarity, and to promote mass consumption of automobiles and suburban homes.³ Recently, feminist geographers drawing on segmented labor market theory have argued that the spatial interdependency between workers and firms is mediated by gender divisions in the workforce--thus differences in geographical access to employment both *reflect* and *reinforce* patterns of inequality in the labor market.⁴

¹By far the best summary of the important trends is Hanson, S., ed. (1986). *The Geography of Urban Transportation*. New York: Guilford Press.

²Alonso, W. (1965). *Location and Land Use*. Cambridge, MA: Harvard University Press; Muth, R.F. (1969). *Cities and Housing*. Chicago: University of Chicago Press.

³The broadest critique of the relations between housing and labor markets in urban capitalism is Harvey, D. (1973). *Social Justice and the City*. London: Edward Arnold. See also Harvey, D. (1985). *The Urbanization of Capital*. Oxford: Basil Blackwell. On the narrower issue of suburbanization, see Walker, R.A. (1981). "A theory of suburbanization: Capitalism and the construction of urban space in the United States." In Dear, M., and A. Scott, eds., *Urbanization and Urban Planning in Capitalist Society*. New York: Methuen, 383-429.

⁴Hanson, S., and G. Pratt (1992). "Dynamic dependencies: A geographic investigation of local labor markets." *Economic Geography* 68, 373-405; McLafferty, S., and V. Preston (1992). "Spatial mismatch and labor market segmentation for African-American and Latina women." *Economic Geography* 68, 406-31. For a concise review of recent structuralist and feminist research on commuting patterns, see Hodge,

With such a rich and varied research tradition, it is difficult to identify aspects of the work journey that can illuminate contemporary issues of theory and policy in any original fashion. Yet, at the risk of overgeneralizing, it is possible to discern two significant gaps in our understanding of the relations between home and work. First, an enduring dichotomy between empirical and theoretical research impedes our understanding of the role of gender in the geography of local labor markets. Structuralist and feminist works incorporate the link between home and work into broader interpretations of society, but a dearth of suitable empirical evidence plagues these theoretical arguments. Empirical research, meanwhile, remains dominated by behavioral analyses correlating individual commuting patterns with easily-observed socioeconomic variables--usually at a coarse geographic scale. In the limited scope of this study it is impossible to overcome this limitation, but it is important to acknowledge how it perpetuates a second problem.

In relating the work journey to various social and economic processes, many scholars interpret the length of the worktrip in a simplistic and linear fashion--either as the spatial expression of prestige, or as a sign of oppression. Consequently, our understanding suffers from contradictory interpretations of the spatial configuration of local labor markets, and analysts often disagree on the appropriate local setting in which to evaluate alternative theories. As the first phase of a research program to address these limitations, this study presents a detailed empirical analysis of relations between socioeconomic variables and labor market outcomes in different neighborhoods of the metropolis.

Beyond the Journey to Work

Scholars' longstanding interest in the daily work journey reflects the complexity of the phenomenon, as well as its substantial policy relevance. The intricate and dynamic webs of interaction connecting residences and workplaces continue to attract considerable attention from quantitative geographers, regional scientists, and transportation planners.⁵ In recent years, however, many

D.C. (1990). "Geography and the political economy of urban transportation." *Urban Geography* 11(1), 87-100.

⁵This research has been invigorated by the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), which is stimulating innovative work in travel demand modeling and land-use planning. See, e.g., Ferguson, E. (1994). "Recent advances in urban transportation planning methods, models, and research techniques." *Journal of Planning Education and Research* 13, 185-88.

geographers have become increasingly interested in the relation between the worktrip and broader processes operating at the residence and the workplace.

This shift in emphasis has been most pronounced in Marxist and feminist geographers' research, which has placed urban transportation in the context of the underlying social relations of urban growth in capitalist cities. For Marxists, the spatial separation of production (workplaces) from reproduction (residences) facilitates the displacement of working-class solidarity from the factory and the office to the neighborhood. Thus contradictions in the structure of capitalist accumulation (e.g., unemployment and poverty) often surface as neighborhood conflicts that serve to fracture potential class alliances against capital (e.g., fights over exclusionary zoning barring low-income housing from middle-class suburbs). This spatial configuration also promotes the smooth reproduction of the labor force (e.g., blue-collar neighborhoods tend to produce individuals likely to enter blue-collar work), while public-sector investment in transportation facilities prevents the separation of land uses from creating labor shortages and bidding up wage rates.⁶

Feminist urban research has been equally critical of the spatial separation of residences and workplaces. Initially, feminists interpreted this division as a means of keeping the costs of social reproduction--child-rearing, the preparation of meals, the maintenance of a suitable home environment--within the household and out of the formal realm of wages and salaries. As such, low-density suburban sprawl symbolized the relations between capitalism and patriarchy, with the separation of public and private spaces necessitating the oppression of women in order to conceal the inefficiencies of urban structure. The postwar growth pattern of North American cities--low-density suburbs filled with single-family homes remote from job centers--entailed increases in the time and effort required for household maintenance; but this inefficient pattern could endure as long as wives and mothers provided the necessary unpaid labor.⁷

⁶Harvey, D. (1985). "Class structure and the theory of residential differentiation." Chapter 5 in *The Urbanization of Capital*. Oxford: Basil Blackwell, 109-24; Feldman, M. (1977). "A contribution to the critique of urban political economy: The journey to work." *Antipode* 9, 30-50.

⁷See, e.g., Markusen, A.R. (1981). "City spatial structure, women's household work, and national urban policy." In Stimpson, C.R., et al., eds., *Women and the American City*. Chicago: University of Chicago Press, 20-41. Cowan, R.S. (1983). *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave*. New York: Basic Books.

This arrangement was stretched to its limits in the 1960s and 1970s, as economic and social changes drew women into the workforce in unprecedented numbers. Between 1960 and 1980, female labor force participation increased from 36 percent to 50 percent, with the most dramatic rise occurring among married women.⁸ By 1980, fewer than one in ten households conformed to the 'typical American family' consisting of a male breadwinner, female homemaker, and two children--yet much of the nation's existing housing stock had been designed on the assumption of a full-time housewife. Thus the flaws in American urban spatial structure surfaced in a variety of social and economic changes: families increasingly substituted purchased goods and services (e.g., fast-food, formal child care, etc.) for 'mother's love'; middle-class dual-earner families sought homes in the city to minimize time spent in the daily commute (gentrification); and scholars and journalists proclaimed a housing crisis as incomes fell short of what was needed to pay inflationary single-family home prices.⁹

The entry of women into the labor force accelerated a shift in feminist research, replacing the focus on women's oppression *within* the household with an emphasis on the conditions facing women in the labor market.¹⁰ Despite sweeping social and economic changes, women remained confined to a relatively small number of job types, stimulating widespread debate on the causes and implications of occupational sex segregation. Sociologists and labor economists showed that occupational segregation remained a durable feature of the American economy over the past century, declining only gradually by most measures.¹¹ In 1980,

⁸U.S. Bureau of the Census data, cited in Fitzsimmons, J.D. (1991). *Female Labor Force Participation Change in the Central United States, 1950-1980*. Unpublished Ph.D. Thesis. Minneapolis: University of Minnesota, Table 1.1 (p. 9) and Table 1.2 (p.10).

⁹Markusen, A.R. (1981), *op. cit.*; Hayden, D. (1984). *Redesigning the American Dream*. New York: W.W. Norton.

¹⁰This shift has been by no means complete or uncontested, and there is a considerable body of feminist theory on the interaction of gender relations in the domestic realm with those in public life. Sylvia Walby has traced the development of the relations between class stratification and gender relations. Walby, S. (1990). "Paid employment." Chapter 2 in *Theorizing Patriarchy*. Cambridge, MA: Basil Blackwell, 25-60; see also Walby, S. (1986). "Theories of gender inequality: A critique." Chapter 2 in *Patriarchy at Work*. Minneapolis: University of Minnesota Press, 5-49.

¹¹Paula England analyzed a variety of measures depicting occupational sex segregation over the first three quarters of the twentieth century, and concluded that segregation declined between 10 and 20 percent over the period. The most dramatic decline occurred during the 1940s as wartime production drew women into nontraditional work, but a pronounced increase in segregation followed in the 1950s. The 1970s brought "negligible change." England, P. (1981). "Assessing trends in occupational sex segregation, 1900-1976." In Berg, I., ed., *Sociological Perspectives on Labor Markets*. New York: Academic Press, 273-95.

approximately half of all workers were engaged in occupations in which at least four-fifths of the employees were of one sex.¹² Similarly, women consistently earned less than men: women employed full-time, year-round garner fully one-third less than their male counterparts.¹³

These trends have stimulated a torrent of geographical research on women's employment in the last fifteen years, including dozens of studies of gender differences in commuting patterns. Much of this research consists of statistical analysis of worktrip patterns and behavioral variables hypothesized to account for men's and women's commutes. Studies find that women tend to work closer to home, whether proximity is measured in terms of travel time,¹⁴ airline distance,¹⁵ or road distance.¹⁶ This 'gender gap' typically ranges between 15 percent and 25 percent, although in some suburban settings men's worktrips exceed women's by 40 percent or more.¹⁷ Analysts attribute these findings to income disparities,¹⁸ occupational segregation,¹⁹ and to the constrained time-budgets of married women balancing paid employment with household responsibilities.²⁰

In the main, behavioral research explains the formation of local labor markets in terms of individual choice. Analysts recognize that structural features of the labor market (occupational segregation and wage differences) contribute to observed differences in commuting. Yet these variables are often treated as exogenous, and women's commutes are described in terms of choices among a limited range of alternatives. Thus gender differences in the structure of local labor

¹²Reskin, B., and H. Hartmann (1986). *Men's Work, Women's Work: Sex Segregation on the Job*. Washington, D.C.: National Academy Press, p. 7.

¹³Evans, S.M., and B.J. Nelson (1989). *Wage Justice: Comparable Worth and the Paradox of Technocratic Reform*. Chicago: University of Chicago Press, p. 16.

¹⁴Hanson, S., and I. Johnston (1985). "Gender differences in worktrip length: Explanations and implications." *Urban Geography* 6, 193-219.

¹⁵Manning, I. (1978). *The Journey to Work*. Boston: Allen and Unwin.

¹⁶Villeneuve, P., and D. Rose (1988). "Gender and the separation of employment from home in metropolitan Montreal." *Urban Geography* 9, 155-79.

¹⁷See Blumen, O. (1994). "Gender differences in the journey to work." *Urban Geography* 15(3), 223-45. Most studies suggest that gender differences in worktrip length are greater in distance than in travel time.

¹⁸Hanson, S., and I. Johnston (1985), *op. cit.*

¹⁹Rutherford, B.M., and G.R. Wekerle (1988). "Captive rider, captive labor: Spatial constraints and women's employment." *Urban Geography* 9, 116-37.

²⁰In a recent and exhaustive review of the literature, Orna Blumen concluded that "[a]lmost all of the studies...note that the dual role of women is a major factor in their shorter commuting patterns." Blumen, O. (1994), *op. cit.*, p. 228.

markets (particularly among married, suburban women) reflect rational, utility-maximizing behavior when viewed in the appropriate social context. Married women seek out nearby jobs to minimize time spent out of the home, and they are reluctant to devote a great deal to the job search, given their intermittent labor force participation.

With the ascendance of critical social theory in human geography during the 1980s, scholars have begun to probe beyond the limited purview of these behavioral interpretations. Marxist and feminist geographers draw on ideas from industrial geography and segmented labor market theory (SLM) to interpret differences in commuting patterns as the outcome of a structured and constrained process.

SLM theory is a now widely-accepted challenge to the behavioral interpretation of labor markets prevalent in neoclassical economics.²¹ Neoclassical theorists see gender, racial, and other divisions in the workforce as the residue of previous--and/or economically irrational--microeconomic behavior. Given the smooth and free operation of the market for workers, neoclassical theorists predict the erosion of all earnings differentials, except for those reflecting the achieved productivity of different groups of workers. Thus gender- and race-based wage gaps will, over time, narrow such that workers of equal skill and productivity garner similar earnings.

SLM theorists challenge this view, and portray divisions in the labor market as relatively rigid and self-reinforcing. In the main, labor markets in contemporary capitalist economies are divided into two broad segments. The primary labor market is typically protected from the fluctuations of supply and demand, and incumbents enjoy comparatively high earnings, good working conditions, and a high degree of job security. The secondary labor market is much more subject to the exigencies of market forces, and jobs in this segment are poorly-paid, less secure, and involve comparatively poor working conditions.

²¹The literature on segmented labor markets is vast and has grown rapidly in the last two decades. The earliest treatments of internal and segmented labor markets are: Doeringer, P., and M. Piore (1971). *Internal Labor Markets and Manpower Analysis*. Lexington, MA: D.C. Heath; Gordon, D., R. Edwards, and M. Reich (1982). *Segmented Work, Divided Workers: The Historical Transformation of Labor in the U.S.* Cambridge: Cambridge University Press.

SLM theorists have studied the manner in which the dynamics of the labor market tend to reinforce the divisions between primary and secondary employment, and some analysts subdivide the categories further in order to illuminate finer distinctions in the contrasting opportunities available in different segments. Collectively, employers and labor unions both contribute to processes of labor-market segmentation, through the use of internal career ladders, certification procedures or well-defined qualification requirements, and other such "ports of entry." These portals restrict most workers' access to the primary segment, and selected groups among white men historically have been alone in gaining entry to these coveted positions. Entry and dismissal are easy and frequent in the secondary segment, however, and women and ethnic and racial minorities remain trapped in these jobs, unable to break into primary employment. In sum, SLM theorists see divisions in the labor force not as a temporary market imperfection, but as the outcome of enduring and self-perpetuating processes.

Spatial variants of SLM theory correlate differences in the spatial structure of local labor markets with firms' labor recruitment strategies, and with the localized nature of most workers' job-search networks. Initially, scholars focused on the locational strategies of firms seeking to minimize labor costs. Firms could keep wage rates in check with a variety of strategies: relocating facilities, separating different stages of the production process, restructuring the arrangements governing employment, or seeking out low-wage segments of the labor force (e.g. women and minorities). In practice, the particular combination of strategies employed depends on local conditions and historical circumstances, but the net result is that firms' locational behavior tends to exploit and reinforce social and spatial divisions among different groups of workers.²²

These new approaches enrich the study of local labor markets, but our understanding of the phenomena remains severely limited. First, the behavioral focus on the individual worker has too often been traded for a narrow focus on the firm or the industry, replacing one type of determinism with another. Susan Hanson and Geraldine Pratt, for instance, fault industrial geographers for giving

²²The best examples of geographical work on industrial restructuring are: Massey, D. (1984). *Spatial Divisions of Labor*. London: Methuen; Scott, A.J. (1988). *Metropolis: From the Division of Labor to Urban Form*. Berkeley: University of California Press; see also Clark, G. (1981). "The employment relation and spatial division of labor: A hypothesis." *Annals of the Association of American Geographers* 71(3), 412-24.

"priority to production, through arguments that the existence and location of certain types of labor are called into being by the presence of certain types of industry...or that employers simply locate their enterprises to tap labor from a particular place-based community."²³ Second, much of the work on labor market segmentation remains theoretical, perpetuating a dichotomy between empirical and theoretical research. Empirical work is dominated by behavioral studies correlating individuals' travel patterns with their socioeconomic characteristics, while theories of the location of firms and industries prevail in structuralist accounts. Finally, the spatial scale of many empirical studies impedes the evaluation of theoretical claims with appropriate geographical data. On the one hand, most analysts opt for a macro-scale approach, studying spatial divisions of labor at the regional level,²⁴ community responses to global forces at the city-region level,²⁵ or behavioral patterns at the national or metropolitan area level.²⁶ Few studies examine the manner in which behavioral correlates of the work journey vary *within* metropolitan areas, or how gender segmentation of the labor force is manifested at the neighborhood level.²⁷ On the other hand, feminist geographers in recent years have studied spatial constraints on women's employment at an extremely fine scale, relying on small samples drawn from selected neighborhoods and firms.²⁸ Thus we know relatively little about the intrametropolitan variation of women's commuting patterns *vis-a-vis* men's, and analysts disagree on the appropriate local setting from which to draw generalizations.

Distance in Urban Transportation Research

These limitations complicate efforts to interpret the now-familiar gap between men's and women's commuting distances, despite a proliferation of studies over the past decade. To be sure, scholars universally acknowledge that there is no *simple* relation between individuals' characteristics and their travel behavior, or between firms' locational behavior and spatial patterns of labor market

²³Hanson, S., and G. Pratt (1992). "Dynamic dependencies," *op. cit.*, p. 374. See also Hanson, S., and G. Pratt (1988). "Reconceptualizing the links between home and work in urban geography." *Economic Geography* 64, 299-321.

²⁴e.g., Massey, D. (1984), *op. cit.*

²⁵e.g., Cooke, P., ed. (1984). *Localities: The Changing Face of Urban Britain*. London: Unwin Hyman.

²⁶e.g., Madden, J. (1981). "Why women work closer to home." *Urban Studies* 18, 181-94.

²⁷The single best exception is Hanson, S., and G. Pratt (1988). "Spatial dimensions of the gender division of labor in a local labor market." *Urban Geography* 9, 180-202.

²⁸e.g., England, K.V.L. (1993). "Suburban pink-collar ghettos: The spatial entrapment of women?" *Annals of the Association of American Geographers* 83, 225-42.

segmentation. Yet many researchers explicitly seek to interpret the geographical configuration of local labor markets in terms of broad social relations. In attempting to do this, however, analysts highlight an implicit dichotomy between two opposing interpretations of distance in urban transportation research. On the one hand, most behavioral and land-rent models continue to treat the length of the work journey as the spatial expression of prestige, with affluent workers willingly trading travel time for residential amenities at the urban fringe; other researchers interpret lengthy commutes as a manifestation of oppression, particularly when behavioral assumptions regarding free choice and perfect information are relaxed.

Distance as Prestige

The first--and most influential--interpretation of distance portrays the spatial separation of home and work as a sign of affluence or prestige. Overcoming the distance between the residence and the workplace requires variable expenditures (commuting costs and travel time) and, for the vast majority of American workers, a substantial capital investment as well (the purchase of a private automobile). In order to minimize these costs, workers of modest means seek out homes close to their place of work, thus crowding into dense working-class neighborhoods and bidding up the per-unit price of land. More affluent workers, in contrast, are better able to overcome the "daily friction of distance," and so they may search for more spacious housing at sites distant from job concentrations. Assuming that employment in an urban area remains centralized, a social patterning emerges in which socioeconomic status rises with distance from the city center, creating the apparent paradox of the wealthiest workers living on the cheapest land.²⁹

Distance as Oppression

A second interpretation of commuting distance was formalized in the late 1960s, and became an important point of departure for researchers interested in the social equity effects of transport policy. This interpretation challenges the sole emphasis on individuals' choices among various housing and employment locations. The spatial distribution of suitable employment opportunities constrains each worker's available options, and any changes in this pattern necessarily entail corresponding limits on workers' evaluation of alternatives. To adjust to a plant relocation, for example, workers have three alternatives: they may move their place

²⁹Alonso, W. (1964), *op. cit.*; Muth, R.F. (1969), *op. cit.*

of residence accordingly, search for a job closer to their current home, or shoulder the increased travel costs required to reach the firm's new location. Clearly, each of these alternatives represents an increased burden on workers that is the direct result of the firm's locational decision.

The first coherent synthesis of these relationships was John Kain's celebrated "spatial mismatch" hypothesis, an enormously influential work which served as the catalyst for hundreds of studies in academic and public policy outlets over the subsequent three decades.³⁰ Kain argued that pervasive racial discrimination in the housing market effectively barred African-American workers from using residential relocation to cope with structural changes in urban labor markets. When transport costs, increasing congestion, and other factors led to a massive decentralization of manufacturing away from the cores of metropolitan regions, African-Americans were left spatially isolated from these jobs, many of which had provided comparatively high wages and required little formal education. These workers were left either with poorly-paying, temporary local jobs, or additional travel costs required to reach suburban employment.

Industrial location theory in the 1980s refined the notion of spatial inequity implicit in Kain's work. Given that workers must bear the cost of the daily work journey, aggregate commuting costs for the labor force do not confront employers in exactly the same manner as wages, which exert a direct downward pressure on profits. Yet commuting costs can intersect with labor demand and labor supply to exert marginal effects on the wage bill faced by employers. If a firm locates to a suburban site so as to maximize access to inputs and markets, for example, it may be forced to offer a higher local wage so as to attract workers from a broader geographic area (given lower population densities at the suburban site). Under these circumstances, employers face pressures to exploit existing social divisions in the workforce to keep labor costs in check.³¹ According to this argument, then, commuting distance may be interpreted in terms of firms' labor needs, with workers' oppression signified either by short commutes (e.g., women traveling from nearby suburban neighborhoods) or long commutes (e.g., racial or ethnic minorities journeying from inner-city districts).

³⁰Kain, J.F. (1968). "Housing segregation, negro employment, and metropolitan decentralization." *Quarterly Journal of Economics* 82, 175-97.

³¹Scott, A.J. (1988), *op. cit.*, Chapter 5.

Gender Differences in the Work Journey

The literature on gender differences in urban travel flourished beginning in the mid-1970s, and includes examples of research that lends support to both of these interpretations of commuting distance. Most studies have focused on middle-class white women in North American cities, and so the empirical finding of women's shorter worktrips typically has been incorporated into a 'spatial entrapment' thesis. According to this theory, patriarchy within the domestic sphere forces women to narrow the spatial range of their daily routines to balance paid employment with work in the home, while poorly-developed transport networks prevent suburban women from reaching well-paying jobs at distant centers. These severe spatial constraints then become an attractive locational factor for suburbanizing firms seeking out low-cost labor. In short, women's commuting patterns both reflect and reinforce gender oppression, as firms locate so as to secure a docile "pink-collar" workforce -- white, middle-class, non-unionized housewives who regard their own employment as secondary to the household's income, thereby accepting lower wages.³²

Other studies, however, find that many women endure commutes that do not appear justified on economic considerations. In contrast to their male counterparts, women seem unable to attain higher wages by lengthening the work journey.³³ Moreover, the finding of women's shorter worktrips does not apply in all settings,³⁴ and studies demonstrate that minority women usually commute farther than white women.³⁵ Thus the gender gap in worktrip length appears to be mediated by other axes of labor-market segmentation (and race), locational decisions negotiated within the household (e.g., choosing a residence according to the husbands' criteria), and local context (e.g., the availability of suitable job

³²Hanson, S., and G. Pratt (1988). "Spatial dimensions..." *op. cit.*; Nelson, K. (1986). "Labor demand, labor supply, and the suburbanization of low-wage office work." In Scott, A.J., and M. Storper, eds., *Production, Work, Territory*. Boston: Allen and Unwin, 149-71.

³³In a study set in suburban Toronto, Rutherford and Wekerle found that women's income gains to longer worktrips fell short of the wage premium accruing to men. Rutherford, B.M., and G.R. Wekerle (1988), *op. cit.*

³⁴Maraffa, T.A., and S.R. Brooker-Gross (1984). "Aspects of the journey-to-work within a small city laborshed." *Urban Geography* 5, 178-86; Brooker-Gross, S.R., and T.A. Maraffa (1985). "Commuting distance and gender among non-metropolitan university employees." *Professional Geographer* 37, 303-09.

³⁵McLafferty, S., and V. Preston (1991). "Gender, race, and commuting among service-sector workers." *Professional Geographer* 43, 1-15.

opportunities near affordable housing). For women in many circumstances, long work journeys signify oppression, not prestige.

Under what circumstances, and for which groups, can the length of the work journey serve as an observable indicator of oppression or prestige? The level of confusion on this question is poignantly illustrated by a recent exchange between England and Hanson and Pratt. In a meticulous study of the commuting patterns of female clerical workers in Columbus, OH, England found little support for the spatial entrapment thesis, which she faulted as a gross overgeneralization. Her surveys suggested that some married mothers actually commuted longer than single, childless women: "women conventionally viewed as being the *most* spatially entrapped ... actually had *longer* commutes than categories of women who ... should have been the least spatially entrapped."³⁶

Hanson and Pratt questioned England's conclusions on methodological grounds: her sample represented clerical workers living in upper-middle class suburbs, but the spatial entrapment thesis grew out of studies of large, randomly-selected samples depicting women from a broad range of the class structure. Hanson and Pratt argued that England's data were not suited to a fair evaluation of the spatial entrapment thesis, which "applies most distinctly to white lower- and middle-class women," *not* to the workers England studied.³⁷

England maintained that her data were in fact "biased *in favor* of the spatial-entrapment thesis," since her sample represented "the preferred pink-collar labor supply" for suburbanizing offices.³⁸ England reiterated her interpretation of women's commuting as "an effort to juggle a multiplicity of overlapping and often contradictory roles and spatial factors," and argued that "a short journey-to-work is not necessarily the only possible spatial outcome of this."³⁹

This exchange underscored the contradictions between the two interpretations of space in urban transportation research. On the one hand, Hanson

³⁶England, K. (1993), *op. cit.*, p. 240, emphasis added.

³⁷Hanson, S., and G. Pratt (1994). "On suburban pink collar ghettos: The spatial entrapment of women? by Kim England." *Annals of the Association of American Geographers* 84(3), p. 501.

³⁸England, K. (1994). "Reply to Susan Hanson and Geraldine Pratt." *Annals of the Association of American Geographers* 84(3), p. 503, emphasis in original.

³⁹England, K. (1993), *op. cit.*, p. 237.

and Pratt defended the political and theoretical value of an explanation relating "entrapment" to women's oppression, but England's findings seemed to imply the opposite. England argued:

Conventionally, a short commute has been basically viewed as a reflection of the oppression of women. Oppression (like capitalism) is metamorphic and so is constantly changing shape. Simply because some women have lengthy commutes does not mean that the oppression of women has been eliminated; indeed they may feel even more oppressed.⁴⁰

Recent work on local labor markets has begun to overcome many of the limitations of previous interpretations of the work journey. In ongoing research on neighborhoods in Worcester, MA, Susan Hanson and Geraldine Pratt have drawn on a variety of sources to document the "dynamic dependencies" between workers and firms that both reflect and reinforce spatial aspects of gender, racial, and ethnic divisions in the labor force.⁴¹ In their locational decisions, employers "prove to be astute social geographers," locating so as to ensure access to a labor supply perceived to have the desired skills and qualifications; in the process, firms develop rich ties to local communities, reinforcing their reliance on local labor markets they helped to create.⁴² Workers, on the other hand, contribute to this pattern through their preference for short work journeys, their reliance on informal job-search networks, and their residential rootedness. Thus the relations between individual choice, labor market segmentation, and spatial constraints interact to produce fine-grained variations in labor market outcomes across the metropolis.

Hanson and Pratt have done much to advance our understanding of the geographical dynamics by which individuals balance home and work. Yet few comparable studies exist outside Worcester, and comparability is further hampered by fashionable methodological emphases. Many feminist geographers eschew quantitative analysis in favor of more qualitative approaches, drawing on interviews with workers and employers in selected neighborhoods within an urban

⁴⁰England, K. (1994), *op. cit.*, p. 504.

⁴¹Hanson, S., and G. Pratt (1992), "Dynamic dependencies," *op. cit.*; See also Pratt, G., and S. Hanson (1994). "Geography and the construction of difference." *Gender, Place, and Culture* 1(1), 5-29.

⁴²Hanson, S., and G. Pratt (1992), "Dynamic dependencies," *op. cit.*, p. 373.

area. While qualitative studies provide insights that are suppressed in a purely quantitative analysis, the two perspectives are fundamentally complementary.

One of my goals in this study is to shed light on some of the broader patterns behind the contradictory findings of qualitative case studies. In Chapter 6 I present a simple tabulation that demonstrates the effect of spatial sampling strategies on the magnitude of gender differences in worktrip length, and the degree to which the gender gap relates to wage disparities.

Gender and Theories of Residential Differentiation

By fixing in space the link between home and work, the daily commute provides an insightful (albeit limited) perspective on broad social and spatial divisions in the North American city. In particular, commuting studies must examine not only the socioeconomic characteristics of individual travelers, but should also analyze the varied character of neighborhoods and employment districts that constitute one facet of the opportunity structure facing individual actors. To examine how gender mediates this set of relations, I examine recent feminist critiques of theories of residential differentiation.

Conventional theories of residential differentiation explain the emergence of homogenous neighborhoods in terms of an organic sorting process, whereby "people of similar socioeconomic circumstances are attracted to common areas."⁴³ While explanations following this logic still underpin a great deal of urban research, two fundamental flaws in the classical theories have prompted considerable debate in urban sociology and geography. The first critique deals with the taken-for-granted manner in which individual actors are assumed to express their choices of where to live and work. David Harvey has led the structuralist critique of this assumption, and in ongoing work he and others have elaborated a theory that has come to be known as the "social reproduction of class" theory of residential differentiation.⁴⁴

⁴³Bollens, J.C., and H.J. Schmandt (1965). *The Metropolis*. New York: Harper & Row, p. 90. The seminal works in classical theories of residential differentiation are in social area analysis and factorial ecology, which in turn have deep roots in the Chicago School of sociology. Shevky, E., and W. Bell (1955). *Social Area Analysis*. Stanford: Stanford University Press. Rees, P.H. (1970). "The factorial ecology of metropolitan Chicago." In Berry, B.J.L., and F.E. Horton, eds., *Geographic Perspectives on Urban Systems*. Englewood Cliffs, NJ: Prentice-Hall. Timms, D. (1971). *The Urban Mosaic*. Cambridge: Cambridge University Press.

⁴⁴Harvey, D. (1985). *op. cit.*; Scott, A.J. (1986). "Industrialization and urbanization: A geographical agenda." *Annals of the Association of American Geographers* 76, 25-37; Harris, R. (1984). "Residential

This literature challenges the classical notion that individual choices yield an aggregate, ecological process by which the city moves steadily toward a state of social and spatial equilibrium. Harvey and others emphasize the conflictual nature of social relations in the American city, adapting Marxian conceptions of social class to the context of American urban capitalism. While there are a number of forces mediating social and economic relations in Western cities, Harvey and others argue that the primary force dividing *social* groups is that rooted in the conflictual *economic* relation between capital and labor.

Residential differentiation, then, is primarily a process of class differentiation, in which workplace-based production relations are expressed in the city's social geography. Power relations in the system of production (the workplace) divide workers into groups with varying levels of access to material resources, and also result in contrasting norms and values--which are then expressed in the realm of consumption (the residence). According to this logic, people of similar means live near one another not primarily because of their rational, individual choices, but 1) as a result of their differential levels of control of property and/or wealth, and 2) because of the consumption norms and values they have come to adopt from their position in the class structure. In turn the residential neighborhood serves as the primary source of socialization, transferring norms, values, and allegiances from one generation to the next. In this way, working-class neighborhoods tend to produce individuals with working-class values--thereby reproducing existing spatial divisions in the city's social geography, and often supplanting class allegiance with neighborhood and community identity. In short, homogenous residential areas help to ease the smooth reproduction of class relations necessary for the survival of urban capitalism.

Feminists increasingly challenged many of the deterministic variants of structuralist theory in the 1980s, and in urban geography Susan Hanson and Geraldine Pratt led the attempt to overcome the limitations of the social reproduction thesis.⁴⁵ For Hanson and Pratt, the ideas of Harvey and others relied on an outdated notion of social class, which ignored the realities of women's labor-

segregation and class formation in the capitalist city: A review and directions for research." *Progress in Human Geography* 18, 26-49.

⁴⁵The most cogent expression of their reaction to the social reproduction thesis is Pratt, G., and S. Hanson (1988). "Gender, Class, and Space." *Environment and Planning D: Society and Space* 6, 15-35.

force participation. While it may be reasonable to trace the social geography of the city to a process of class differentiation, such logic immediately raises the question of how class is defined, and how gender relates to social class. In particular, the social reproduction argument falters if married women who work outside the home--the group with the highest rates of increase in labor force participation over the past three decades--cannot be classified according to their husbands' occupational status. Hanson and Pratt expose the empirical fallacy of this expectation, showing that women face a high degree of occupational sex segregation that confines most of the female workforce to lower-status, low-paying jobs. This experience is shared by women in poor and working-class neighborhoods, and by women in more affluent white-collar residential areas as well. As a consequence, the social and spatial expression of class may be said to differ fundamentally among married couples. Most married women have little control over the conditions or product of their own labor in the workplace, placing them in the working-class according to most Marxian theories. They may have some autonomy over parts of their labor in the household, but typically bear the primary burden of housework and child care. And still many of these women reside in neighborhoods thought of as middle- or upper-middle class when viewed through the lens of male occupational status. In short, women may occupy contradictory class locations not only socially, but also spatially.

To my knowledge, Hanson and Pratt's work over the past decade is the only detailed empirical examination of this theoretical argument. In this study I perform a simple analysis of the spatial patterns that appear most fundamental to the social reproduction thesis. In Chapter 5 I show that mapping spatial dimensions of the division of labor among men provides a reliable means of distinguishing among homogenous residential neighborhoods; but that the same does not apply for women, who remain confined to a few occupations and industries regardless of where they live and work. At the same time, a geographical analysis of wage rates suggests that the spatial division of labor exerts relatively little effect on the earnings of men, but strongly mediates the opportunities available to women living in different parts of the metropolis.

Summary and Conclusions

After two decades of study, the daily journey to work remains one of the most closely-scrutinized phenomena in social and economic geography. Yet significant divisions persist among competing interpretations of the worktrip in broader social

terms. In this study, I seek to address these limitations with a largely descriptive, but theoretically-informed analysis of several complementary data sets. After two chapters describing the data, methods, and setting for my study, I undertake two sets of analyses. First, I exploit two newly-available data sets to map gender differences in local labor markets at a richly-textured intraurban scale. These analyses chart the geography of employment opportunities for individual workers, and also illuminate spatial differences between the occupational status of male and female workers. Second, I undertake a series of behavioral journey-to-work analyses, first reproducing the methods of conventional studies and then examining the mediating effect of contextual factors. The results indicate considerable variation in the links among labor-market segmentation, earnings, and women's commutes.

CHAPTER THREE
DATA AND METHODS

Introduction

Recent research on the changing employment landscape of the American city has reinvigorated urban geography, replacing the conventional dichotomy between economic and social processes with a rich portrait of the complex interdependencies among workers and firms.¹ Yet the literature remains divided along questions of epistemology and method, and analysts often disagree on the fundamental goals of empirical research. On the one hand, many feminist geographers study women's labor force participation at the scale of the neighborhood and the individual, seeking to interpret the manner in which women balance a multiplicity of often contradictory roles. This research highlights the contingent and dynamic interplay between social and geographic constraints and individual choices, and typically emphasizes the variety of strategies used by different women to juggle the time-space requirements of home and work.² By contrast, scholars adopting a more conventional approach study women's employment at a more aggregate level, relying heavily on secondary data sources at a broad spatial scale. Seeking to develop empirical generalizations, this work underscores the similar conditions faced by women in all parts of the city--the common, gendered experiences of occupational sex segregation, domestic labor, and spatial constraints.³

These different approaches highlight the tensions characterizing separate eras of feminist scholarship, and the theoretical implications of this dichotomy have attracted increasing attention in recent years.⁴ Often overlooked, however, are the more mundane data considerations--the technical and practical limitations of relating theoretical constructs to observable data. Consequently, many simple empirical questions remain shrouded in mystery, clouded by small or incomparable samples or outdated surveys. In this chapter, I review the main data considerations

¹Hanson, S., and G. Pratt (1988). "Reconceptualizing the links between home and work in urban geography." *Economic Geography* 64, 299-321; Hanson, S., and G. Pratt (1995). *Gender, Work, and Space*. London and New York: Routledge.

²England, K.V.L. (1993). "Suburban pink collar ghettos: The spatial entrapment of women?" *Annals of the Association of American Geographers* 83(2), 225-42.

³Madden, J.F. (1981). "Why women work close to home." *Urban Studies* 18, 181-94.

⁴Hanson, S., and G. Pratt (1994). "Geography and the construction of difference." *Gender, Place, and Culture* 1(1), 5-29. Rose, G. (1993). *Feminism and Geography*. Minneapolis: University of Minnesota Press.

involved in studies of local labor markets in the North American metropolis. First, I describe the three data sources for the study, highlighting the limitations in drawing causal inferences across different samples. Then I describe the methods I employ to study the relations among gender and labor-market outcomes at a fine intraurban scale. I rely on cartographic methods to examine the spatial structure of local labor markets among dual-earner households, and I use analysis-of-variance and multivariate statistical methods to analyze the relations among individual- and household-level variables and worktrip length among married women.

Observing and Measuring the Home-Work Link

To analyze the geographical dimensions of labor-market segmentation across the metropolitan area, I draw on large-sample datasets assembled by public agencies. These data sources necessarily restrict the analysis of causal processes and choices at the individual and household level, but provide insights complementary to those of much current urban feminist work. Many recent studies rely on intensive interviews with a sample drawn from a specific segment of the labor force (usually female clerical workers), and often are set within one or two neighborhoods. Recent debates have highlighted the uncertainty over the appropriate setting in which to evaluate broader theories of women's labor force participation, and underscore the need to document labor-market differences across the settlement fabric.

Of course, to do full justice to this question would require massive amounts of data. Ideally, we would like detailed information tied to each of the three components of the home-work link: the workplace (job characteristics, tenure, location), the residence (housing, individual, and family characteristics), and the spatial relationship between home and work (the work journey and other patterns of daily travel). Unfortunately, most existing data sources trade off among these different kinds of information, reflecting the underlying purposes of different surveys, agencies, and legally-mandated data collection efforts. On the one hand, studies of urban social patterns typically rely on summary tabulations of small-area data drawn from the U.S. Census of Population and Housing.⁵ Summary tabulations necessarily limit the range of variables available for study, and analyses taking geographic areas as the unit of analysis commonly suffer from problems of

⁵For examples of studies in the social area analysis and factorial ecology literatures, see Timms, D. (1971). *The Urban Mosaic*. Cambridge: Cambridge University Press. For an excellent review, see Ley D. (1983). *A Social Geography of the City*. New York: Harper & Row.

ecological inference. Moreover, most such datasets treat the household as an undifferentiated entity, ignoring gender-based inequality *within* the family.⁶ On the other hand, economic research of labor-market patterns draws on data sources with relatively little in the way of socioeconomic characteristics associated with the residence, or with vastly limited geographical detail, in line with the tendency to portray the metropolitan region as a single labor market. As a consequence of these limitations, research on women's labor force participation currently suffers from a dichotomy between in-depth analyses of surveys drawn from arguably unique settings (exemplified by the growing literature on the Worcester expedition⁷), and more coarse analyses drawn from national samples. With few exceptions, researchers fail to explore the fine-grained intraurban variations in the gender division of labor in a manner that provides comparable results.⁸

To balance geographic detail with a range of socioeconomic and labor-market variables, I draw on three different data sources, each with distinct advantages and limitations.⁹ First, I examine gender differences in socioeconomic and labor-force characteristics with the Public-Use Microdata Sample (PUMS) of the U.S. Census of Population and Housing. The PUMS files include richly detailed information on individual households and workers, but provide only a coarse geographic resolution. Second, I obtain detailed spatial information on travel patterns from the Travel Behavior Inventory (TBI) conducted by the Metropolitan Council of the Twin Cities. For a sample of nearly 10,000 households, the TBI presents information on the timing, purpose, and origin and destination of all trips made by individuals during a typical weekday. Unfortunately, the TBI includes only limited socioeconomic information, making it impossible to identify married-couple families. Finally, I use the Census Transportation Planning Package (CTPP) to analyze the spatial distribution of different kinds of jobs across the metropolitan

⁶See, e.g., Pratt, G., and S. Hanson (1988). "Gender, Class, and Space." *Environment and Planning D: Society and Space* 6, 15-35.

⁷For a review of their work on local labor markets in the Worcester, MA area over the past decade, see Hanson, S., and G. Pratt (1995), *op. cit.*

⁸The best exceptions are Hanson, S., and G. Pratt (1988). "Spatial dimensions of the gender division of labor in a local labor market." *Urban Geography* 9, 180-202; and Madden, J.F., and L. Chien Chiu (1990). "The wage effects of residential location and commuting constraints on employed married women." *Urban Studies* 27, 253-69.

⁹The best solution to these data limitations is to obtain special tabulations of the Census of Population and Housing directly from the Bureau; unfortunately, this was not possible at the time I undertook this study.

area. In contrast to the other two datasets, the CTPP is summary-level, but it provides several variables describing both residential and workplace locations for different segments of the occupational and industrial structure.

The Public-Use Microdata Samples (PUMS)

To examine the interaction of individual and household variables with commuting behavior, I rely primarily on the Public-Use Microdata Samples (PUMS) of the U.S. Census.¹⁰ The PUMS files provide stratified, random samples of all responses to the long-form questionnaire of the decennial Census of Population and Housing (Appendix A), permitting unparalleled scrutiny of social and demographic relations at the individual and household level. Unfortunately, the PUMS provide only limited geographic resolution; samples are issued for Public-Use Microdata Areas (PUMAs), consisting of specially-defined municipal aggregations with a minimum population of 100,000. Nevertheless, this coarse level of geographic resolution permits sociological analysis at a finer scale than the standard city/suburb dichotomy, and PUMA boundaries correspond reasonably well to distinct sectoral housing submarkets in the Twin Cities area (Figure 3.1).¹¹

To isolate gender differences in labor-market outcomes, I impose a series of restrictive criteria in the selection of sample households. Since one goal of this study is to examine indicators of social class *within* as well as *among* families, I limit the analysis to dual-earner, married-couple families. This criterion eliminates many women, but it permits a clear focus on households that exemplify the most serious feminist challenges to conventional stratification theory. This restriction also removes the complication of gender differences in residential locations, since husbands and wives in the sample reside together. I further restrict the analysis to households in which both spouses are of working age (16 to 64) and employed at least part-time (15 hours per week). Finally, I narrow the sample to workers employed outside the home who drive to work alone, thereby eliminating the effect of travel mode on commuting time.

¹⁰U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing*. 5 percent file. [Machine-readable data file]. Washington, D.C.: U.S. Government Printing Office.

¹¹Adams, J.S. (1991). "Housing submarkets in an American metropolis." In Hart, J.F., ed., *Our Changing Cities*. Baltimore: Johns Hopkins University Press, 108-26.

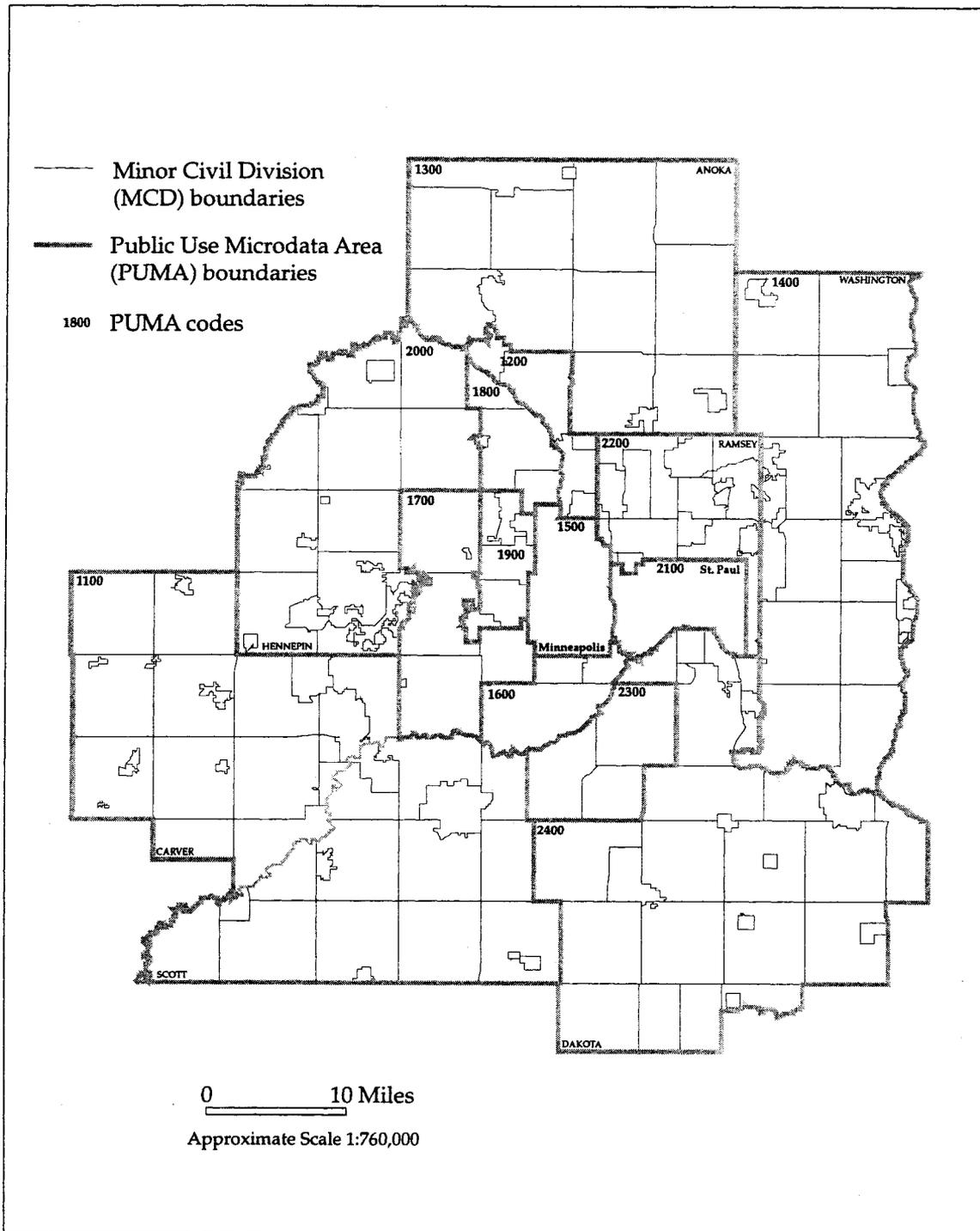


Figure 3.1. Public Use Microdata Area (PUMA) Boundaries in the Seven-County Twin Cities Metropolitan Area, 1990. Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing*. Five percent sample. [Technical documentation.] Washington, D.C.: U.S. Government Printing Office.

The PUMS Dual-Earner Database

I extract a set of variables to capture a range of relations at the individual and household level. I identify dual-earner, married-couple families from the census questions on marital status and labor force participation. I then construct a database consisting of separate records for each of the sampled households, dividing records into segments for the household, husband, and wife.¹² The household segment includes a limited range of variables on housing tenure, household income, presence and age of children, and place of residence by PUMA. Separate segments for husband and wife include a wider range of demographic indicators (age, education), labor force characteristics (employment status, income, occupation and industry of employment), and journey-to-work measures (place of work by PUMA, mode of travel, and one-way travel time to work). After minor variable transformations,¹³ the final dual-earner database includes 8,001 households, corresponding to an estimated 450,000 workers. This file constitutes the primary database for the study, providing a rich mosaic of information on gender differences in labor-market segmentation and commuting patterns across the metropolitan area.

In order to narrow portions of the analysis to men and women with a constant attachment to the labor force, I extract two subsamples from the main dual-earner database. First, I create a "full-time dual-earner" sample, in which both spouses work at least 30 hours per week. These restrictions reduce the sample to just under 5,900 families, corresponding to an estimated 330,000 workers. I use this

¹²The PUMS files are arranged in an hierarchical database structure, such that rows alternate between records for housing units and the individuals living in each housing unit. Wendy Treadwell of the University's Machine Readable Data Center (MRDC) provided invaluable assistance in transforming this file into a rectangular structure, in which each row includes both individual and housing variables. From the master file including all residents of the study area, I extract the sample of dual-earner, married-couple families, stitching together the segments for household, husband, and wife to create a single record for each dual-earner family.

¹³Only two of the variables require measurement scale transformations. First, I recode the education variable to approximate an interval scale, facilitating comparability with other measures in the statistical analysis. Second, I code the three-digit census occupational categories to the prestige scores of the 1989 General Social Survey of the National Opinion Research Center. The GSS scores are based on subjective rankings of job types by a representative sample of 1,500 English-speaking respondents in the United States. Conducted in 1989, the GSS provides the only recent survey of perceived status levels of work corresponding to the 1990 Census occupational categories. See Davis, J.A., and T.W. Smith (1991). *General Social Surveys, 1972-1991: Cumulative Guidebook*. Chicago: National Opinion Research Center, Appendix F. The remaining variables in the database require no adjustment other than simple transformations to achieve normality for parts of the statistical analysis in Chapter 6.

subsample for comparative purposes in the analysis of geographical variations in earnings (Chapter 5). Second, I create a sample of "fully-employed dual-earner" families, in which both spouses work year-round (at least 50 weeks in 1989) on at least a part-time basis (15 hours per week). These restrictions reduce the original sample of 8,001 to approximately 6,800, corresponding to an estimated 380,000 workers. I use this subsample to model the combined effects of individual earnings and household income on commuting times (Chapter 6).

The Travel Behavior Inventory (TBI)

To examine gender differences in the fine intraurban scale of local labor markets across the metropolis, I draw on the Travel Behavior Inventory (TBI) assembled by the Metropolitan Council of the Twin Cities.¹⁴ Since the 1950s, federal law has required the collection of a wide range of travel-related data at the metropolitan level, providing the basis for travel demand projections for planning and development purposes. The most recent effort in the Twin Cities was conducted in 1990, and constitutes the largest travel survey ever conducted in the region. The survey includes five separate components, which together document the daily movements of a sample of more than 45,000 people. For this study, I draw a subsample from the Home Interview Survey, the largest single component of the TBI. Designed to provide a baseline estimate of travel demand across the metropolitan area, the Home Interview Survey records detailed information on all trips made by persons in a stratified, one-percent sample of the region's population--nearly 10,000 households. For each individual over age five, the TBI records the timing, purpose, travel mode, and origin and destination of all trips made during a typical weekday period.

The TBI offers several advantages for this kind of study. In contrast to census data, the TBI provides an extraordinarily detailed portrait of individual movement patterns, and is not confined to the work journey. Moreover, the TBI treats trip segments separately: workers dropping off children to daycare on the way to work, for instance, report *two* separate trips. Most importantly, however, the TBI offers unparalleled geographic resolution. Designed to assist highway planners in forecasting travel demand along specific road segments, the TBI records trip-making

¹⁴Metropolitan Council (1992). *Home Interview Survey, 1990 Travel Behavior Inventory*. [Machine-readable data file]. St. Paul, MN: The Council; Metropolitan Council (1992). *Home Interview Survey, Methodology and Results*. [Technical documentation]. St. Paul, MN: Metropolitan Council.

patterns at a fine spatial scale. The primary summary level used for the TBI is the traffic analysis zone (TAZ), defined to identify homogenous land-uses to a resolution finer than that of the census tract, and (in some cases) delineating individual shopping malls, factories, or public institutions (Figure 3.2).¹⁵ In sum, this dataset offers unparalleled flexibility in both micro- and summary-level analysis of travel patterns, and presents the finest possible spatial detail on individual movement patterns across the metropolitan area.

To achieve this fine spatial resolution, however, the TBI must sacrifice socioeconomic detail. While the survey tells us a great deal about where and how individuals travel, it includes only the most elementary descriptors of *who* these travelers are—age, sex, and employment status. The TBI reports income only for the entire household, precluding analysis of earnings differences between men and women. Moreover, the survey includes no questions on marital status or family structure, making it impossible to identify married-couple, dual-earner households. Thus we cannot infer across the PUMS and TBI samples, which comprise distinct, albeit overlapping, samples.

The TBI Dual-Earner Database

The paucity of socioeconomic data in the TBI files requires several assumptions in constructing a database that approximates, as far as possible, a sample of married-couple, dual-earner families. First, I extract records for households in which the first respondent is employed, thereby assuming that either the husband or wife in a dual-earner family serves as the primary survey contact. Second, I exclude households in which the primary respondent is between 25 and 55 years old, reducing the probability of including non-spouse family members (e.g., parents or older children). Third, I retain households in which the *second* respondent is of the opposite sex of the primary respondent, employed, and aged between 25 and 55. This procedure necessarily assumes that the contact person recruits his or her spouse before recruiting other household members.¹⁶ The final

¹⁵The Home Interview Survey also includes rigorous quality control measures to ensure the locational accuracy of responses, including a custom-designed computer address-matching algorithm and manual checking of Hudson directories, telephone books, and other sources. See Metropolitan Council (1992), [Technical documentation], *op. cit.*, pp. 8-91

¹⁶This method is not without its weaknesses, but provides the best approach given the limitations of the dataset. The Home Interview Survey involved the recruitment of households from a master list of 30,000 addresses and telephone numbers; for each household agreeing to participate, one person agreed to serve as primary respondent in subsequent communications. Since all household members had to

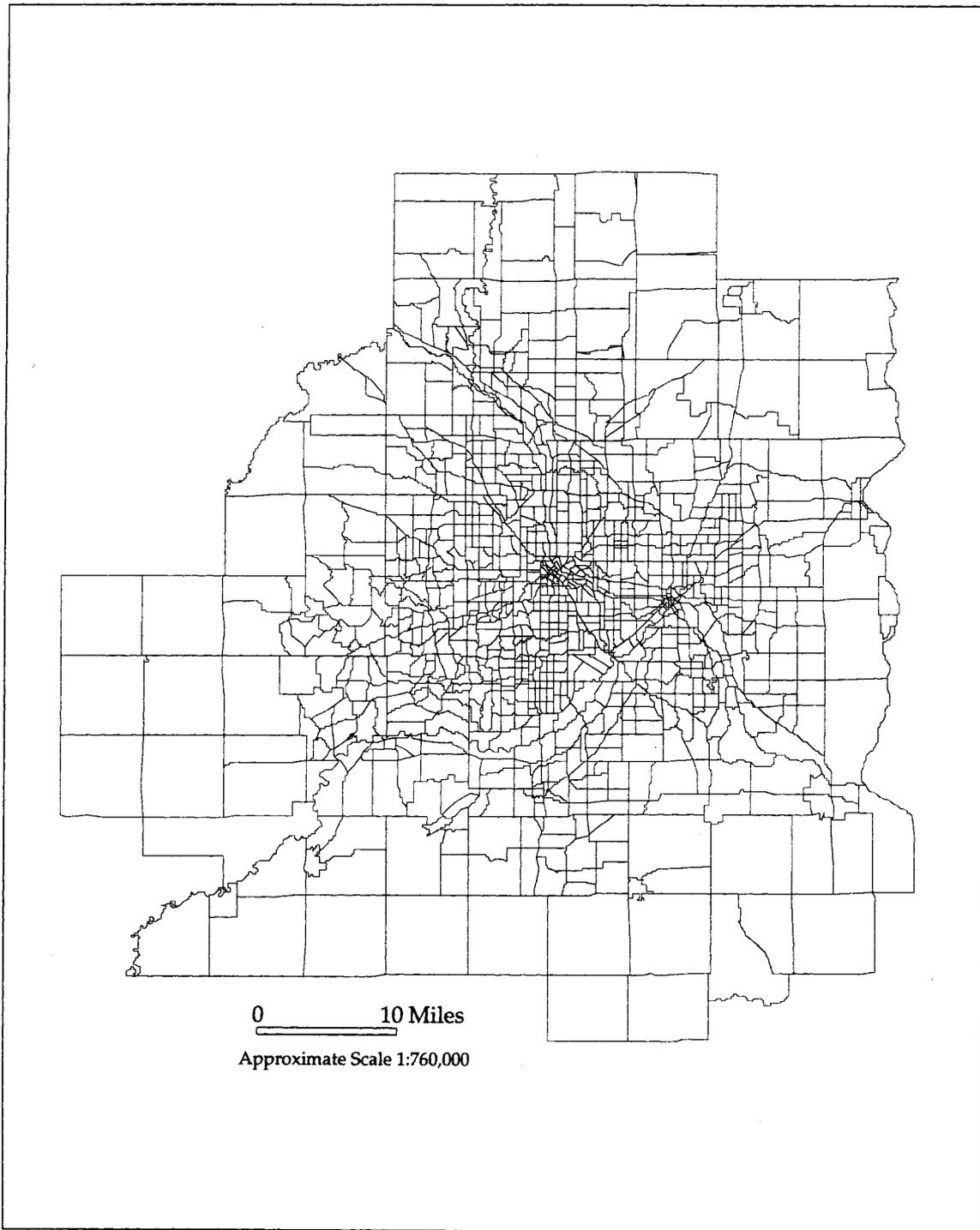


Figure 3.2. Traffic Analysis Zone (TAZ) Boundaries in the Seven-County Twin Cities Metropolitan Area. Source: Metropolitan Council (1992). *1990 Travel Behavior Inventory*. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.

sample of dual-earner families includes 3,411 households, corresponding to an estimated 512,000 workers (Table 3.1).

For this subsample I construct a database to facilitate comparative analysis of spatial labor markets with a geographic information systems (GIS) approach.¹⁷ First, I geocode the residential location of each household to the traffic analysis zone (TAZ) level (Figure 3.3) and extract codes for the location of the primary workplace for men and women in the subsample.¹⁸ This procedure permits detailed cartographic analysis of gender differences in workplace-residence separation, although it provides no information on the timing or distance of the work journey itself. Second, I tabulate a set of summary travel measures for the sampled men and women, extracting data on all trips made by private automobile. I aggregate the time (in minutes) and distance (in miles) spent in each of the following categories: total travel, work-related business trips, shopping trips, and work trips.

Significantly, the TBI-defined worktrip differs considerably from the Census work journey. Defined to include all trips ending at the workplace, the TBI measure counts only the final segment of a multiple-purpose work journey, and also counts return trips and commutes to more than one workplace. As such, the TBI work journey is not an indicator of workplace-residence separation, but instead provides an overall measure of daily travel necessitated by a person's employment circumstances.

participate in order for the household to be included in the final sample, in nearly all instances the primary respondent can be considered 'head of household.' See Metropolitan Council (1992), [Technical documentation], *op. cit.*, pp. 2-7.

¹⁷The Home Interview data files for the TBI are arranged in a relational database structure, consisting of four separate files. The *household file* consists of household variables, with information on household size, number of persons under (and over) age five, vehicles available, household income, and total number of trips made by all household members. Two *person files* describe the age, sex, employment status, and total number of trips made by each individual over age five. Finally, the *trip file* includes detailed information on the timing, purpose, mode, distance, and location of each trip made by persons over age five in the sample.

¹⁸While specific addresses are stripped from the final Home Interview Survey files, all locational data in the files—residence, workplace, and origin and destination of individual trip segments—are coded to census tracts, traffic analysis zones, and census blocks. I digitize household locations down to the TAZ level, providing spatial accuracy intermediate between the tract and block levels. The Seven-County Twin Cities region includes a total of 1,200 TAZs (1,165 internal zones, 35 cordon-line external stations).

Table 3.1. Distribution of Dual-Earner Household Samples.

Public-Use Microdata Area (PUMA) and constituent areas	Employed Civilian Labor Force (workers)	Dual-Earner PUMS Sample			Dual-Earner TBI Sample		
		Sample Size (households)	Est. No. of Workers (workers)	Prop. of Empl. Civ. Labor Force (percent)	Sample Size (households)	Est. No. of Workers (workers)	Prop. of Empl. Civ. Labor Force (percent)
1100 Carver County	26,057						
Scott County	30,750						
Total	56,807	673	25,354	44.6	188	25,606	45.1
1200 Anoka	8,630						
Columbia Heights	9,920						
Coon Rapids	29,489						
Tract 510.01	1,263						
Tract 510.02	2,578						
Total	68,463	428	27,462	40.1	202	28,726	42.0
1300 Rem., Anoka Co.	64,498	615	31,870	49.4	252	36,012	55.8
1400 Washington Co.	76,652	739	36,878	48.1	278	37,848	49.4
1500 Minneapolis	192,508	586	36,108	18.8	350	68,352	35.5
1600 Bloomington	51,813						
Richfield	20,327						
Tract 249.01	1,330						
Tract 249.02	32						
Total	73,502	435	26,784	36.4	187	26,456	36.0
1700 Eden Prairie	23,463						
Edina	23,495						
Minnetonka	27,926						
Plymouth	29,820						
Total	104,704	721	42,602	40.7	303	42,826	40.9
1800 Champlin	9,336						
Brooklyn Center	15,306						
Brooklyn Park	32,716						
Total	57,358	347	22,416	39.1	185	25,882	45.1
1900 Crystal	13,450						
Golden Valley	11,519						
Hopkins	10,125						
New Hope	12,323						
Robbinsdale	7,316						
St. Louis Park	26,394						

(continued)

Table 3.1. (continued).

Public-Use Microdata Area (PUMA) and constituent areas	Employed Civilian Labor Force (workers)	Dual-Earner PUMS Sample			Dual-Earner TBI Sample		
		Sample Size (households)	Est. No. of Workers (workers)	Prop. of Empl. Civ. Labor Force (percent)	Sample Size (households)	Est. No. of Workers (workers)	Prop. of Empl. Civ. Labor Force (percent)
1900 (continued)							
Tract 201.01	1,636						
Tract 201.02	1,002						
Total	83,765	450	28,198	33.7	217	31,984	38.2
2000 Rem., Hennepin Co.	59,588	612	27,350	45.9	202	27,824	46.7
2100 St. Paul	133,383	490	30,650	23.0	245	44,022	33.0
2200 Rem., Ramsey Co.	118,894	767	48,498	40.8	320	44,866	37.7
2300 Apple Valley	19,122						
Burnsville	30,795						
Eagan	28,797						
Total	78,714	521	34,700	44.1	254	37,490	47.6
2400 Rem., Dakota Co.	74,801	655	33,850	45.2	228	33,884	45.3
Total	1,243,637	8,039	452,720	36.4	3,411	511,778	41.2

Data Sources: U.S. Bureau of the Census (1992). Public-Use Microdata Sample, 1990 Census of Population and Housing. Five percent sample. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office; Metropolitan Council (1992). Home Interview Survey, 1990 Travel Behavior Inventory. St. Paul, MN: Metropolitan Council.

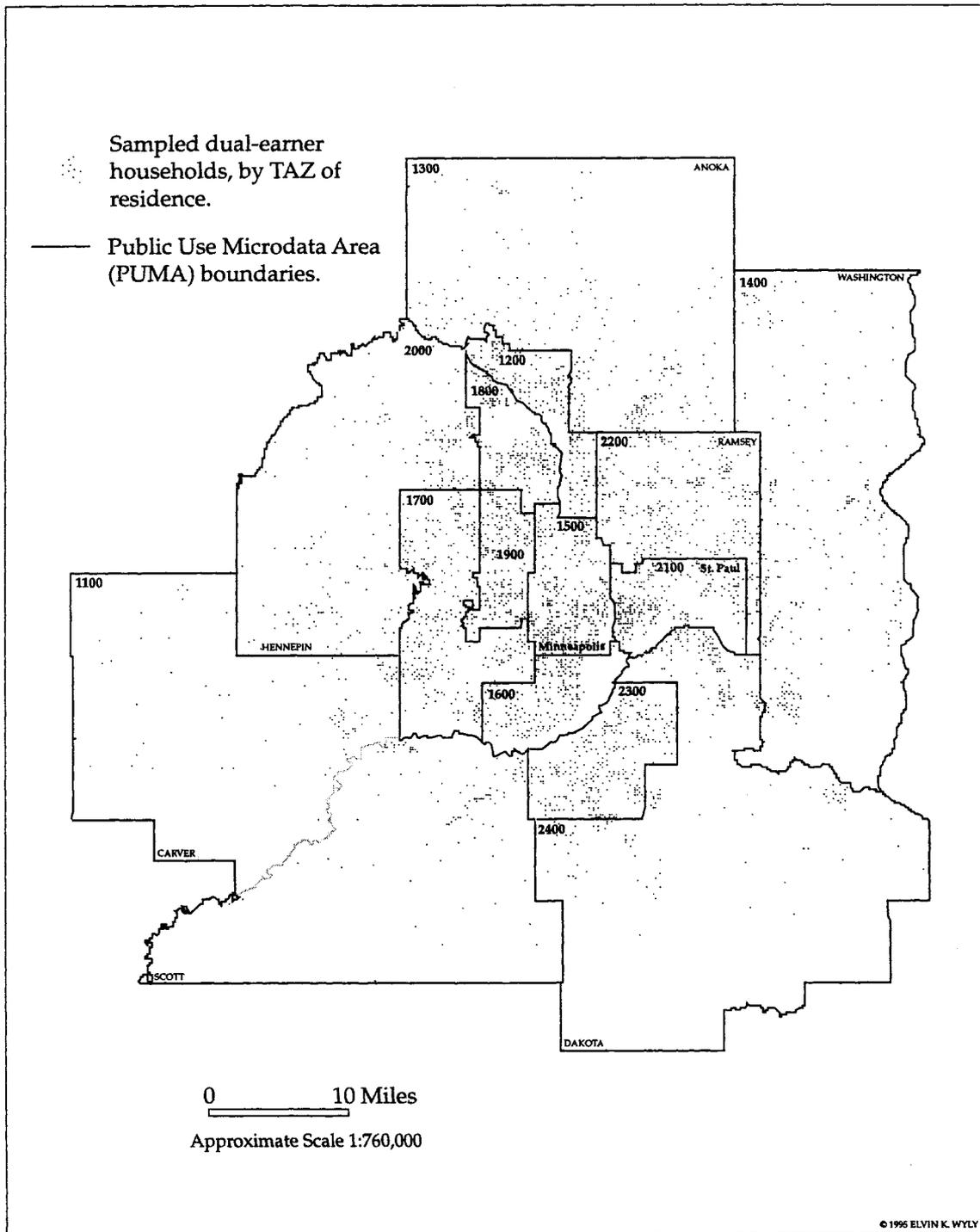


Figure 3.3. Dual-Earner TBI Households, by PUMA. Data Source: Metropolitan Council (1992). *Home Interview Survey, 1990 Travel Behavior Inventory*. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.

Distribution of Dual-Earner PUMS and TBI Samples

The dual-earner PUMS and TBI databases represent distinct but overlapping samples, providing complementary insights into the formation of local labor markets in the metropolis. Overall, the samples account for more than a third of the employed civilian labor force, permitting analysis of a broad segment of the middle class (Table 3.1). Both samples represent between one third and one half of the labor force across all parts of the study area, except for the central cities where the ratios fall to less than a quarter (Table 3.1).

Yet the two databases represent distinct populations. While the PUMS and TBI samples depict roughly equivalent proportions of the labor force in most suburban areas, the TBI's inclusion of unmarried couples and other households yields substantially larger shares in the central cities (PUMAs 1500, 2100) and in blue-collar, lower-middle class suburbs (PUMAs 1300, 1800) (Table 3.1). Even similar estimates, however, conceal the underlying differences between the two populations described by the PUMS and TBI datasets: both files depict roughly 25,000 workers in Carver and Scott Counties, for instance, but the TBI includes non-married households while excluding workers younger than 25 or older than 55. As a consequence of these substantive differences in the two samples--which are impossible to estimate--I remain highly cautious in drawing any inferences across the PUMS and TBI datasets.

The Census Transportation Planning Package (CTPP)

The third and final dataset provides a balance between the rich socioeconomic detail of the PUMS files, and the fine-grained spatial resolution of the TBI. Beginning with the 1980 decennial enumeration, the U.S. Bureau of the Census has issued the Census Transportation Planning Package (CTPP), a customized summary tabulation of labor-force, demographic and work journey variables used to evaluate and calibrate urban and regional travel demand models.¹⁹ The CTPP is available both at the state level (by urbanized area), and for selected metropolitan areas (by census tract and traffic analysis zone [TAZ]). For the Twin Cities area, the 1990 file

¹⁹U.S. Bureau of the Census (1994). *Census Transportation Planning Package, 1990 Census of Population and Housing, Minneapolis-St. Paul Metropolitan Statistical Area*. [Machine-readable data file]. Washington, D.C.: U.S. Government Printing Office; U.S. Bureau of the Census (1993). *Census Transportation Planning Package, 1990 Census of Population and Housing, Urban Element*. [Technical documentation for summary tape.] Washington, D.C.: U.S. Government Printing Office.

provides tabulations down to the level of the 1,165 zones delineated by the Metropolitan Council and the Minnesota Department of Transportation (Figure 3.2).

The three components of the CTPP provide unrivaled geographic detail on the spatial structure of local labor markets, while including a limited range of socioeconomic variables. Part I presents tabulations of population, households, sex, race, age, employment status, and a range of work journey characteristics for residents of each of the 1,165 zones in the study area. Part II presents a similar range of variables for employed workers, *summarized by zone of workplace*. Finally, Part III includes a limited range of work journey and demographic characteristics by commuting "flow"--i.e., by the individual cell of a matrix defined by the 1,165 sending and receiving zones.²⁰ Taken together, the CTPP resembles a customized version of the decennial census, permitting an extraordinarily detailed portrait of commuting patterns and the formation of local labor markets within the metropolis.

The CTPP database

As with the TBI, the CTPP sacrifices socioeconomic information to attain a high level of geographic resolution. Nevertheless, the files provide sufficient information to construct a database permitting the analysis of the spatial structure of local labor markets. I extract labor-force information for all employed workers by place of residence, performing separate tabulations for men and women by occupation and industry of employment. I perform the same procedure for workers by place of work, completing a master database of labor supply and labor demand within each of the 1,165 zones in the study area.

In contrast to the PUMS and TBI, the CTPP is summary level, and does not permit us to identify segments of the workforce other than those tabulated by the Bureau. Consequently, the CTPP database is quite distinct from the dual-earner samples. Nevertheless, this file is indispensable in sketching out the geographical structure of local labor markets at a fine intraurban scale. In Chapter 5, I draw extensively on this dataset to examine gender differences in the spatial distribution of employment opportunities, highlighting the marginal but significant way in

²⁰The definitions used to construct the CTPP create marginal, although significant, discrepancies in the universes for Parts I, II, and II. Part I includes residents of a given metropolitan area who work in non-metro areas, for instance, while Part II includes non-resident workers.

which gender mediates the relations between labor demand and labor supply across the metropolitan area.

Mapping the Gender Division of Labor

To analyze the relations between gender and the formation of local labor markets, I draw on three main analytical tools. First, I undertake a detailed cartographic analysis of gender differences in commuting patterns in Chapter Five. Mapping workplace locations of men and women in the dual-earner TBI sample provides fresh insight into the fine spatial scale at which workers and firms are bound together, complementing the more familiar tabulations of worktrip length. I use the CTPP to map employment opportunities for the workforce as a whole, highlighting the spatial patterning of women's segmentation into certain occupations and industries. Results of these analyses underscore the persistent and fine-grained variations in the distribution of men's and women's workplaces, which hold across most occupational and industrial categories. These patterns appear to sustain marginal, though significant effects on gender differences in earnings, with the spatial variation of wives' wages exceeding that of husbands in nearly all job types.

Second, I apply simple analysis of variance techniques to the dual-earner PUMS database to evaluate socioeconomic factors related to observed gender differences in commuting patterns. In Chapter 6, I undertake separate examinations of the role of family structure, occupation, part-time work, and individual and household income. I also examine how these relations vary across different portions of the metropolitan area, and I use conventional multiple-comparison means tests to examine geographic variations in worktrip length. Results suggest significant spatial variation in the gender gap in work travel among dual-earner households, with the greatest discrepancies in outlying suburban areas. This gap is correlated with a number of socioeconomic variables in different settings; but women's lower incomes and greater reliance on part-time employment appear to play important roles in all kinds of neighborhoods.

Third, I use a multivariate statistical approach to model the relations between gender, socioeconomic variables, and commuting patterns in different parts of the metropolitan area. To sort out the interrelationships of the numerous variables involved, I develop a conceptual model of commuting times among married

women in dual earner households. I then evaluate this model with linear structural relations (LISREL) methodology, providing the basis for the analysis presented in Chapter Seven.

A Conceptual Model of Married Women's Commuting

The literature on urban commuting patterns and women's employment highlights the complex web of relations between gender-specific conditions at both ends of the work journey--occupational segregation and lower earnings in the labor market, and unequal division of labor within the household itself. To analyze how interactions among these factors influence the observable spatial outcome of labor-force participation, I propose a path model relating wives' worktrips to four sets of variables: socioeconomic status, social role, husband's status, and household resources.

Socioeconomic status and social role exert direct effects on the commuting patterns of married women (Figure 3.4). Women with higher-than-average income and educational attainment typically rely on broader job-search networks than less affluent women, creating a positive link between status and worktrip length.²¹ Moreover, the spatial concentration of high-wage office jobs in downtown employment nodes may require longer trips among well-educated, high-status suburban women. Conversely, wives' social roles typically exert direct negative effects on the worktrip, reflecting the greater prevalence of part-time work among women, as well as the presence of young children in the household.²²

Inequalities within the dual-earner household mediate the effects of status and role on the spatial labor markets of married women (Figure 3.4). Income and educational attainment covary closely among husbands and wives, thereby broadening the job-search networks of both spouses in high-status households. Moreover, higher-income families' preference for low-density suburban residential

²¹Hanson, S., and G. Pratt (1991). "Job search and the occupational segregation of women." *Annals of the Association of American Geographers* 81(2), 229-53.

²²Most studies conclude that the presence of young children in dual-earner families decreases the worktrip of wives, but has no consistent effect on the husband's work journey. See, among others, Singell, L.D., and J.H. Lillydahl (1986). "An empirical analysis of the commute to work patterns of males and females in two-earner households." *Urban Studies* 2, 119-29.

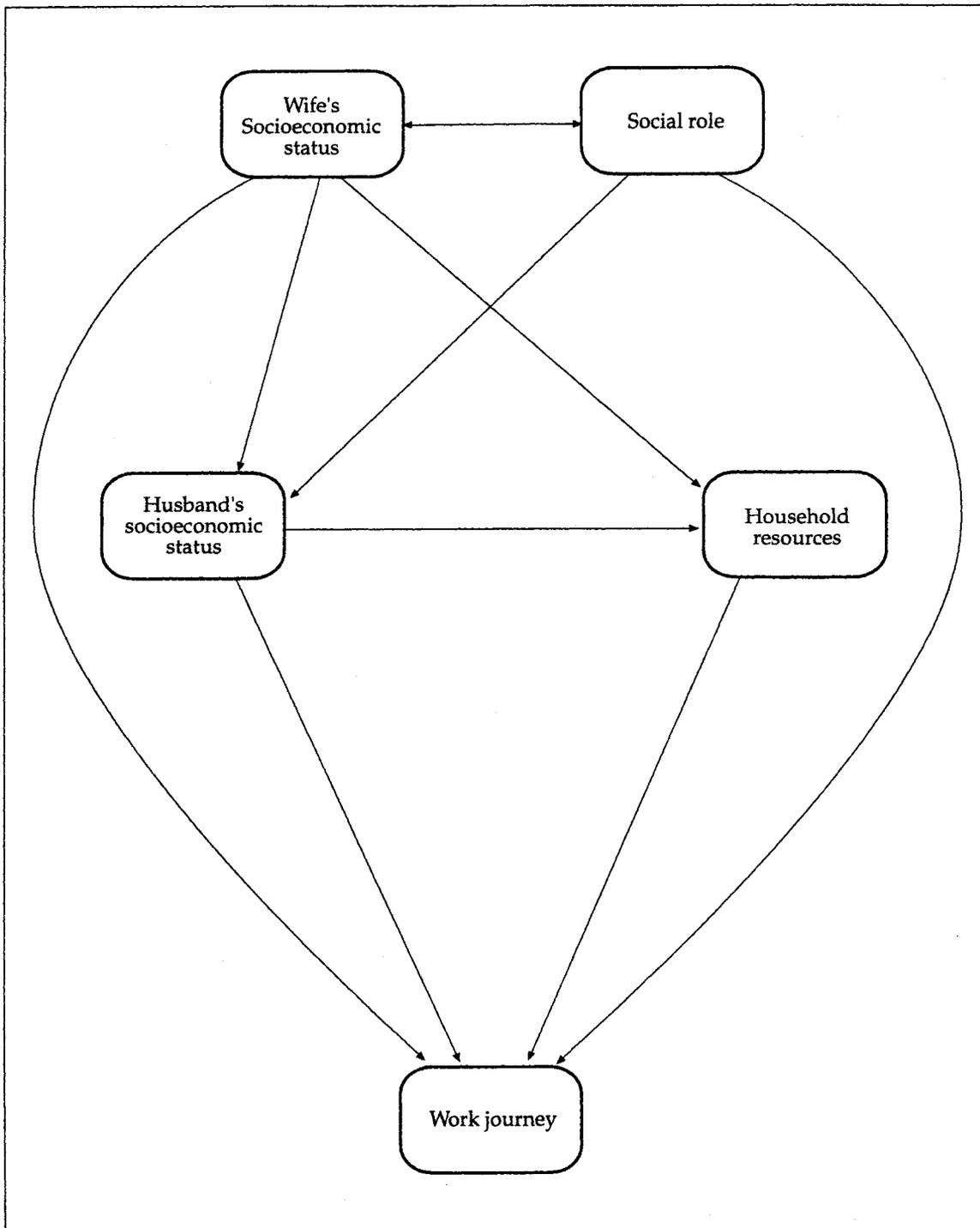


Figure 3.4. Conceptual Model of Commuting Time for Married Women.

locations lengthens the worktrips of both spouses, and may stretch wives' journeys if moves reflect the locational considerations of the husband's workplace.²³

Modeling the Commuting Patterns of Married Women

To analyze the interactions among these direct and indirect effects, I use linear structural relations (LISREL) methodology to model the commuting patterns of married women in different parts of the metropolitan area. LISREL methods have been applied to a wide range of problems in the social and behavioral sciences, and share many of the significance testing procedures and basic assumptions of the general linear model (GLM).²⁴ LISREL provides added flexibility in model specification, however, and includes a full range of path- and factor-analytic submodels. The software developed to estimate LISREL problems is now in its seventh version, and permits a number of useful facilities not available in more conventional GLM applications.²⁵

The main distinction between LISREL methods and other GLM applications lies in the treatment of measurement error. While conventional approaches divide observed covariance patterns into two components (putative cause-and-effect relations, and error terms) LISREL incorporates the added effect of error in the measurement of independent variables. This distinction helps to evaluate, for example, the validity of using income and occupational prestige as indicators of 'social class.' This portion of the LISREL model is termed the *measurement model*, and involves a confirmatory factor analysis relating theoretical constructs to observed indicator variables. The second phase of LISREL analysis is the *structural equation model*, which estimates the causal relations among the latent constructs.

²³*Ibid.*

²⁴Jöreskog developed a general methodology for LISREL-type problems in the early 1970s, and the models have since gained wide acceptance in sociology, economics, psychology, and other fields. LISREL methods have also been referred to as covariance structure models, structural equation models, linear causal analysis, path analysis, and other terms. Jöreskog, K.G. (1970). "A general method for analysis of covariance structures." *Biometrics* 57, 239-57; Jöreskog, K.G. (1973). "A general method for estimating a linear structural equations system." In Goldberger, A.S., and O.D. Duncan, eds., *Structural Equation Models in the Social Sciences*. New York: Academic Press, 85-112.

²⁵Jöreskog and Sörbom/SPSS, Inc. (1989). *LISREL 7: A Guide to the Program and Applications*. Chicago: SPSS, Inc.

LISREL methods involve the iterative fitting of a model-implied covariance matrix (Σ) to a covariance matrix of observed indicators (S).²⁶ The model-implied Σ is estimated from the simultaneous solution of three equations: separate *measurement* equations for exogenous and endogenous constructs, and a *structural* equation relating the latent variables. In turn, a set of eight parameter matrices define these three equations (Figure 3.5), specifying the hypothesized relations between observed indicators and latent variables (Λ_x and Λ_y), the causal links among the latent constructs (β and Γ), and a series of covariance and error terms (ϕ , δ , ϵ , and ζ). In practice, LISREL problems require the specification of both measurement and structural relations--respectively, the pattern of relations among observed indicators and latent constructs, and the causal links among latent constructs. Typically, researchers design a path diagram (Figure 3.5) before specifying the set of parameter matrices input into the program. Finally, after the equations have been estimated, the analysis involves the evaluation of goodness-of-fit and the interpretation of statistically significant causal links.²⁷

²⁶When estimated with the maximum-likelihood criterion, the algorithm minimizes the fit function $F = \log |\Sigma| + \text{tr}(S\Sigma^{-1}) - \log |S| - (p+q)$, where Σ is the model-implied covariance matrix; S denotes the covariance matrix of observed indicators; and p and q denote the number of exogenous and endogenous indicators, respectively. F is always non-negative, approaching zero as Σ and S converge to a perfect model fit.

²⁷Evaluating goodness-of-fit involves the comparison of the observed and model-implied covariance matrices, and a test of the hypothesis that divergences between S and Σ are the result of random sampling error. The most common statistic is chi-squared (χ^2), which is derived directly from the log-likelihood ratio: $\chi^2 = -2(-1/2n [\text{tr}(S\Sigma^{-1}) + \log |S| - \log |\Sigma| - (p+q)])$, where n is the sample size; S is the observed covariance matrix; Σ is the model implied covariance matrix; p is the number of endogenous indicators; and q is the number of exogenous indicators. Since χ^2 depends on sample size, however, even small differences lead to the rejection of well-fitting models when estimating large-sample problems, prompting researchers to propose several alternatives. Many analysts suggest that well-fitting models yield χ^2 /d.f. ratios below 5, where d.f. is the degrees of freedom, given by $d.f. = 1/2 [(p+q)(p+q+1)] - t$, where p is the number of endogenous indicators, q is the number of exogenous indicators, and t is the number of coefficients to be estimated. The magnitude of d.f. provides a measure of model 'efficiency'--i.e., efficient models produce a close approximation of the observed covariance matrix with the smallest possible number of paths among variables, yielding a large value of d.f. Other researchers argue that N=200 is an upper bound to the sample size yielding reliable values of χ^2 at the typical 95% level. Wheaton, B., B. Muthen, D. Alwin, and G. Summers (1977). "Assessing reliability and stability in panel models." In Heise, D., ed., *Sociological Methodology 1977*. San Francisco, CA: Jossey-Bass, 84-136. Carmines, E. and J. McIver (1981). "Analyzing models with unobserved variables: Analysis of covariance structures." In Bohrnstedt, G., and E. Borgatta, eds., *Social Measurement: Current Issues*. Beverly Hills, CA: Sage. Hoelter, J.W. (1983). "The analysis of covariance structures: Goodness-of-fit indices." *Sociological Methods and Research* 11, 325-44. For excellent reviews of the alternative solutions, see Hayduk, L.A. (1987). *Structural Equation Modeling with LISREL: Essentials and Advances*. Baltimore, MD: Johns Hopkins University Press.

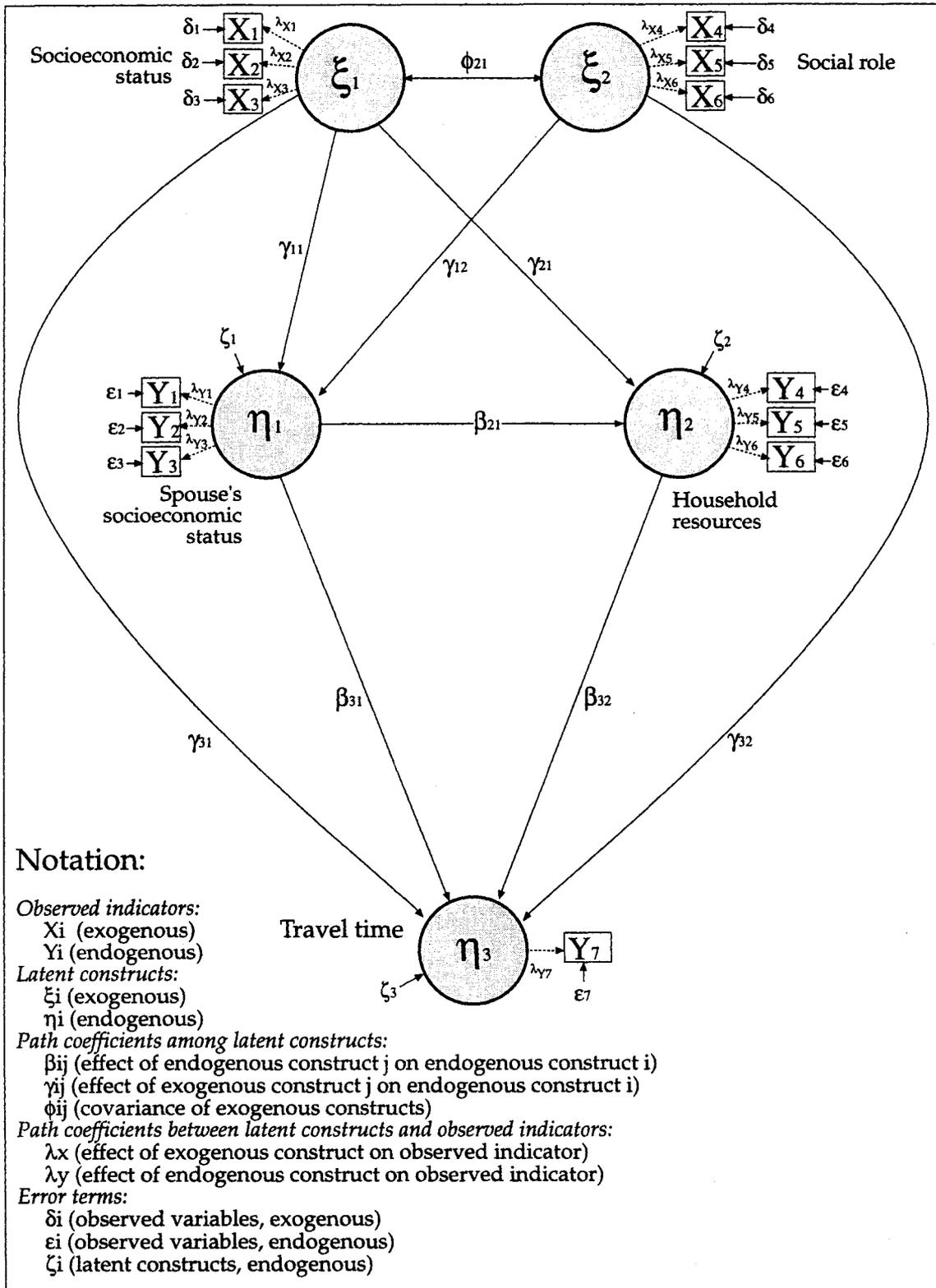


Figure 3.5. Path Diagram for LISREL Model Specification.

In contrast to more conventional regression approaches, not all model specifications can be estimated: if a particular path and matrix specification fails a confirmatory factor analysis or is otherwise ill-conditioned, the algorithm stops. Indeed, the vast majority of the more intricate specifications I developed failed to converge on acceptable values, an indication of the difficulty of analyzing the link between commuting time and individual characteristics in micro-level data. Consequently, LISREL is an unusually rigorous analytical tool, and provides an excellent method for evaluating alternative relations among sociological constructs and observed variables.

For this study, I calibrate a series of models to examine the determinants of commuting time among married women, drawing on the dual-earner PUMS database. In this Chapter I present the path diagram for one of the earliest models I refined, even though the algorithm rejected the validity of this specification (Figure 3.5). In Chapter 6 I describe the requisite modifications and revisions performed, and so I present this specification only as a summary of how the salient theoretical constructs are related to observed indicator variables.

The full LISREL specification includes two endogenous latent constructs (socioeconomic status and social role) and three endogenous latent variables (spouse's socioeconomic status, household resources, and travel time) (Figure 3.5). Observed indicators for the status constructs include annual wage and salary income (X1, Y1), occupational prestige (X2, Y2), and years of education (X3, Y3). Social role indicators include the total number of children present (X4), the number of children under age six (X5), and the wife's weekly work hours (X6). Household resources are measured by total household income (Y4), total interest and dividend income (Y5), and the total number of vehicles available to the household (Y6). Finally, the work journey is measured with a single indicator, the self-reported one-way travel time to work (Y7).

Summary

Given the limited scope of this study, it is impossible to overcome the inherent limitations of a purely quantitative analysis of secondary data sources. Yet it is important to bear in mind the risks involved in extrapolating from observed spatial patterns to causal relations or individual choices. Nevertheless, I believe my approach provides insights complementary to those of contemporary feminist work in

urban social geography. The PUMS database provides rich socioeconomic information on the largest possible sample of families, facilitating comparability between cities and permitting an evaluation of social patterns in different parts of the same city. The TBI database offers a glimpse of a wide range of types of movement through urban space, permitting an evaluation of the prevalence of gender differences for non-work travel. Finally, the CTPP database invites geographical analysis of spatial divisions in the workforce at both ends of the work journey, complementing the more common (and narrow) focus on worktrip length. By using a suite of cartographic and statistical methods and tacking back and forth among data sets with contrasting mixes of social and spatial resolution, I hope to sketch the boundaries of local labor markets as well as to probe the social character inside them.

CHAPTER FOUR

LOCAL CONTEXT

Introduction

The setting for the study is a seven-county region centered on the Twin Cities of Minneapolis and St. Paul (Figure 4.1). With a 1990 population of 2.3 million and a built-up area of nearly 900 square miles, the place provides a good setting in which to evaluate the formation of spatially-differentiated labor markets. Moreover, the Twin Cities area exemplifies many demographic and economic trends that make it a particularly striking case study of the geography of women's employment. On the demand side, the region has the essential elements of high female labor force participation: unemployment rates that consistently fall below the national average, and a diversified industrial structure with vibrant service-sector growth. On the supply side, cultural norms have nurtured acceptance of women's employment to a much greater degree, and much earlier than, many other parts of the country.

The region's long history of high rates of employment among women provides a unique opportunity to evaluate the durability of gender-based labor market segmentation over time. Limited evidence in the historical record would support optimistic expectations. Elizabeth Faue, for example, has traced the prominent role of women in the labor struggles engulfing Minneapolis during the 1930s, highlighting the early influence of feminist models of labor organizations. These models viewed wage claims as important parts of the struggle for workers' rights, but as only one facet of the labor agenda. Faue recounts how this 'community'-based model of labor organization was supplanted after World War II to be replaced by a more bureaucratized model focusing exclusively on wage claims. Yet the early prominence of women in the public sphere might lead us to anticipate, among other things, lower than average levels of occupational sex segregation.¹

Labor Demand and Women's Employment

For most of this century, economic conditions have accentuated the demand for female labor in the Twin Cities. Like most mid-continent cities founded in the mid-19th century, Minneapolis and St. Paul grew rapidly as railroad centers, exploiting natural resources on the western edge of the settlement frontier before

¹Faue, E. (1991). *Community of Suffering and Struggle: Women, Men, and the Labor Movement in Minneapolis, 1910-1940*. Chapel Hill: University of North Carolina Press.

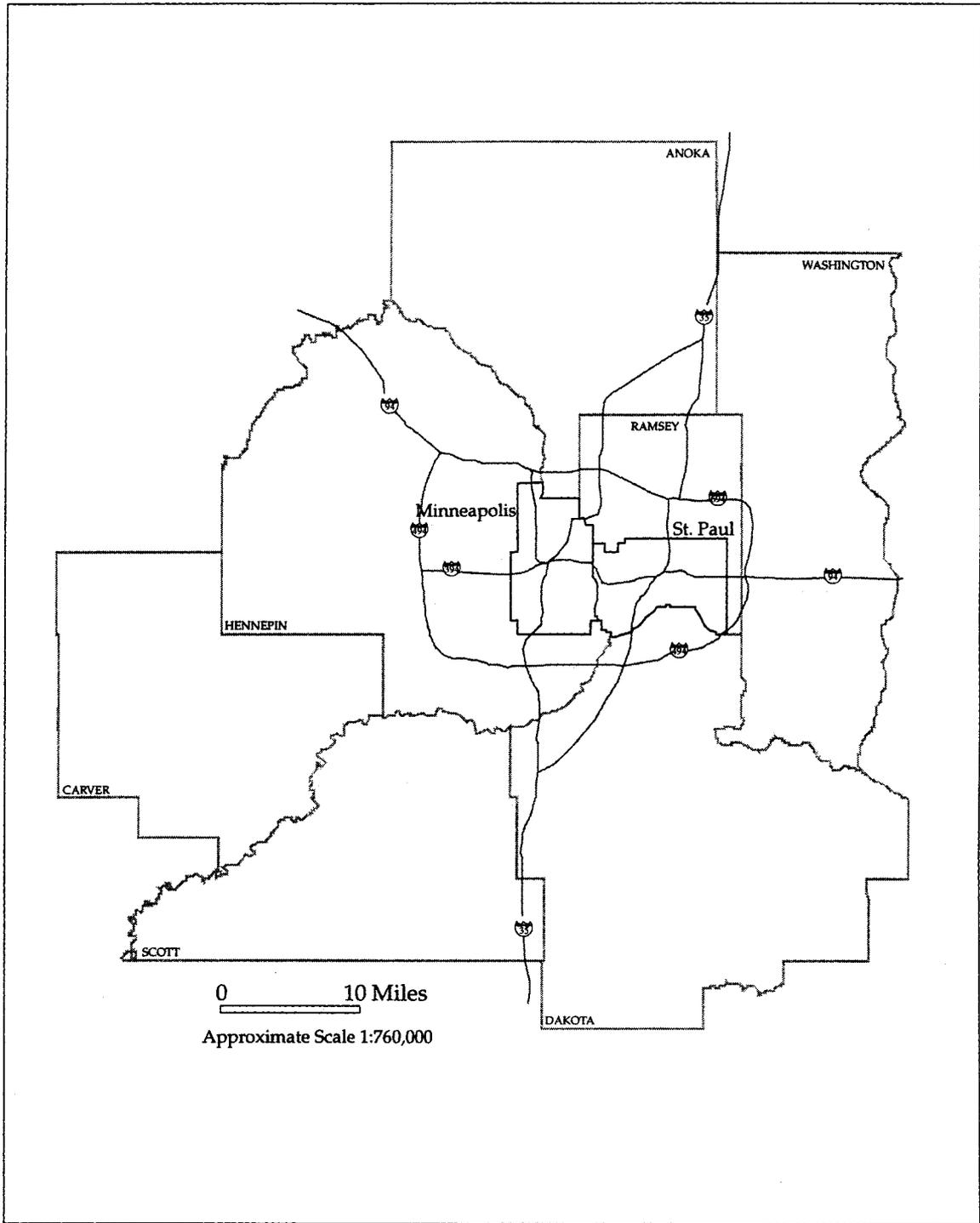


Figure 4.1. Seven-County Twin Cities Metropolitan Area.

shifting to industrial production. The Twin Cities were forced to diversify at a comparatively early stage, however; aggressive logging depleted northern Minnesota's pine forests by 1915, and alternative shipping routes sapped demand for Minneapolis' milled flour after World War I, forcing the nascent metropolis to turn to manufacturing and service functions.² In the interwar years, the Twin Cities firmly established its position as the primary trade and service center for an area extending from central Wisconsin to the western border of Montana.³

In line with national trends, both world wars accentuated demand for female labor in the Twin Cities, with wartime production drawing women into new jobs, as well as those vacated by departing men.⁴ World War I accelerated trends already underway, with the wartime economy drawing more women from rural Minnesota into service jobs and the expanding sphere of office work in downtown Minneapolis and St. Paul. Between 1910 and 1920 women's employment in clerical occupations more than doubled in Minneapolis, reflecting the feminization of the clerical labor force throughout the American urban system.⁵ In the 1920s a thriving garment district developed in Minneapolis, and by the early 1930s the industry employed nearly 5,000 women, mostly in a four-block area on the fringe of the city's warehouse district.⁶ World War II brought even larger numbers of women into paid employment, and removed many of the barriers to women's entry into industrial occupations. By war's end, female employment in the Twin Cities had swelled by more than 50 percent, and women comprised over 40 percent of the entire labor force.⁷

²Adams, J.S., and B. VanDrasek (1993), *Minneapolis-St. Paul: People, Place, and Public Life*. Minneapolis: University of Minnesota Press, pp. 37-41.

³Borchert, J.R. (1987). *America's Northern Heartland: An Economic and Historical Geography of the Upper Midwest*. Minneapolis: University of Minnesota Press.

⁴Greenwald, M. (1980). *Women, War, and Work*. Westport, CT: Greenwood Press; Hartmann, S. (1982). *The Home Front and Beyond: American Women in the 1940s*. Boston: G.K. Hall.

⁵U.S. Census figures, cited in Faue (1991), *op. cit.*, p. 40, Table 1.6. Women comprised only a tenth of the workforce of Minneapolis banks on the eve of the War, but accounted for four-tenths after little more than a year. Higley, M. (1919). *Women in Banking in the City of Minneapolis*. Minneapolis: Woman's Occupational Bureau, p. 7. As men predominated in the expanding manufacturing sector, clerical jobs were redefined from temporary vocation for upwardly-mobile young men, to career occupations for women. Davies, M.W. (1982). *Woman's Place is at the Typewriter: Office Work and Office Workers, 1870-1930*. Philadelphia: Temple University Press.

⁶Faue (1991), *op. cit.*, p. 101.

⁷Within six months of the attack on Pearl Harbor, defense plants in the area were scrambling to fill some 16,000 new jobs. By 1945, the hastily-constructed Twin Cities Ordinance Plant in Arden Hills employed some 17,000 women, more than half its workforce. Records of the Women's Bureau, 1945, cited in Faue, E. (1991), *op. cit.*, *passim*.

Metropolitan Spatial Structure and Women's Employment

Five years after war's end, the geography of women's employment closely mirrored textbook theories of the day. Employed women worked in downtown office and service jobs, and lived with their families or in dense apartment districts along streetcar corridors south of downtown Minneapolis and west of central St. Paul (Figure 4.2). Overall, only two of five women were in the labor force in 1950, but two out of three women living in the downtown cluster of apartment houses were in the workforce (Figure 4.2). The sole exceptions to this pattern include a veteran's home adjacent to Fort Snelling, south of Minneapolis, and a cluster of food-processing functions at the stockyards in South St. Paul.

While the immediate postwar years brought a temporary decline in women's paid employment, the half-century commencing in 1945 brought dramatic transformations of the labor force in American cities. Two forces have been especially important in reshaping the geography of women's employment in the Twin Cities. First, successive housing booms pushed the frontiers of residential subdivision activity far beyond central city limits, thereby laying the basis for subsequent rounds of locational shifts of employment (e.g., suburbanization of commercial and retail jobs). In Minneapolis and St. Paul, housing booms produced spatial patterns conforming closely to the idealized form of conventional urban models, with tiers of residential subdivision at successively lower densities, and differentiated along well-defined radial sectors.⁸ Second, demographic and economic changes accelerated the rise in female labor force participation, and brought increasing numbers of suburban women into the workforce. By 1990, seven of ten women in the Twin Cities were in the labor force, giving the area one of the nation's highest female participation rates.

The spatial dimensions of the postwar housing boom and the increasing feminization of the workforce are both well-documented trends. Yet these forces intersected in a distinctive manner in the Twin Cities, yielding an unusual setting with a highly feminized workforce in a classical urban spatial structure. Consequently, the region provides a unique case study of gender differences in the formation of local labor markets.

⁸Adams, J.S. (1970). "Residential structure of Midwestern cities." *Annals of the Association of American Geographers* 60(1), 37-62.

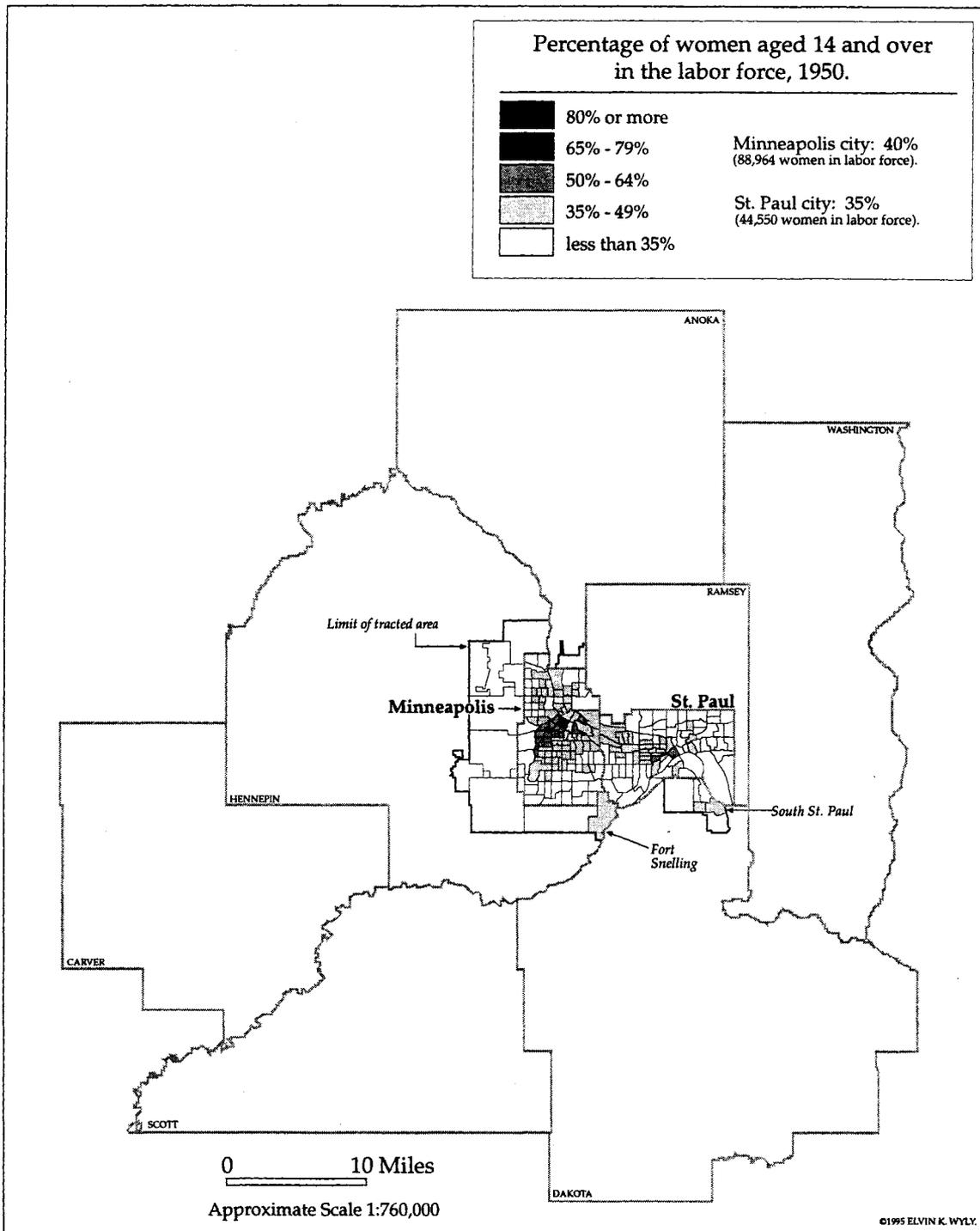


Figure 4.2. Female Labor Force Participation, 1950. Data Source: U.S. Bureau of the Census, (1952). *1950 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul*. Washington, D.C.: U.S. Government Printing Office.

Urban Realms and Axes of Growth

The postwar spatial transformation of the Twin Cities helped to alter the geography of women's employment in the 1960s and 1970s. Unlike most dual-city regions, Minneapolis and St. Paul developed separate and autonomous cores, with a full range of functions in each commercial agglomeration.⁹ As a result, successive booms in residential construction projected housing sectors outward from two origins. The classical pattern of functional differentiation within the central business districts helped to sustain the distinctive character of these sectors, reinforcing the development of economically and culturally distinct counterparts on opposite sides of the expanding urban area.¹⁰

This pattern reinforced spatial divisions in the labor market, and projected spatially-differentiated workforces outward into the suburban ring. Along one axis, suburban growth followed the alignment of major rail lines at the heart of the region's industrial production core (Figure 4.3). This axis stretched from the river landing in downtown St. Paul, through an opening in a glacial moraine into the northeast quadrant of Minneapolis. Industrial functions remained tied to this corridor until the early 1960s, and thus the growth of suburbs for manufacturing workers generally extended from this early linear pattern.¹¹ The historical legacy of the rail and industrial corridor between Anoka and Hastings remains visible even today, with the living and working spaces of manufacturing employees--blue- and white-collar alike--tracing out a distinctly axial pattern along the route of today's Burlington Northern Railroad (Figure 4.4).¹²

⁹Hartshorne, R. (1932). "The Twin City district: A unique form of urban landscape." *Geographical Review* 22(3), 431-42.

¹⁰Horwood, E., and R. Boyce (1959). *Studies of the Central Business District and Urban Freeway Development*. Seattle: University of Washington. Hoover, E., and R. Vernon (1959). *Anatomy of a Metropolis*. New York: Doubleday. Hoyt, H. (1939). *Structure and Growth of Residential Neighborhoods in American Cities*. Washington, D.C.: Federal Housing Administration.

¹¹While suburbanization of manufacturing accelerated immediately after the war, the ample supply of remaining industrial sites inside the cities stemmed the tide for nearly a decade. By the early 1960s, however, the wave of new and relocating plants gathered momentum, gravitating toward the radial highways and circumferential routes south and west of Minneapolis. Prestwich, R. (1968). *The Manufacturing Industry of the Twin Cities: Changes in Locational Emphases, 1946-1967*. Unpublished M.A. Thesis. Minneapolis: University of Minnesota. The northwest/southeast axis remains prominent for most heavy industrial operations, however, and development in the south and west suburbs is dominated by high-tech manufacturing and commercial/retail functions that display fewer tendencies toward functional agglomeration. Baerwald, T.J. (1978). "The emergence of a new 'downtown.'" *Geographical Review* 68(3), 308-18.

¹²The central axis of railroad and industrial land stretching southeast to northwest across the Twin Cities was initially comprised of several rail lines. In the early 1970s, however, the Northern Pacific,

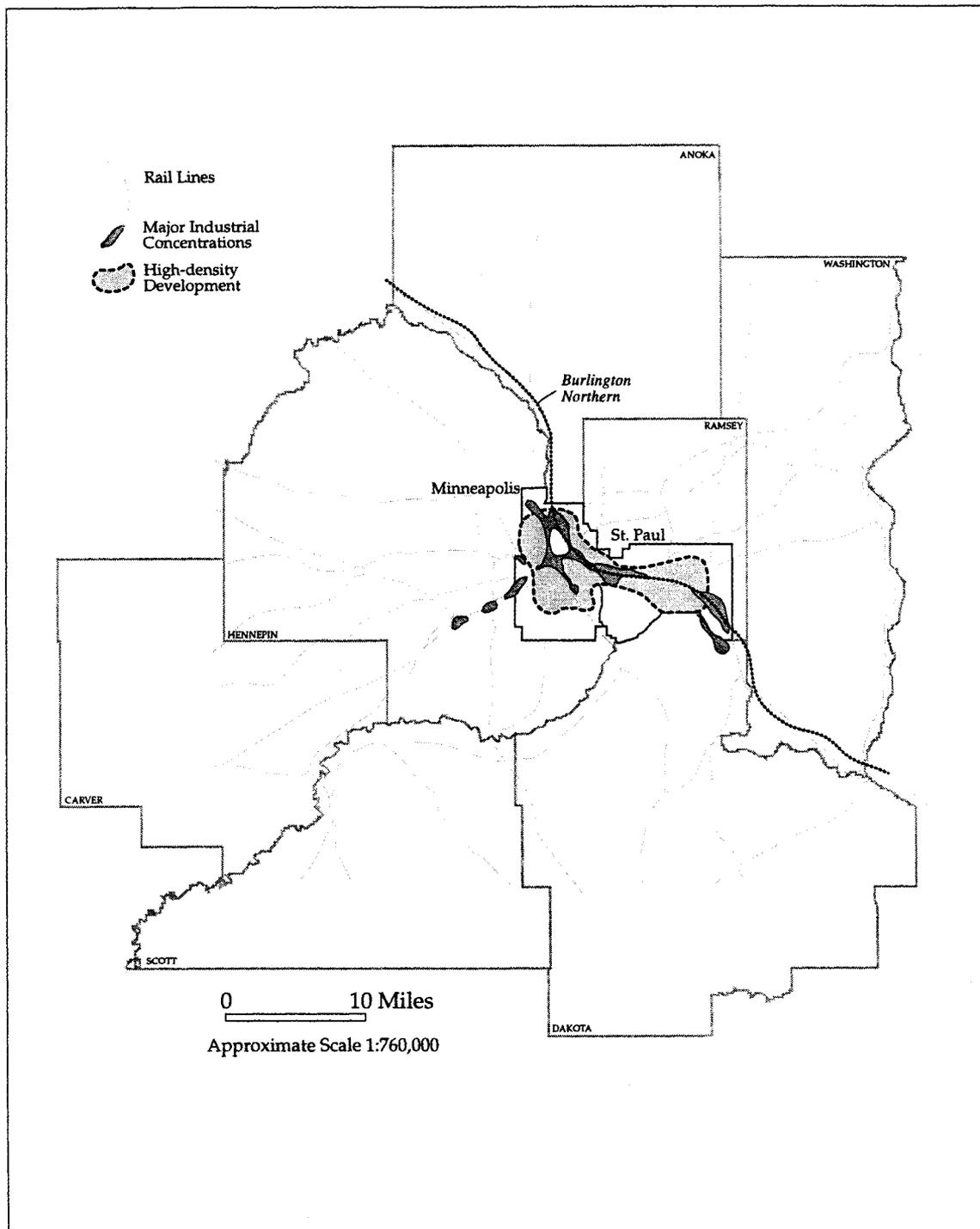


Figure 4.3. Twin Cities Rail and Industrial Axis, 1920. Source: after Borchert, J.R. (1987). *America's Northern Heartland: An Economic and Historical Geography of the Upper Midwest*. Minneapolis: University of Minnesota Press, Figure 52, p. 153.

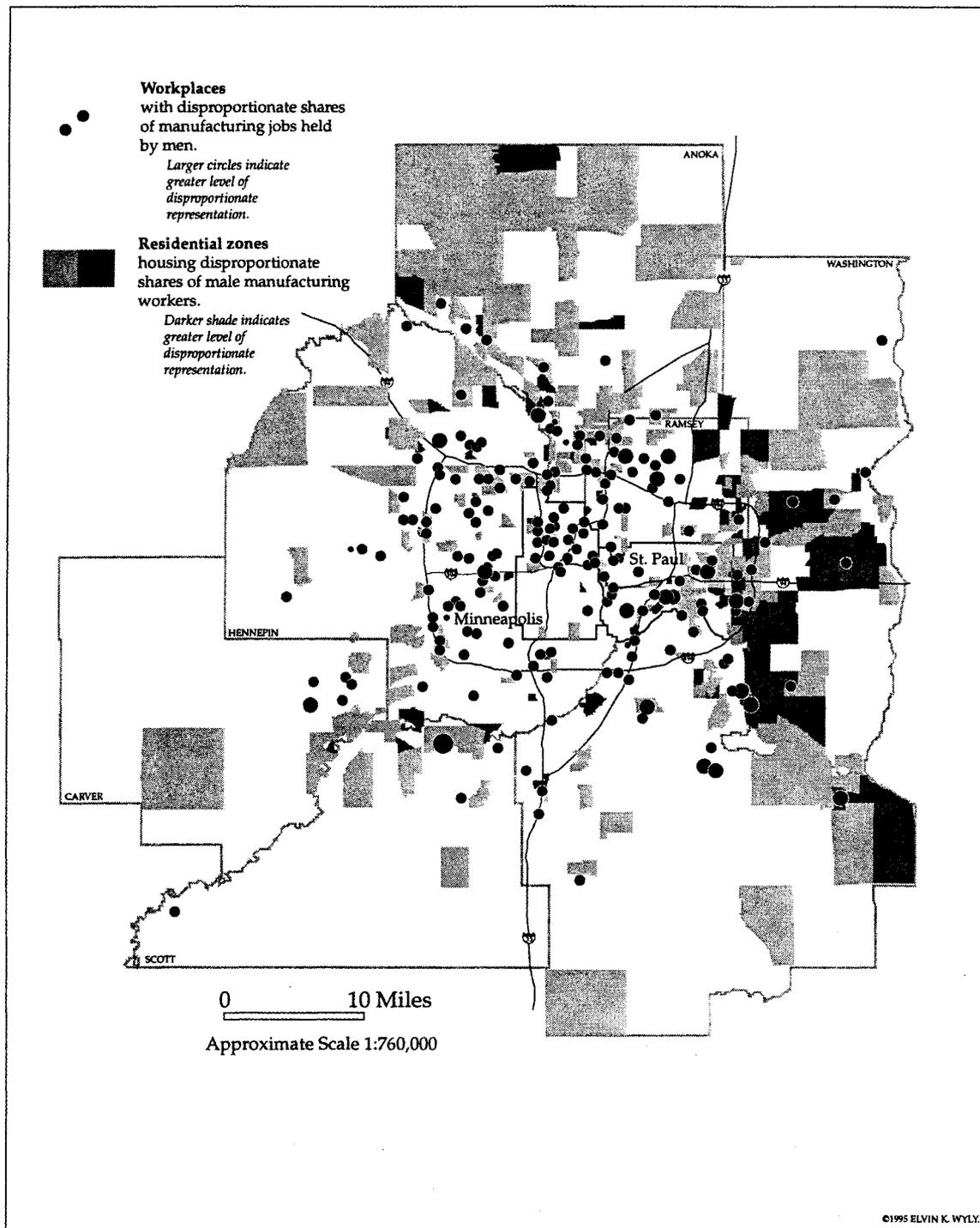


Figure 4.4. Twin Cities Production Realm. Data Source: Figures 5.10 and 5.11.

A second axis of growth gravitated toward broad, uninterrupted tracts of buildable land along moraines, lake views, and other amenities (Figure 4.5). By the closing decades of the nineteenth century, residential growth for the elite and upper middle classes was expanding southward from the Minneapolis CBD, and in a more circuitous but generally westward path out of downtown St. Paul. At its peak just before World War I, the central spine of the Twin Cities streetcar network presaged the full extent of this axis, stretching more than 40 miles from a modest resort and summer cottage settlement on White Bear Lake to a more upscale development on Lake Minnetonka (Figure 4.5). A legacy of the early optimism of the streetcar developers, this extensive network stimulated low-density residential growth, and reinforced the southwest axis of upper-middle class expansion that was to explode in the postwar building boom.¹³ The historical legacy of the amenity corridors remains strong today, with the living and working spaces of those engaged in the regional service economy inexorably gravitating toward the affluent markets of the south and west suburbs (Figure 4.6).¹⁴

The Changing Geography of Women's Employment

The composition of the labor force underwent dramatic changes as residential suburbanization accelerated in the years after World War II. After a brief interruption in the first decade after the war, women's labor force participation began its well-documented rise, increasing in the Twin Cities from less than 40 percent in 1960 to nearly 70 percent in 1990.

The Twin Cities exemplifies the national trend toward greater labor-force participation among all groups of women. The demographic profile of the average employed woman has been steadily changing since the turn of the century, as greater numbers of married women and mothers enter the workforce, and as all women remain in paid employment for longer periods. Yet these trends accelerated in the postwar era, vastly broadening the demographic character of the female workforce. In 1960, for instance, fewer than one in five mothers of young children were in the labor force; by 1990 this figure approached 70 percent (Table 4.1). Among

the Great Northern, and the Chicago, Burlington & Quincy railroads merged to become the Burlington Northern. See Borchert, J.R. (1987), *op. cit.*, pp. 152-4; and Adams, J.S., and B. VanDrasek (1993), *op. cit.*, pp. 38-40.

¹³Adams, J.S., and B. VanDrasek (1993), *op. cit.*, p. 81.

¹⁴See also Adams, J.S. (1991). "Housing submarkets in an American metropolis." In Hart, J.F., ed., *Our Changing Cities*. Baltimore and London: Johns Hopkins University Press, 108-26.

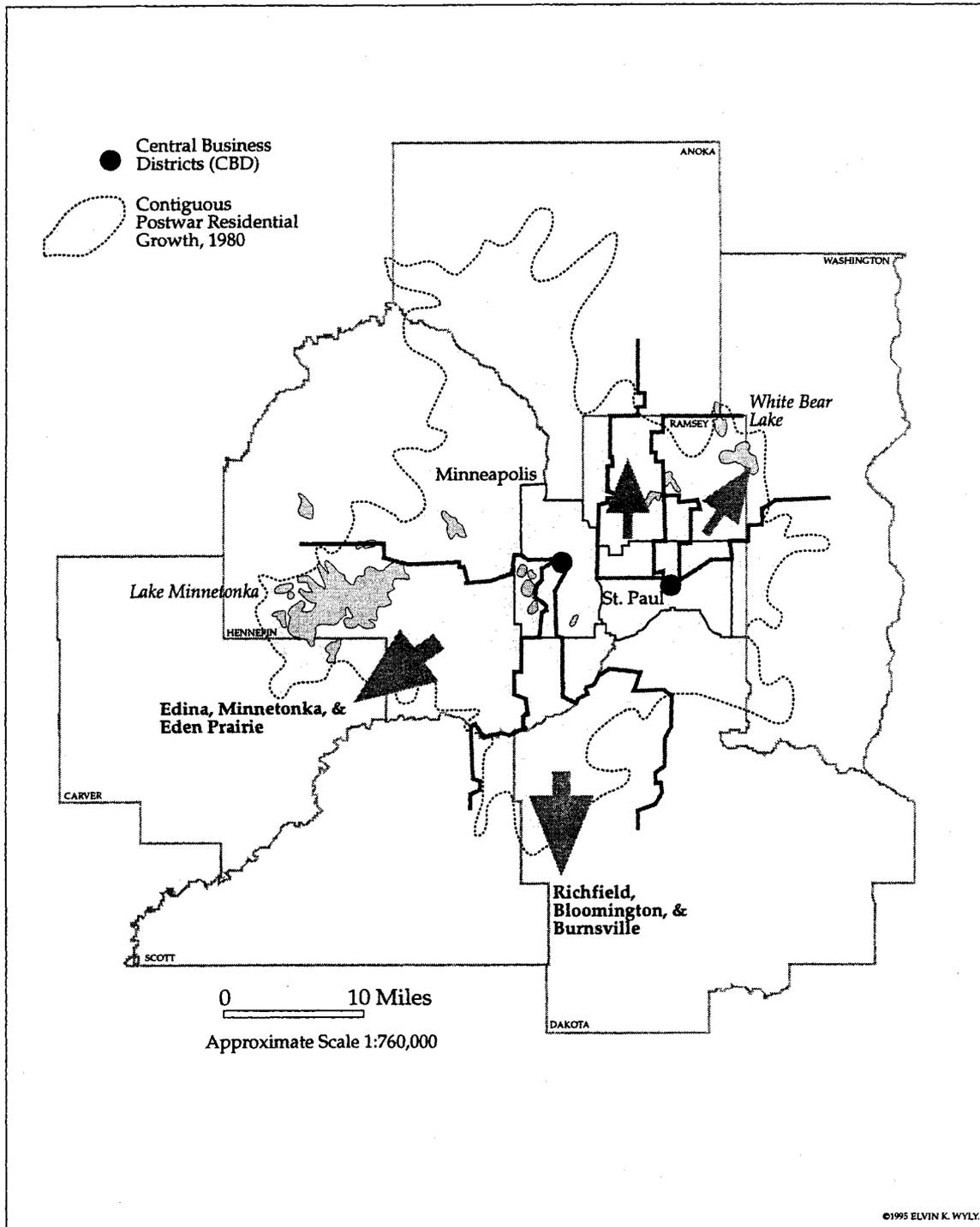


Figure 4.5. Twin Cities Lake and Amenity Axis. Sources: after Adams, J.S., and B. VanDrasek (1993). *Minneapolis-St. Paul: People, Place, and Public Life*. Minneapolis: University of Minnesota Press, Figure 35, p. 80, and Figure 45, p. 105; and Borchert, J.R. (1987). *America's Northern Heartland: An Economic and Historical Geography of the Upper Midwest*. Minneapolis: University of Minnesota Press, Figure 53, p. 154.

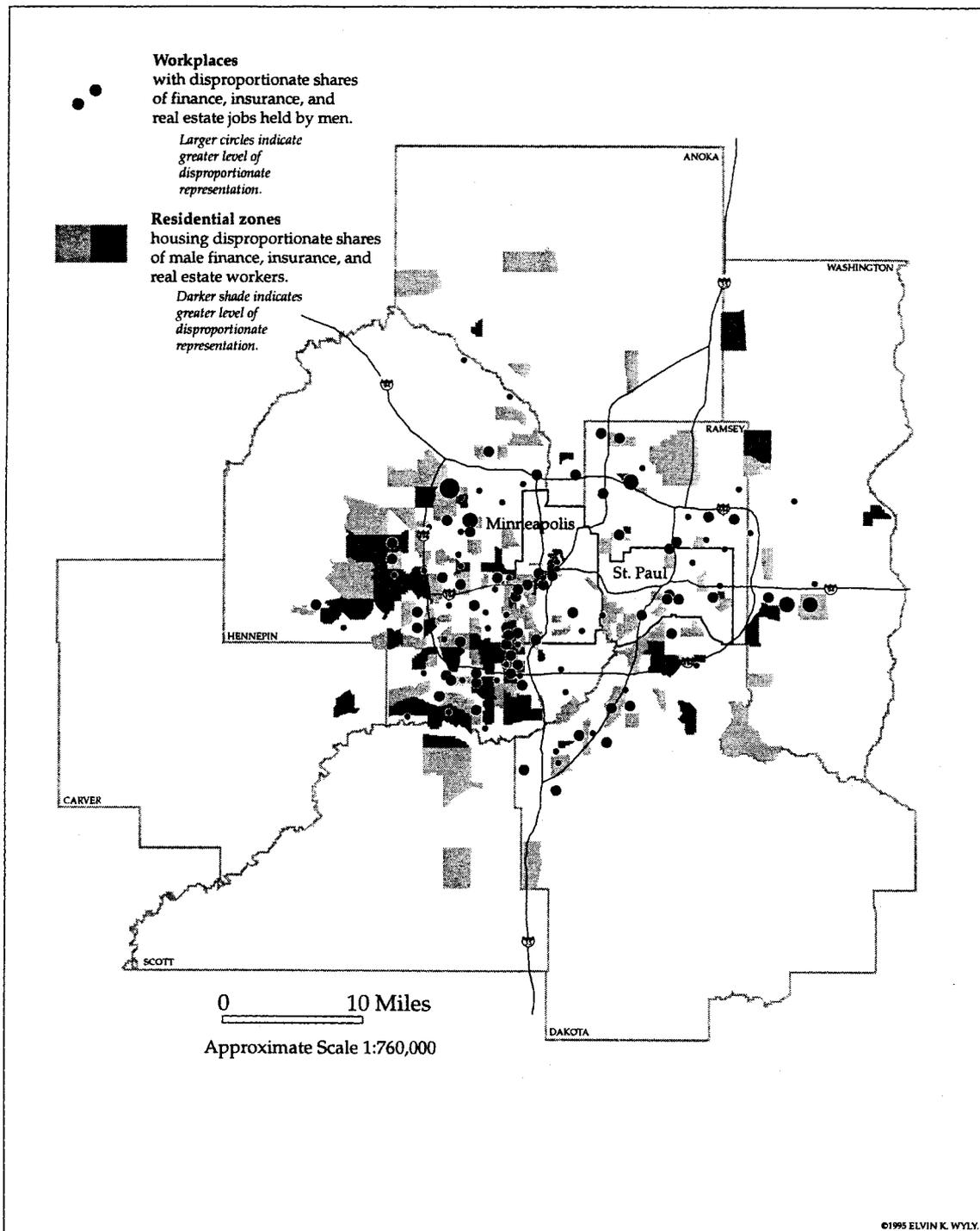


Figure 4.6. Twin Cities Regional Service & Consumption Realm. Source: Figure 5.18.

Table 4.1. Twin Cities Female Labor Force Participation, 1960-1990.

	1960		1970		1980		1990	
	MSA	CC	MSA	CC	MSA	CC	MSA	CC
Females aged 16 and over (1)	536,993	323,593	649,156	306,491	831,929	281,223	973,037	296,647
In labor force (female workforce)	213,982	142,797	317,291	151,890	499,427	159,511	654,893	166,345
Percent of total	39.8	44.1	48.9	49.6	60.0	56.7	67.3	56.1
Married, husband present	322,384	167,631	386,804	147,111	454,803	113,850
In labor force	104,511	58,561	169,673	64,466	264,961	63,419
Percent of total	32.4	34.9	43.9	43.8	58.2	55.7
Percent of female workforce	48.8	41.0	53.5	42.4	53.0	39.8
With own children under age 6	124,738	51,846	126,195	39,610	129,132	33,390	164,137	38,271
In labor force	22,001	10,423	37,488	13,125	67,537	17,627	113,077	23,453
Percent of total	17.6	20.1	29.7	33.1	52.3	52.8	68.9	61.3
Percent of female workforce	10.3	7.3	11.8	8.6	13.5	11.0	17.3	14.1

Notes:

1. Females aged 14 and over for 1960.
2. Not reported.

Data Source: U.S. Bureau of the Census (1962, 1972, 1983, 1992).
Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul.
 [Tables P-1, P-3 (1962); Table P-3 (1972); Table P-10 (1983); Table 18 (1992).]
 Washington, D.C.: U.S. Government Printing Office.

married women, only one in three was in the workforce in 1960, but three in five worked in 1990 (Table 4.1). Owing to declining fertility and marriage rates, married women with children remain a comparatively small segment of the female workforce; yet their entry into the labor market signifies dramatic changes in the relationship between home and work.

More significant has been the dramatic rise in labor force participation among suburban women. In 1950, female participation remained tied to the dense residential districts surrounding the urban cores of Minneapolis and St. Paul, and few women in the developing suburbs entered the workforce (Figure 4.2). By the end of the 1950s, one third of all suburban women were in the labor force, and married women comprised nearly two thirds of the female workforce in the suburbs (Table 4.1). The spatial patterning of women's employment remained highly centralized well into the 1960s, but participation rates were increasing throughout the suburban ring (Figure 4.7). With stagnating real incomes and changes in the composition of the "typical" American family, labor force participation among suburban women accelerated during the 1970s and 1980s (Figure 4.8; Figure 4.9). By 1990, the suburban ring included a wide range of participation rates, but four out of five women in the tier of developing suburbs were in the labor force (Figure 4.9).

Through the 1960s and 1970s participation rates remained low in some of the region's affluent suburbs and resort outposts. In 1970, fewer than one in three women were in the workforce in parts of Edina and Minnetonka (on the west side), and North Oaks and White Bear Lake (to the northeast) (Figure 4.8). With these notable exceptions, however, the entry of women into the labor force appears to have spanned the full spectrum of suburban neighborhoods. By the end of the 1960s, participation rates topped 50 percent throughout most of the first-ring suburbs, including solid middle-class enclaves in St. Louis Park, as well as more modest neighborhoods in Richfield, Brooklyn Center, and most of the blue-collar suburbs north of Minneapolis (Figure 4.8). The pattern of increasing participation also prevailed in outlying areas, as women in smaller towns (Anoka, Hastings) and peripheral townships (Plymouth and eastern Minnetonka) were drawn into the expanding metropolitan economy.

These trends have altered fundamental aspects of the social geography of the metropolis, and have undermined conventional theories of urban social structure.

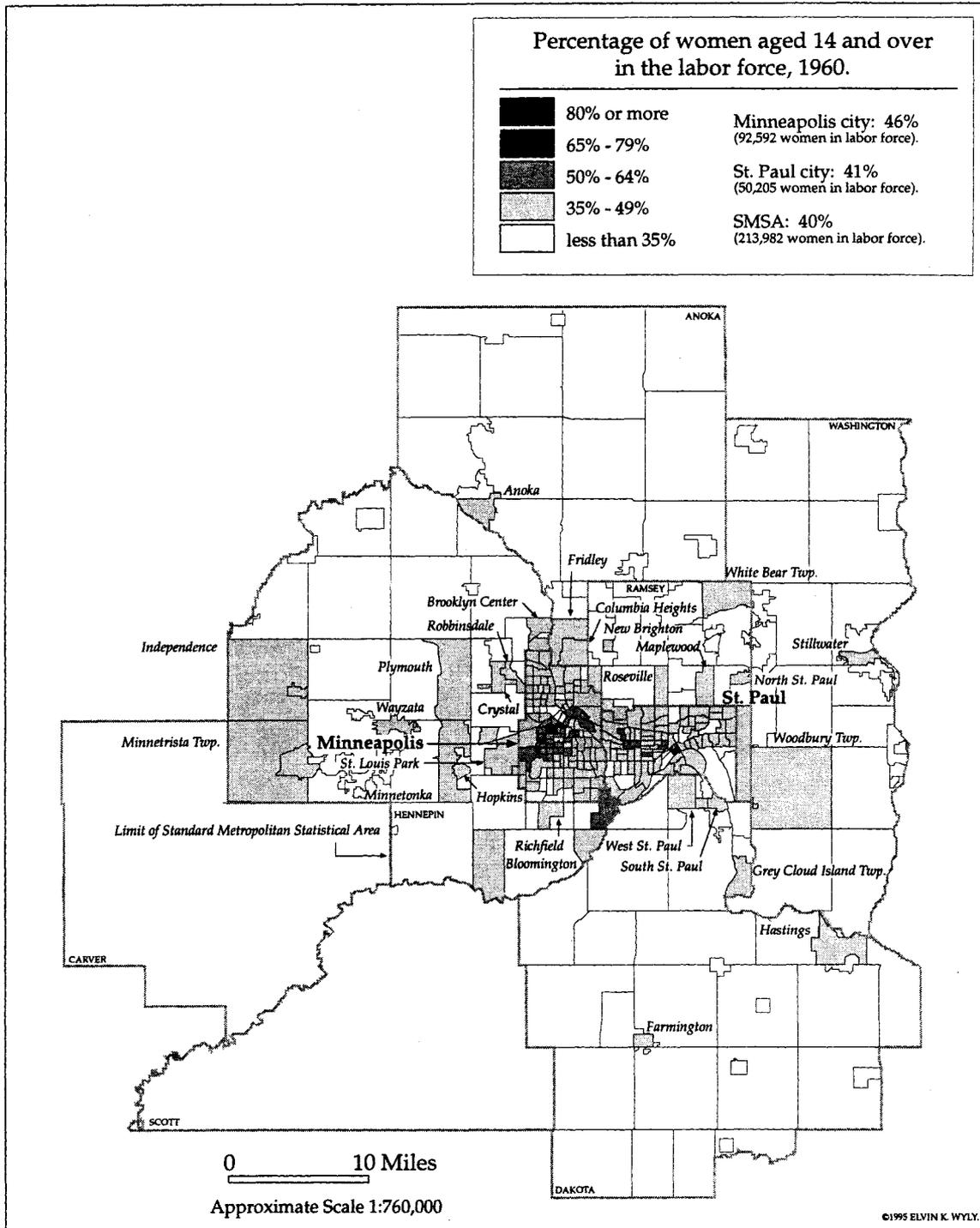


Figure 4.7. Female Labor Force Participation, 1960. Data Source: U.S. Bureau of the Census (1962). *1960 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul.* Washington, D.C.: U.S. Government Printing Office.

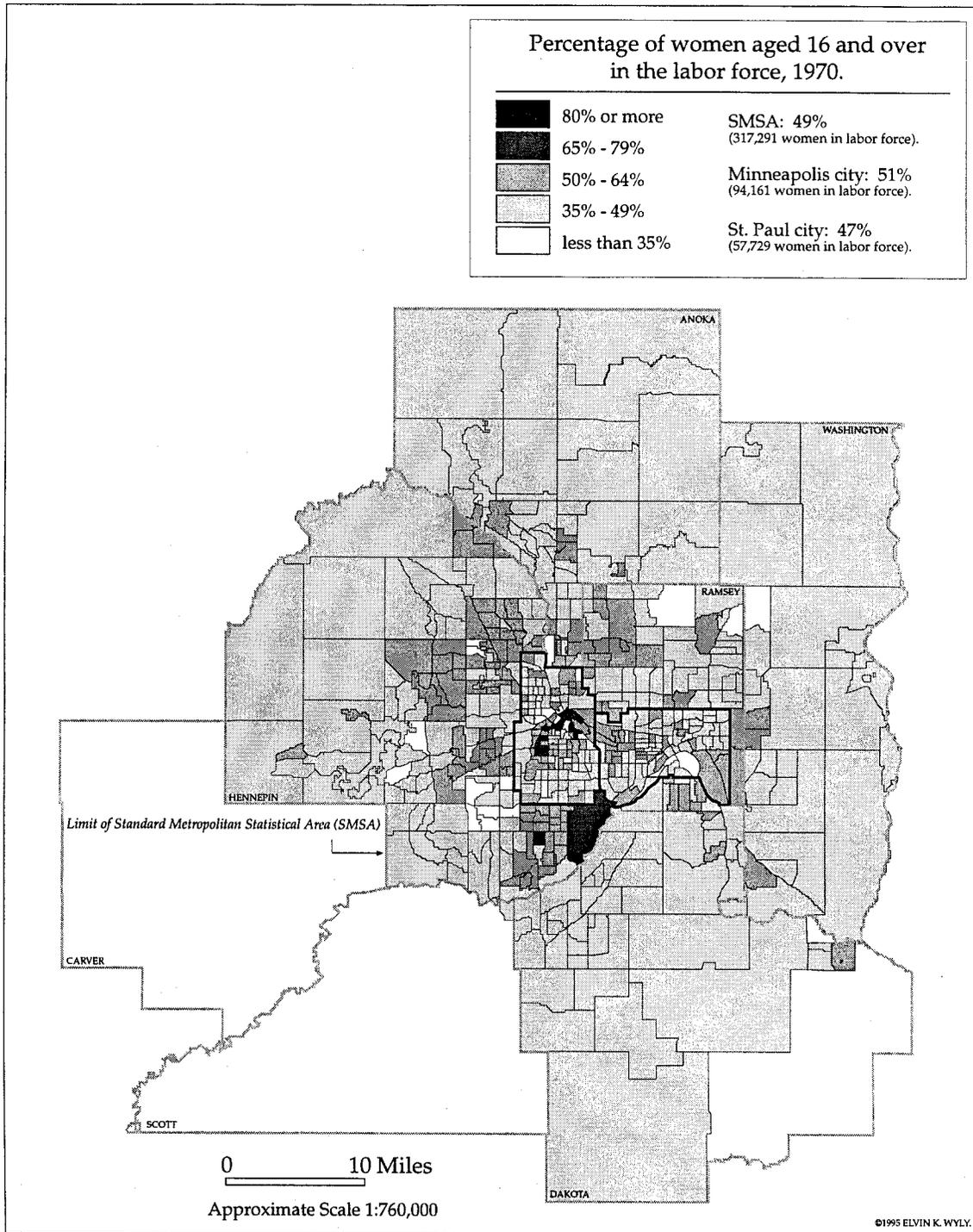


Figure 4.8. Female Labor Force Participation, 1970. Data Source: U.S. Bureau of the Census (1972). *1970 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul.* Washington, D.C.: U.S. Government Printing Office.

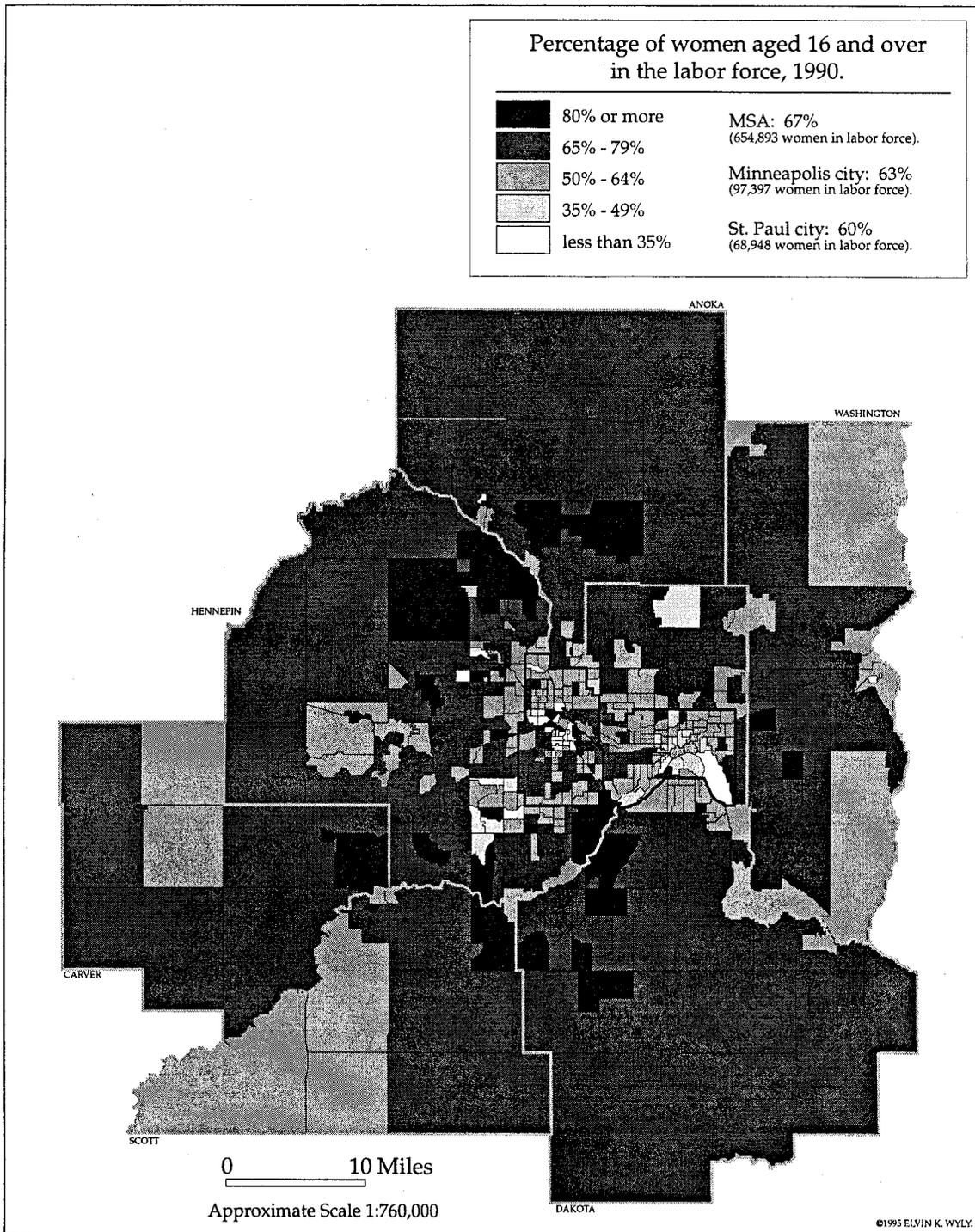


Figure 4.9. Female Labor Force Participation, 1990. Data Source: U.S. Bureau of the Census (1992). *1990 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul.* Washington, D.C.: U.S. Government Printing Office.

Through the 1970s, urban sociologists and geographers typically viewed female labor force participation as an indicator of the socio-spatial effects of postwar suburbanization.¹⁵ The automobile and generous federal subsidies opened vast tracts of residential land at the urban fringe to middle-class workers, and a sustained increase in birth rates intersected with unprecedented economic expansion. Consequently, the new suburbia developed with a relatively homogeneous social and spatial structure, in which male breadwinners commuted to downtown employment centers while mothers stayed at home. Women's employment thus provided a useful yardstick by which to gauge conformance to the prevailing cultural norms of suburbanization: female labor force participation either reflected a neighborhood of younger residents, the legacy of previous eras of urban growth, or a failure to conform to the middle-class suburban ideal.

The increasing employment of suburban, middle-class women in the 1960s and 1970s rendered this interpretation obsolete. Women across a broad range of the class structure have entered paid employment, and labor force participation no longer distinguishes different neighborhoods. These changes appear especially pronounced in the Twin Cities, where participation rates now exceed 80 percent in burgeoning middle-class suburbs and mature first-ring developments as well as historic downtown apartment districts (Figure 4.9). In sum, the increase in female labor force participation across the metropolis has blurred the archetypical dichotomy between the 'female suburb' of domesticity and the 'male city' of industrial work.¹⁶

The Current Picture

Today, the Twin Cities has one of the nation's highest female labor force participation rates, and women figure prominently in many aspects of the regional economy. Two of the metro area's counties rank among the nation's top 25 counties in terms of female labor force participation, with more than 72 percent in the workforce: Anoka County, with its broad swath of blue-collar and working-class neighborhoods north of Minneapolis, and Dakota County, the region's fastest-growing county in the 1980s.¹⁷ Two out of three women over age sixteen are in the

¹⁵Shevky, E., and W. Bell (1955). *Social Area Analysis*. Stanford: Stanford University Press; Timms, D. (1971). *The Urban Mosaic*. London: Cambridge.

¹⁶Saegert, S. (1980). "Masculine cities and feminine suburbs: Polarized ideas, contradictory realities." *Signs* 5(3) (supplement), S96-S111.

¹⁷U.S. Bureau of the Census (1994). *County and City Data Book*. Washington: U.S. Government

labor force, and women comprise 47 percent of the regional workforce.¹⁸

The importance of working women in the regional economy is reflected in other ways. With the passage of two laws in the early 1980s, Minnesota became the first state to pass comparable-worth legislation for all public-sector employees--some 14 percent of the state's workforce--and so a substantial share of the Twin Cities labor market is governed by gender-specific wage laws.¹⁹ The women's movement of the 1970s brought a proliferation of local organizations to deal with a wide variety of women's employment issues, from child care and maternity leave policy, to networking among women executives. Taken together, these organizations span the range of class constituencies, from low-income single mothers to upper-middle class professionals. The Minnesota chapter of the National Association of Women Business Owners, for instance, grew to more than 75 members within a year of its inception in 1977. By 1980, the Minnesota Women's Network (founded by a group of prominent businesswomen who dubbed themselves "All the Good Old Girls") had grown to more than 2,000 members.²⁰ In the mid-1980s, a Bloomington-based company advertised itself as "the country's first full-service human-resource firm focused exclusively on recruiting women," and the metro area was ranked among the "Best of the Best" U.S. cities for working women.²¹

Despite the apparent prominence of women in the public realm, the metropolitan labor market remains deeply segmented. The region's occupational and industrial profile reveals overlapping, yet distinct segments partitioned along both gender and racial lines (Table 4.2). White men are distributed throughout most of the occupational and industrial structure. Both Black and White women, however, remain disproportionately concentrated in poorly-paid service industries and support occupations. Nearly 60 percent of all women work in occupations in which female workers are over-represented. Nearly one third of all women work in

Printing Office, p. xviii.

¹⁸U.S. Bureau of the Census (1992). *1990 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul*. Washington, D.C.: U.S. Government Printing Office.

¹⁹Evans, S.M., and B.J. Nelson (1989). *Wage Justice: Comparable Worth and the Paradox of Technocratic Reform*. Chicago: University of Chicago Press.

²⁰Gelbach, D.L. (1985). "No more lonely fights." *Minnesota Business Journal*, November, p. 26.

²¹Career Woman's World, Inc. advertised its services thus: "Have you ever said, 'I'd really like to hire a woman for that position, but I just can't find one'? Today, WE can do it for you!" *Minnesota Business Journal*, November 1985, p. 33. Minneapolis and St. Paul are ranked "Excellent" in advantages for two-earner couples; Fraser, J.A. (1986). *The Best U.S. Cities for Working Women*. New York: New American Library, pp. 59-63.

Table 4.2. Twin Cities Labor Market Segmentation, 1990.
(a) by Industry

Industry Groups	INGRP	All Workers		White Men		White Women		Black Men		Black Women	
		%	Ratio	%	Ratio	%	Ratio	%	Ratio	%	Ratio
Extractive	1	6.3	10.5	1.67	2.0	0.32	3.6	0.57	1.5	0.24	
Nondurable Goods Manufacturing	2	7.8	9.2	1.18	6.2	0.79	6.8	0.87	4.8	0.62	
Durable Goods Manufacturing	3	12.2	16.2	1.33	7.6	0.62	13.4	1.10	7.1	0.58	
Transportation, Communications, & Utilities	4	7.3	9.5	1.30	4.9	0.67	10.0	1.37	4.5	0.62	
Wholesale Trade	5	5.6	7.4	1.32	3.9	0.70	5.3	0.95	2.1	0.38	
Retail Trade	6	16.5	15.0	0.91	18.2	1.10	15.1	0.92	13.4	0.81	
Finance, Insurance, and Real Estate	7	8.3	6.1	0.73	10.7	1.29	5.4	0.65	11.0	1.33	
Business Services	8	5.6	6.2	1.11	4.8	0.86	10.7	1.91	5.0	0.89	
Personal & Entertainment Services	9	4.0	3.1	0.78	4.9	1.23	4.9	1.23	5.0	1.25	
Professional Services	10	23.2	13.5	0.58	33.7	1.45	20.3	0.88	40.8	1.76	
Public Administration	11	3.2	3.3	1.03	3.1	0.97	4.5	1.41	4.8	1.50	
		100.0	100.0		100.0		100.0		100.0		
Sample Size		41,151	20,679		18,616		469		336		

Notes: 1.33 Highlighted cells indicate occupation/industry groups "typical" for gender/racial group. Typical categories defined as those in which gender/racial group is more than one-third over-represented.

Table 4.2. (Continued).
(b) by Occupation

Occupation Groups	OCCGRP	All Workers		White Men		White Women		Black Men		Black Women	
		%	Ratio	%	Ratio	%	Ratio	%	Ratio	%	Ratio
Executive & Administrative	1	14.4	16.2	1.13	12.8	0.89	10.7	0.74	10.7	0.74	
Engineers & Scientists	2	3.3	5.2	1.58	1.3	0.39	2.6	0.79	0.6	0.18	
Health diagnosing & Assessing	3	3.1	1.7	0.55	4.8	1.55	0.6	0.19	1.8	0.58	
Postsecondary Teachers	4	0.1	0.1	1.00	0.1	1.00	0.2	2.00	0.3	3.00	
Teachers, n.e.c.	5	3.5	2.0	0.57	5.2	1.49	3.2	0.91	5.4	1.54	
Other Managerial occupations	6	4.8	4.7	0.98	5.0	1.04	4.7	0.98	4.4	0.92	
Health technicians	7	1.1	0.2	0.18	2.0	1.82	0.0	0.00	2.4	2.18	
Other technicians	8	3.4	4.6	1.35	1.9	0.56	2.6	0.76	3.3	0.97	
Sales representatives & Supervisors	9	7.7	10.0	1.30	5.4	0.70	5.8	0.75	3.0	0.39	
Sales workers	10	5.4	3.9	0.72	7.1	1.31	4.1	0.76	7.1	1.31	
Administrative support Supervisors	11	0.8	0.5	0.63	1.2	1.50	0.0	0.00	0.3	0.38	
Administrative support workers	12	17.5	6.9	0.39	29.3	1.67	9.8	0.56	31.5	1.80	
Services, except protective	13	11.1	7.0	0.63	14.8	1.33	20.0	1.80	21.1	1.90	
Protective Services	14	1.0	1.6	1.60	0.4	0.40	4.7	4.70	0.3	0.30	
Farming, Forestry, and Fishing	15	1.2	1.8	1.50	0.6	0.50	0.6	0.50	0.6	0.50	
Mechanics	16	2.9	5.4	1.86	0.3	0.10	2.3	0.79	0.3	0.10	
Construction Trades	17	3.2	6.0	1.88	0.2	0.06	1.9	0.59	0.0	0.00	
Precision Production	18	3.4	5.2	1.53	1.5	0.44	2.6	0.76	1.2	0.35	
Operators	19	3.2	4.0	1.25	2.0	0.63	5.5	1.72	2.4	0.75	
Fabricators	20	2.6	2.8	1.08	2.2	0.85	4.9	1.88	2.4	0.92	
Transport Occupations	21	3.2	5.6	1.75	0.6	0.19	4.9	1.53	0.3	0.09	
Handlers & Laborers	22	3.1	4.6	1.48	1.3	0.42	8.3	2.68	0.6	0.19	
Total		100.0	100.0		100.0		100.0		100.0		
Sample Size		41,151	20,679		18,616		469		336		

Data Source: U.S. Bureau of the Census (1992). Public-Use Microdata Sample, 1990 Census of Population and Housing. Five percent sample.
[Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

a single job category--administrative support (Table 4.2).

Conclusions

Several factors have created a unique local setting in which to examine the intersection of gender and social class in the formation of local labor markets. The Twin Cities' spatial structure exemplifies many of the features of conventional urban models, providing an opportunity to evaluate the formation of geographically-differentiated labor markets. The region's vibrant growth, particularly in the service sector, has promoted an almost uninterrupted rise in female labor force participation, especially among married women and mothers. Finally, the high rates of participation among women in a broad range of suburban neighborhoods affords an opportunity to examine the relations between social class and women's employment experiences. Taken together, these contextual effects permit an unusually clear focus on the geographical dimensions of women's employment. In the next chapter, I sketch the outlines of spatial labor markets for men and women, examining the distribution of different kinds of employment opportunities across the urban fabric.

CHAPTER FIVE

GENDER AND THE GEOGRAPHICAL STRUCTURE OF LOCAL LABOR MARKETS

Introduction

The geographical structure of local labor markets is the outcome of a complex locational interdependency among workers and firms, reflecting the interplay of the knowledge, choices, and constraints of employers and wage earners. The dynamic spatial sorting of workers and firms within urban space has been at the heart of the development and growth of the large American metropolis, and since the middle of this century has formed the mainstay of geographical research on industrial location, residential mobility, and the journey-to-work.

Conventional urban theory explains the formation of distinct spatial labor markets primarily in terms of economic relations at the workplace. Divisions among different groups of workers in the realm of production govern the emergence of urban social patterns in residential space, via the uneven allocation of resources. Theories drawn from neoclassical economics couch this explanation in terms of individual choice: workers choose residences and workplaces from an array of alternatives, minimizing the cost and inconvenience of the worktrip while balancing other locational considerations, such as the characteristics of the housing unit and its surrounding neighborhood.¹ Given the differential resources and preferences of workers of varying socioeconomic status, the aggregate choices made by workers in different positions in the overall division of labor create the internal differentiation of the city.

By contrast, structuralist theories emphasize the role of conflicts between capital and labor in determining the set of choices available to individual actors. Initially, structuralist work focused on employers' use of locational strategies to challenge labor organization,² how spatially-concentrated labor demand calls forth "a labor force that embodies the skills and other attributes required by local

¹Alonso, W. (1964). *Location and Land Use: Towards a General Theory of Land Rent*. Cambridge, MA: Harvard University Press. Muth, R. (1969). *Cities and Housing*. Chicago: University of Chicago Press.

²Peet, R. (1984). "Class struggle, the relocation of employment, and economic crisis." *Science and Society* 48(1), 38-51; Clark, G. (1981). "The employment relation and the spatial division of labor: A hypothesis." *Annals of the Association of American Geographers* 71, 412-24; Walker, R. (1981). "A theory of suburbanization: Capitalism and the construction of urban space in the United States." In Dear, M., and A. Scott, eds., *Urbanization and Urban Planning in Capitalist Societies*. New York: Methuen, 383-430.

employers,"³ and how "industries produce regions" rather than *vice versa*. Subsequent work examined firms' reliance on existing spatial divisions in the labor force: employers must seek out locations that are accessible to a suitable labor force, balancing such considerations with other locational criteria, such as land availability, access to inputs and markets, and so forth.⁴ By locating so as to avail themselves of a suitable quantity and type of labor, firms collectively determine the range of employment opportunities available to workers in different neighborhoods--reinforcing patterns of residential differentiation and other divisions among workers.⁵ Thus while incorporating the influence of existing social and spatial divisions on industrial location, structuralist explanations continue to privilege the role of capital and class in structuring urban social space.

In recent years feminist geographers have challenged many of the central assumptions of both neoclassical and structural theories. First, feminists argue that the dramatic rise in female labor force participation since the Second World War violates the basic assumptions of conventional models, which typically identify (male) household heads' locational choices as the root of urban social patterns. Conventional models provide poor results, for instance, if dual-earner households consider the workplace locations for *both* spouses when evaluating residential options;⁶ conversely, gender roles within the household may restrict women's options if dual-earner families select residences primarily according to the husband's locational criteria.⁷

The second feminist critique concerns the nature and "direction" of the causal relations between home and work. Recent structuralist theories *do* consider the effect of variations in the residential landscape on firms' locational behavior. Yet these theories still emphasize the determinate role of workplace-based class relations in residential differentiation and the formation of distinct local labor markets. The division (in the realm of production) between blue- and white-collar

³Storper, M., and R. Walker (1989). *The Capitalist Imperative: Territory, Technology, and Industrial Growth*. New York: Basil Blackwell, p. 178.

⁴Scott, A.J. (1988). *Metropolis: From the Division of Labor to Urban Form*. Berkeley: University of California Press.

⁵Harvey, D. (1985). *The Urbanization of Capital*. Baltimore: Johns Hopkins University Press.

⁶Curran, C., C.A. Carlson, and D.A. Ford (1982). "A theory of residential location decisions of two-earner households." *Journal of Urban Economics* 12, 102-14.

⁷Singell, L.D., and J. Lillydahl (1986). "An empirical analysis of the commute to work patterns of males and females in two-earner households." *Urban Studies* 2, 119-29.

workers, for example, is said to assume spatial form in the matrix of residential neighborhoods, which in turn promote the smooth inter-generational transfer of skills, expectations, and work experiences essential for the reproduction of the workforce as a whole.⁸ For feminist geographers Susan Hanson and Geraldine Pratt, this line of reasoning privileges a narrow definition of social class while suppressing the issue of gender. If the formation of local labor markets is rooted in workplace-based class relations, then the entire argument rests on showing that women's experiences of class in the workplace are similar to those of men; the thesis also requires evidence that the *geography* of these relations do not differ substantially for men and women.

The empirical evidence fails to support these expectations, however, and feminists have shown that gender mediates many labor-market processes. Women typically retain a more tenuous attachment to the paid labor force than men, interrupting their work careers for marriage and/or childbirth, and so the class experiences of married women may be heavily mediated by those of men.⁹ Working women remain segregated into lower-paying, lower-status jobs, and nearly half of all women work in occupations in which more than 70 percent of the incumbents are female.¹⁰

Segmented labor market (SLM) theorists have shown how a variety of factors help to reinforce and perpetuate these divisions, but for geographers the central question concerns the spatial patterns associated with segmentation processes. If women across the city share similar positions in the occupational structure--single mothers living in inner-city districts as well as married wives living in upper-middle class suburbs--then the central assumption of conventional theory is violated. Neighborhoods homogeneous in terms of men's social class may be

⁸Harvey, D. (1985), *op. cit.*, Chapter 5.

⁹This point involves a longstanding sociological debate over the class consciousness of married women. See Wright, E.O. (1987). "Women and the class structure." *Politics and Society* 17(1), 35-66. There is also some debate over trends regarding women's attachment to the paid labor force. See Pratt, G., and S. Hanson (1993). "Women and work across the life course: Moving beyond essentialism." In Katz, C., and J. Monk, eds. *Full Circles: Geographies of Women over the Life Course*. New York: Routledge, 27-54.

¹⁰Hanson, S., and I. Johnston (1985). "Gender differences in worktrip length: Explanations and implications." *Urban Geography* 6, p. 194.

considerably more diverse when considering women's labor-market experiences.¹¹ Conversely, if women from across the metropolis work in similar "pink-collar" clerical jobs, then the division between working-class and middle-class neighborhoods may fail to describe the geography of social class for women.

These feminist critiques point to substantial disjunctures in the geography of men's and women's employment, and suggest far-reaching theoretical implications. Yet with few exceptions,¹² analysts fail to analyze the differences between men's and women's employment at a fine spatial scale, leaving the relations between gender and local labor markets shrouded in mystery. Research on the processes that create and sustain divisions in the workforce reveal the rigidity of occupational sex segregation, for example, but scholars know little of the fine-grained geographical patterns of "men's work" and "women's work." Statistical analyses of commuting patterns continue to dominate empirical research on women's employment, with studies focusing on the behavioral explanations for women's shorter worktrips. While providing valuable insights, the narrow focus on worktrip length ignores the fine-grained variation of men's and women's workplaces across different parts of the metropolis. Moreover, feminist research has shifted away from the analysis of empirically-observed spatial patterns, to the formation of place-based identities among different groups of women, and between women and other marginalized groups.¹³ As a consequence, theories of gender divisions in local labor markets rely on small or non-comparable samples of narrow segments of the workforce,¹⁴ or on censuses or surveys conducted prior to the urban restructuring of the 1980s.

¹¹The first elaboration of this argument, which to my knowledge has not subsequently been pursued, is Pratt, G., and S. Hanson (1988). "Gender, class, and space." *Environment and Planning D: Society and Space* 6, 15-35.

¹²The best example of replicable research on the geography of women's employment is Hanson, S., and G. Pratt (1988). "Spatial dimensions of the gender division of labor in a local labor market." *Urban Geography* 9, 180-202.

¹³For a recent review, see Bondi, L. (1992). "Gender and dichotomy." *Progress in Human Geography* 16(2), 157-70. Hanson, S., and G. Pratt (1994). "Geography and the construction of difference." *Gender, Place, and Culture* 1(1), 5-29.

¹⁴The most prominent examples of this limitation are two opposing interpretations of the geography of female clerical employment. Nelson, K. (1986). "Labor demand, labor supply, and the suburbanization of low-wage office employment." In Scott, A., and M. Storper, eds., *Production, Work, Territory*. Boston: Allen and Unwin, 149-71. England, K.V.L. (1993). "Suburban pink collar ghettos: The spatial entrapment of women?" *Annals of the Association of American Geographers* 83, 225-42.

In this chapter, I sketch an outline of the geographical patterns that both reflect and reinforce gender differences in the labor market. First, I examine the fine-grained spatial variation in workplaces for men and women, drawing on the three databases described in Chapter 3. Cartographic analysis of the dual-earner Travel Behavior Inventory (TBI) sample demonstrates that gender differences in worktrip length signify subtle differences in the shape of labor markets for men and women. When viewed at the scale of the metropolitan area, the spatial configuration of women's employment departs only slightly from that of men. Viewed at a fine-grained spatial scale, however, the pattern reveals highly localized variations in the shape of labor markets for men and women in dual-earner households.

Second, I evaluate the spatial distribution of different kinds of employment opportunities across the metropolitan area, drawing on the Census Transportation Planning Package (CTPP) database. The pattern of female-dominated employment zones suggests clear spatial manifestations of women's labor-market segmentation, with substantial numbers of women traveling to health care facilities, government jobs, and private-sector clerical jobs throughout the metropolis. In occupations and industries traditionally associated with "women's work," women's labor markets appear significantly more diffuse than men's in the same sector. An opposite pattern prevails in male-dominated occupations, where women's entry into nontraditional jobs apparently requires commutes to well-defined employment districts. Finally, I evaluate the degree to which earnings opportunities vary across local labor markets, drawing on the PUMS dual-earner database. While place of work exerts no significant effect on the average earnings of husbands, women's opportunities diverge substantially across the metropolitan area--even when controlling for part-time employment and job type.

Where the Work Journey Ends

Despite the growing body of literature on gender differences in the journey-to-work, the locational patterns of men's and women's commuting patterns generally remain *terra incognita*. Analysts typically focus on the mean, median and mode of men's and women's worktrips, and relate these patterns to hypothesized structural or behavioral processes thought to govern the formation of gender-specific local labor markets. Thus we know little about the shape and scale of the geographical patterns traced out by men's and women's worktrips. How do the

observed worktrips of men and women correlate with underlying differences in the structure of local labor markets in the metropolis?

To examine this question I draw on the TBI and CTPP databases described in Chapter 3. First, I examine the distribution of workplaces for men and women in dual-earner households. I focus on the pattern of employment centers with at least 1,000 jobs for men and women, respectively, thereby highlighting the top portion of the hierarchy of workplaces. Second, I analyze the residential and workplace locations of men and women for the workforce as a whole. I delineate male- and female-dominated labor markets by highlighting residential zones in which men or women comprise more than 55 percent of the entire workforce, and workplace zones in which more than 55 percent of all workers are of one sex. Finally, I examine the distribution of workplaces for men and women living in different parts of the metropolitan area, exposing marginal but significant variations in local labor markets.

Mapping employment centers for the TBI dual-earner database reveals subtle differences in the commuting patterns of men and women (Figure 5.1; Figure 5.2). In the main, men's and women's worktrips trace out remarkably similar commutesheds, with the top-ranked destinations including the twin downtown cores, the international airport, and the Minneapolis campus of the University of Minnesota.

Yet subtle variations in these patterns suggest underlying gender differences in the employment landscape. Nearly twelve percent of women in the sample work in one of the two downtown cores, compared with only nine percent of men. Similarly, 2.4 percent of women commute to jobs at the University, compared with less than 1.6 percent of men. The patterns also reflect functional differences of employment centers. For men, more than a dozen employment centers cluster in the rail and industrial corridors stretching north from Minneapolis and from St. Paul's Midway district, together comprising more than 5 percent of all jobs for men in the sample. No employment centers appear in these areas for women, with the exception of a clerical facility in the Midway district.¹⁵ Instead, women's workplaces

¹⁵The University of Minnesota maintained an Administrative Services Center along University Avenue until the early 1990s, creating a highly localized demand for female clerical workers in an otherwise masculine landscape of manufacturing, wholesaling, and transportation.

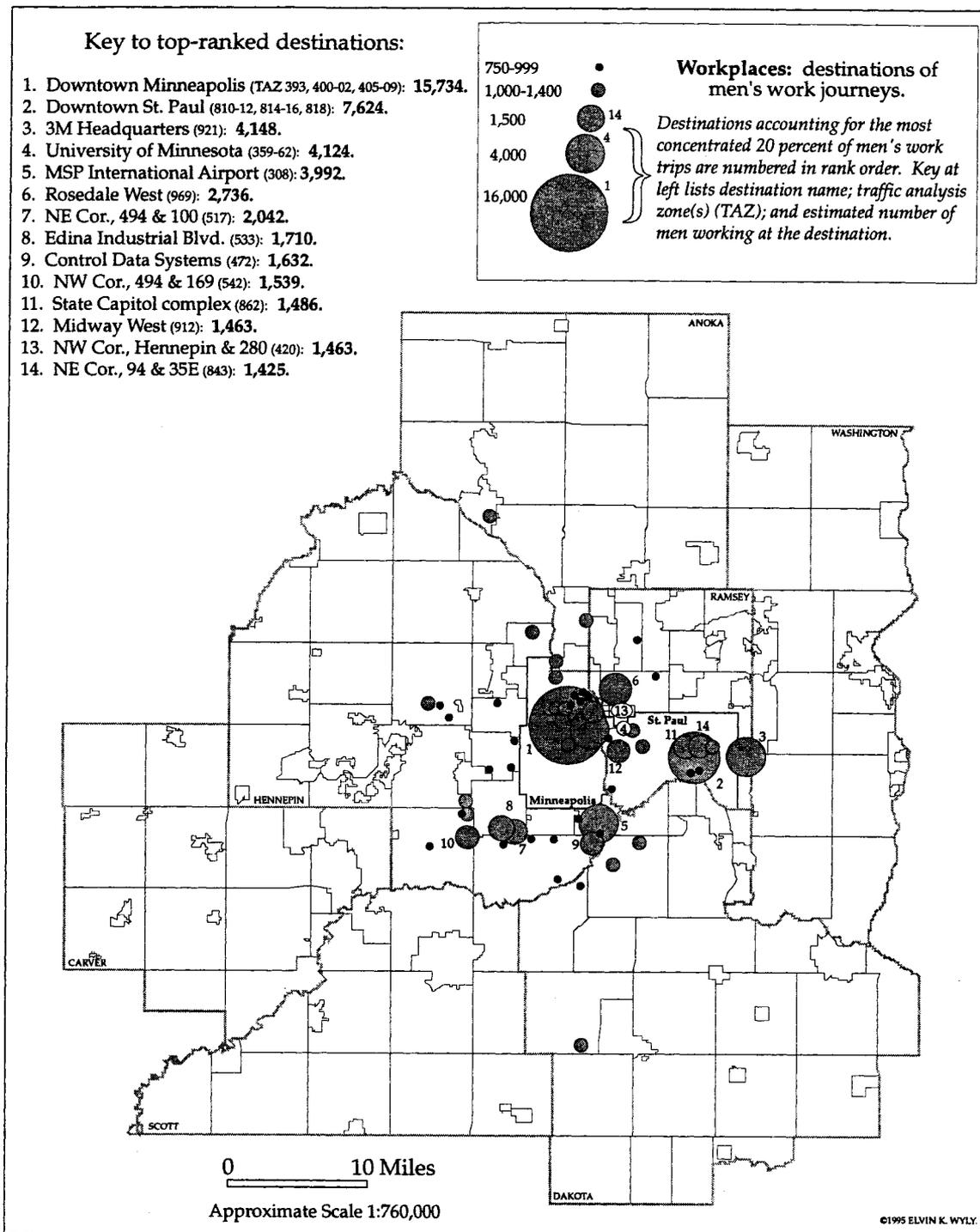


Figure 5.1. Workplaces, Men in Dual-Earner TBI Households. Data source: Metropolitan Council (1992), *Travel Behavior Inventory, Home Interview Survey*. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.

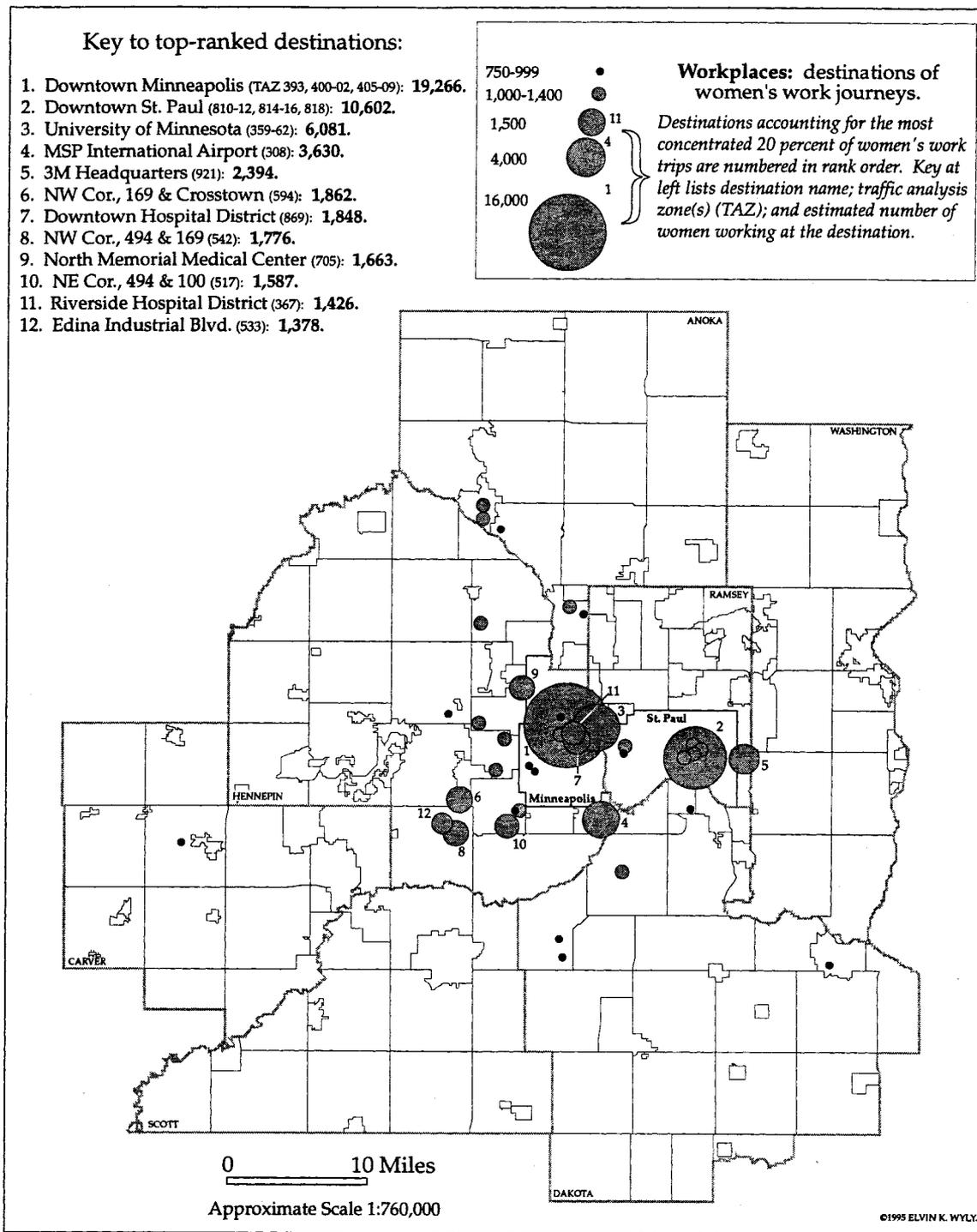


Figure 5.2. Workplaces, Women in Dual-Earner TBI Households. Data Source: Metropolitan Council (1992), *Travel Behavior Inventory, Home Interview Survey*. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.

cluster in the agglomeration of health care facilities south and east of downtown Minneapolis, comprising just under 2 percent of all jobs for women in the sample.

Geographical Variation of Commuting Patterns

An examination of selected employment centers provides a more detailed portrait of the patterns inscribed by men's and women's daily worktrips. I aggregate individual traffic analysis zones to a set of 22 employment areas, defined in order to highlight job concentrations in the core of the urbanized area, along major suburban freeway corridors, and in commercial areas in inner-ring suburbs and small towns toward the outskirts of the metropolitan area (Figure 5.3; Table 5.1). I code the workplace zone reported by men and women in the dual-earner TBI sample, comparing the expanded estimates with the summary tabulations of total employment drawn from the CTPP database.

The distribution of employment for dual-earner households follows closely that of the workforce as a whole (Table 5.1). While the two databases are not strictly comparable,¹⁶ this tabulation confirms that a focus on dual-earner households captures a rather broad segment of the workforce.

¹⁶Both the TBI and CTPP provide reasonable estimates of the distribution of employment across the metropolitan area, but discrepancies between the files reflect two fundamental differences in sample selection and survey design. First, survey respondents were selected according to different algorithms. For the CTPP, the Census Bureau tabulated responses to the long-form questionnaire, which was distributed to roughly one fifth of the national population according to a detailed social- and spatial-stratification procedure. For the TBI, respondents were randomly selected from a list of telephone numbers provided for each of the seven counties in the study area. The TBI database, therefore, is spatially-stratified only to the county level, introducing a substantial level of spatial sampling error into analyses performed at the tract or TAZ level. The second difference between the two databases involves the definition of "place of work" for employed respondents. For the long-form census questionnaire, respondents provided the address of the place at which they worked most often during the week prior to census day, 1990--not including workers absent due to "illness, bad weather, industrial dispute, vacation, or other personal reasons." The Home Interview Survey includes no such distinctions. The differences between the CTPP and TBI tabulations are most pronounced at the main terminal of Minneapolis-St. Paul airport, where the dual-earner sample accounts for more workers (7,624) than total employment (6,491). In addition to spatial sampling biases and non-comparable definitions, this discrepancy may also reflect "footloose" employment at the airport (taxi and limousine drivers, couriers, etc.) or improper coding of workplaces for airport workers employed outside the main terminal. See Metropolitan Council (1992). *Home Interview Survey, Methodology and Results*. [Technical documentation.] St. Paul, MN: Metropolitan Council; U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing*. [Technical documentation.] Washington, D.C.: U.S. Government Printing Office.

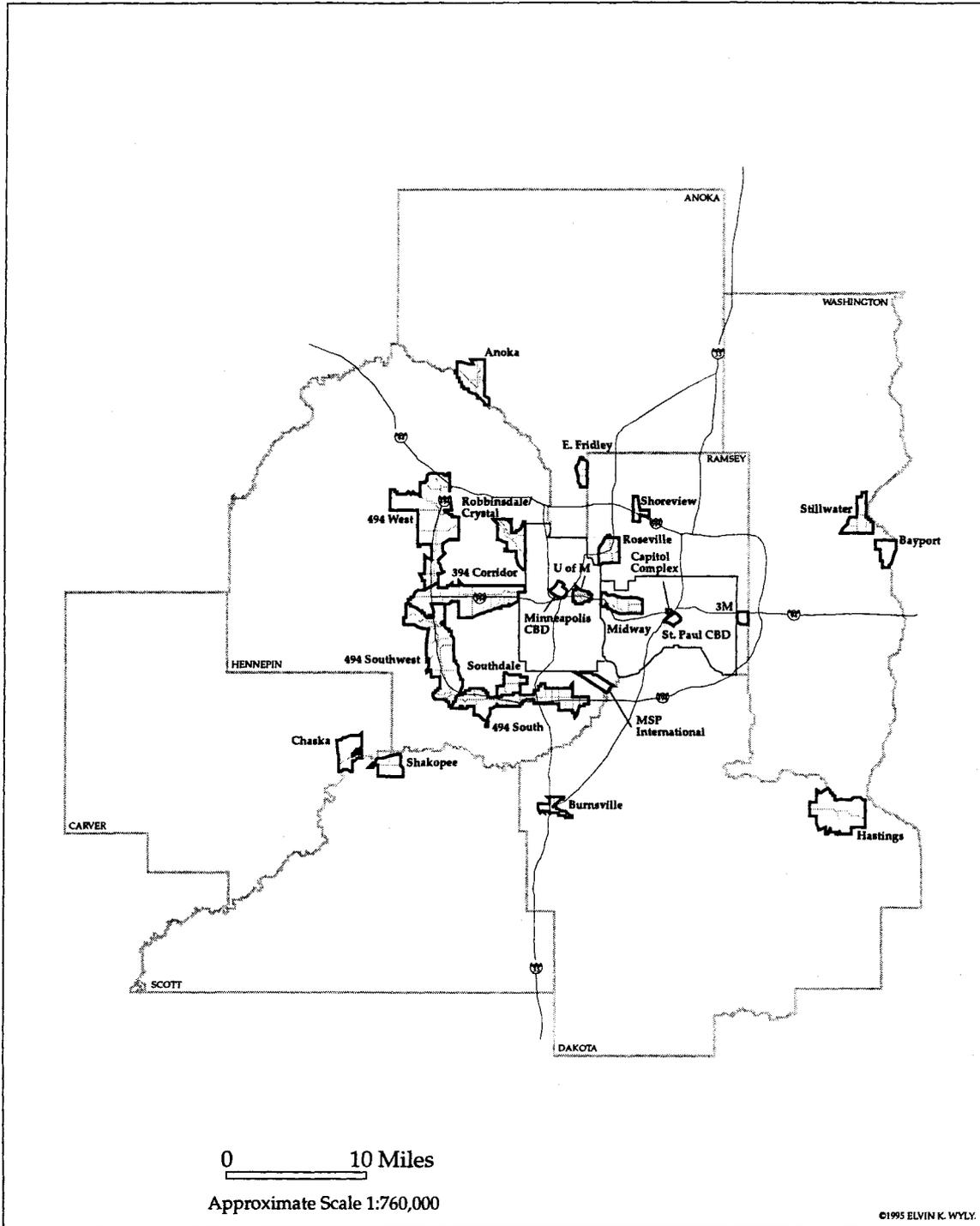


Figure 5.3. Major Job Concentrations. Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package, 1990 Census of Population and Housing.* [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

Table 5.1. Employment in Major Job Concentrations,
All Workers and Dual-Earner TBI Sample.

<i>Employment by Area:</i>	Total Employment				Dual-Earner Sample			
	Men		Women		Men		Women	
	Number	%	Number	%	Number	%	Number	%
Primary Employment Core								
Minneapolis CBD	51,925	7.7	52,746	8.9	17,286	6.8	20,883	8.2
University of MN (Mpls.)	8,262	1.2	10,926	1.8	4,125	1.6	6,080	2.4
MSP International Airport*	4,308	0.6	2,183	0.4	3,993	1.6	3,631	1.4
St. Paul CBD	20,793	3.1	22,981	3.9	7,626	3.0	10,605	4.2
St. Paul Midway	17,797	2.6	12,882	2.2	5,423	2.1	4,730	1.8
Subtotal	103,085	15.2	101,718	17.1	38,453	15.1	45,929	18.0
Suburban Freeway Corridors								
3M Headquarters	6,314	0.9	3,360	0.6	4,148	1.6	2,393	0.9
Southdale	8,882	1.3	9,163	1.5	2,940	1.2	3,450	1.4
494 South	24,372	3.6	21,336	3.6	12,464	4.9	9,065	3.6
494 Southwest	8,506	1.2	7,520	1.3	3,425	1.3	3,673	1.4
494 West	10,023	1.5	6,546	1.1	2,879	1.1	1,337	0.5
394 Corridor	14,260	2.1	15,072	2.5	5,209	2.0	5,984	2.3
Subtotal	72,357	10.7	62,997	10.6	31,065	12.2	25,902	10.1
Subsidiary/Outlying Employment Centers								
Anoka	*		*		*		*	
Bayport	3,042	0.4	1,219	0.2	527	0.2	271	0.1
Burnsville Center	2,264	0.3	3,552	0.6	878	0.3	2,353	0.9
Chaska	2,232	0.3	2,410	0.4	461	0.2	417	0.2
Fridley East	3,430	0.5	2,367	0.4	1,785	0.7	2,187	0.9
Hastings	3,479	0.5	4,330	0.7	777	0.3	1,525	0.6
Robbinsdale/Crystal	3,825	0.6	5,677	1.0	1,957	0.8	2,284	0.9
Rosedale	8,325	1.2	3,930	0.7	4,488	1.8	1,692	0.7
Shakopee	3,827	0.6	2,579	0.4	727	0.3	777	0.3
Shoreview	4,638	0.7	3,959	0.7	1,946	0.8	1,584	0.6
Stillwater	3,195	0.5	3,952	0.7	575	0.2	1,929	0.8
Subtotal	38,257	5.6	33,975	5.7	14,121	5.5	15,019	5.9
Total In Selected Centers	213,699	31.6	198,690	33.4	83,639	32.8	86,850	34.0
Grand Total	677,206	100.0	593,992	100.0	254,902	100.0	255,261	100.0

* Calculation or tabulation problems.

Data Sources: U.S. Bureau of the Census (1994). 1990 Census Transportation Planning Package. Washington, D.C.: U.S. Government Printing Office; and Metropolitan Council (1992). Home Interview Survey, 1990 Travel Behavior Inventory. St. Paul, MN: Metropolitan Council.

Commuters from across the region journey to work at major job concentrations in the densely-urbanized area, including the twin downtown cores, the University of Minnesota, the international airport, and St. Paul's Midway district. The analysis also highlights marginal gender differences in the distribution of employment opportunities. For men, the share of workers journeying to destinations in the employment core ranges from four percent among residents of Carver County, to 23 percent for those living in St. Paul. For women, the comparable figures range from eight percent in outlying areas of Hennepin County, to more than 36 percent for residents of St. Paul.

The size and diversity of employment opportunities in the core attract both men and women from a wide variety of nearby urban neighborhoods and first-tier suburbs. Yet the commuting patterns of men and women diverge with increasing distance from the central cities, and women in outlying areas are much less likely to undertake the time and expense of journeying to downtown jobs. This finding is consistent with a number of studies investigating the manner in which traditional bid-rent curves vary for men and women.¹⁷

There are also sectoral variations in the relations between men's and women's commuting patterns. On the eastern side of the metropolitan area, the structure of local labor markets reflects the dominance of a small number of large employment centers in a diffuse mix of neighborhoods spanning a wide range of the class structure.¹⁸ Women in the dual-earner sample for Washington County typically work in downtown St. Paul and scattered service and retail jobs. Twelve percent of the women work in downtown St. Paul, compared with less than seven percent of men. With no long tradition of office work, both white- and blue-collar men in the Washington County sample are more likely to work in the manufacturing or distributive sectors, commuting to the suburban campus of 3M,

¹⁷Madden, J.F. (1981). "Why women work close to home." *Urban Studies* 18, 181-94.

¹⁸Washington County has long remained isolated from the upper-middle class residential expansion (and commercial, retail, and high-tech job growth) of the suburbs south and west of Minneapolis. Yet the area retains attractive natural amenities colonized by affluent residents (the unglaciated hills of Afton, evocative of the landscapes of the New England Anglophile elite) as well as tourist traps that have attracted younger homeowners since the late 1960s (Stillwater and townships along the St. Croix). By contrast, lower middle-class suburbs stretch through Oakdale, Lake Elmo, and along the rail and industrial strip through Newport and St. Paul Park. Rapid growth in recent years has gravitated toward Forest Lake, Cottage Grove, and Woodbury.

Andersen Windows' Bayport plant, and industrial centers scattered through east St. Paul, northeast Minneapolis, and northern Ramsey County (Figure 5.4).

On the opposite side of the metropolitan area, Bloomington and Richfield exemplify a dense and variegated housing market surrounded by a wide range of employment opportunities. Situated in the path of one of the region's most dynamic sectors of postwar residential growth, Bloomington and Richfield grew rapidly as commuter suburbs, subsequently attracting a sizeable base of commercial and industrial development in the 1970s and 1980s. Richfield developed primarily as a commuter suburb for lower-middle and middle class families in the early postwar period, and also includes a large number of affordable apartment units along its northern border. Bloomington, by contrast, benefitted from the higher level of investment ushered in by later phases of suburban growth. By the early 1970s, the expansion of the international airport and a new Interstate freeway network combined to attract a wave of dense commercial and retail development stretching a dozen miles across the city's northern tier.¹⁹ Growth continued through the 1970s and 1980s, as middle-class subdivisions and exclusive enclaves filled in the western half of the city.

The proximity of a large and diverse range of employment opportunities carves out distinctive commuting patterns for suburban residents on the south side of the metropolitan area. In purely spatial terms, residents of Bloomington and Richfield enjoy easy access to all types of employment--entry-level positions in retail and service centers in nearby commercial districts, administrative or clerical work in light manufacturing operations in east Bloomington, or high-paying professional positions in offices along Edina's freeway corridors. The result is a tightly integrated pattern of worktrips arrayed in a near-classic distance-decay pattern, with destinations for men and women in the dual-earner sample tracing virtually identical paths through the urban fabric (Figure 5.5). The vast majority of workers commute to commercial and retail agglomerations in Bloomington and Edina, and just under a tenth travel to downtown Minneapolis (Figure 5.5; Table 5.2). Yet while offices along the 494 corridor draw their white-collar workforces from the comparatively affluent suburbs nearby, the international airport draws most of its workers from across the Minnesota River, lending a distinctive pink-collar and

¹⁹Baerwald, T.J. (1978). "The emergence of a new 'downtown.'" *Geographical Review* 68(3), 308-18.

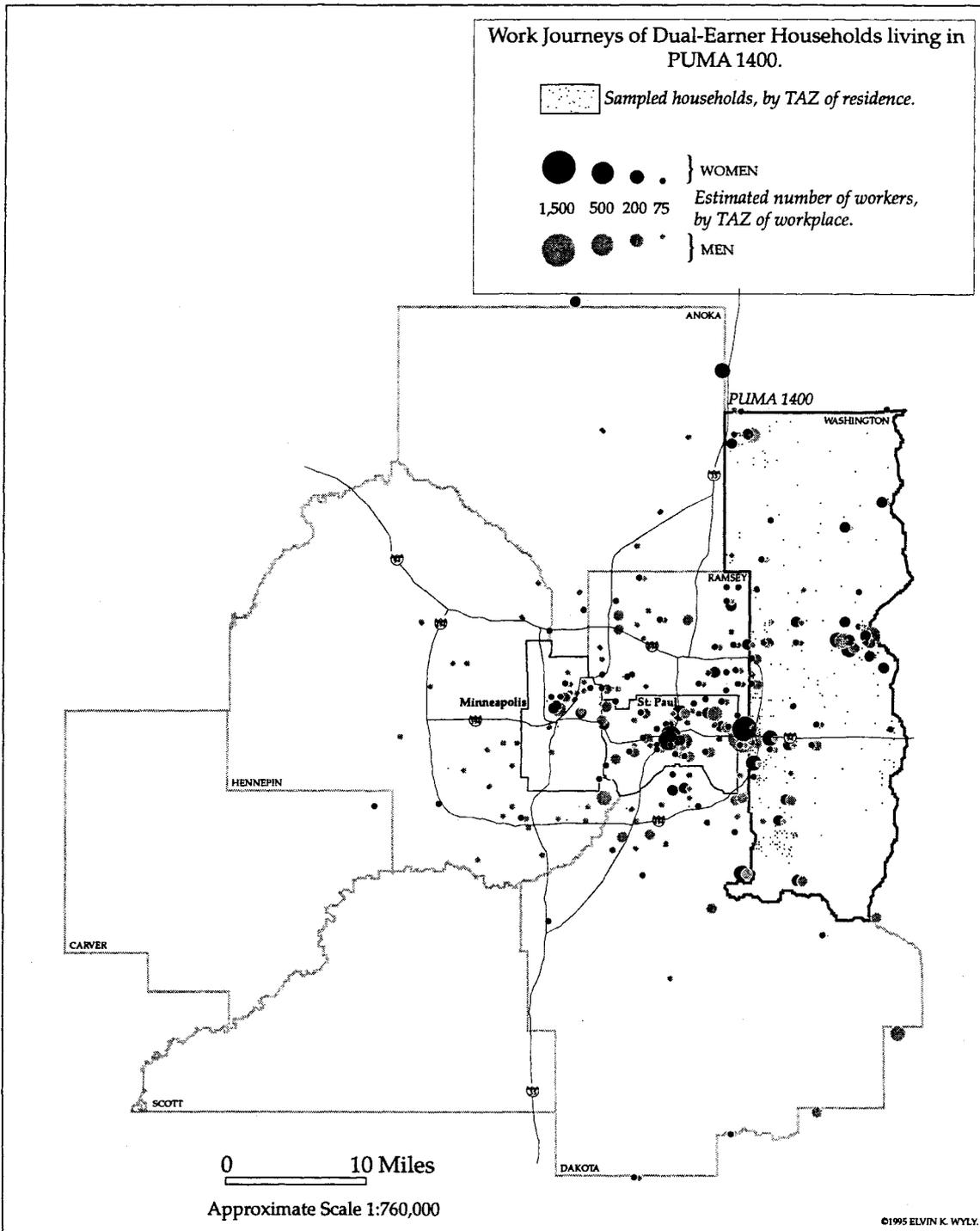


Figure 5.4. Workplaces of Dual-Earner TBI Households in PUMA 1400. Data Source: Metropolitan Council (1992). *Travel Behavior Inventory, Home Interview Survey*. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.

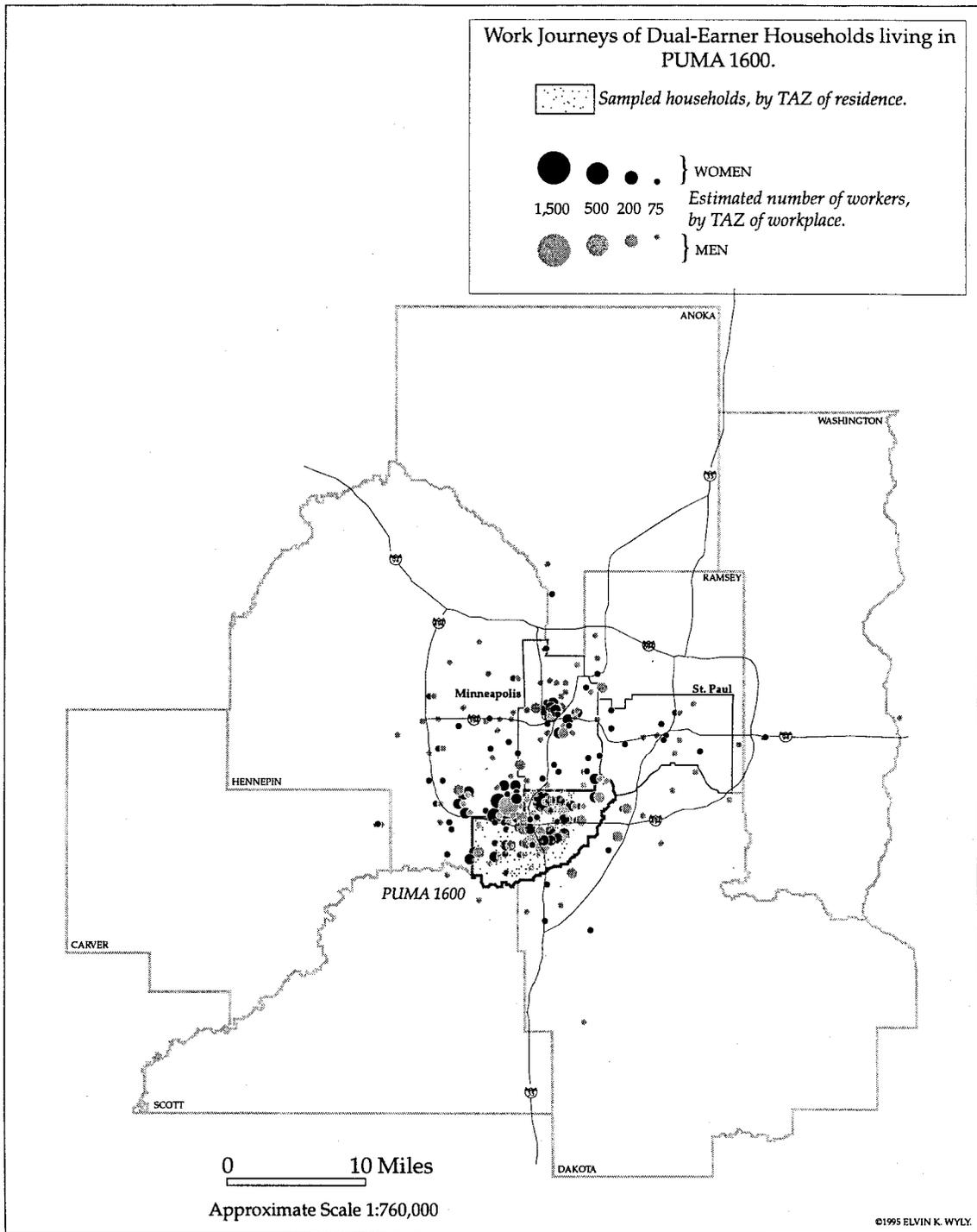


Figure 5.5. Workplaces of Dual-Earner TBI Households in PUMA 1600. Data Source: Metropolitan Council (1992), *Travel Behavior Inventory, Home Interview Survey*. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.

Table 5.2. Worktrip Destination by Place of Residence,
Dual-Earner TBI Sample.

PUMA of Residence	Place of Work					
	Minneapolis CBD		St. Paul CBD		Total, Core*	
	Men	Women	Men	Women	Men	Women
Carver County (1100)	2.2	3.9	0.6	0.0	4.1	8.5
Anoka (1200)	10.4	11.2	0.9	2.1	13.0	13.3
Northern Anoka County (1300)	4.1	7.1	2.2	1.8	11.9	11.7
Washington County (1400)	2.4	2.3	6.9	11.8	15.5	17.5
Minneapolis (1500)	10.7	18.7	1.8	1.4	21.7	35.3
Bloomington & Richfield (1600)	8.6	7.5	0.6	1.1	13.5	11.7
Plymouth (1700)	9.4	8.8	1.0	1.1	12.4	12.0
Brooklyn Center (1800)	4.9	12.0	1.4	0.0	12.2	14.8
Golden Valley (1900)	11.9	11.4	0.8	1.8	15.2	15.0
Western Hennepin County (2000)	7.5	4.3	0.5	0.0	10.0	8.2
St. Paul (2100)	6.5	4.6	6.7	16.4	23.2	36.3
Northern Ramsey County (2200)	4.2	6.9	6.1	5.6	20.0	20.6
Eagan & Apple Valley (2300)	5.5	5.0	5.1	2.8	19.5	16.2
Rest of Dakota County (2400)	3.5	1.8	3.8	7.3	12.5	19.1

Notes:

1. All figures are percentages.
2. *For areas included in employment core, see Figure 5.3 and Table 5.1.

Data Source: Metropolitan Council (1992). Home Interview Survey, 1990 Travel Behavior Inventory. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.

technical character to the dual-earner sample for Eagan, Apple Valley, and the remainder of Dakota County (Figure 5.6). Thanks in part to highway improvements and bridge construction, Dakota County's suburbs posted the metropolitan area's fastest rates of population growth over the 1980s.

The analysis of commuting patterns for dual-earner households underscores the theoretically obvious (but often ignored) fact that the interdependencies between home and work carve out labor markets at a fine spatial scale within the metropolis. Moreover, the discernable locational differences between men's and women's workplaces for some neighborhoods, as opposed to the lack of gender differences in commercial agglomerations in some mature, first-tier suburbs, suggests that the mix of nearby employment opportunities mediates the familiar gender gap in worktrip length.

Gender, Class, and Urban Social Space

Marxian as well as classical theories of residential differentiation posit clear spatial expressions of workplace-based class divisions in the labor force--such that residences for blue-collar and white-collar workers tend to cluster in certain, well-delineated neighborhoods. For two decades, feminist sociologists have explored the ways in which women's experiences of "social class" differ from those of men, and have challenged the use of conventional stratification theories to the contemporary, feminized labor force. In recent years feminist geographers have begun to tease out the implications of this critique for our understanding of the social geography of the North American city. The sheer magnitude of occupational sex segregation, for example, implies that women from a comparatively broad range of families work in low-status, low-paying clerical jobs, even though some of these women live in neighborhoods that might be described as upper-middle class on the basis of male residents' occupations. Because my primary interest is how the geography of women's employment varies within the metropolis, these arguments (described more fully in Chapter 2) provide an important theoretical basis for the empirical patterns I examine.

We can gain some insight into the spatial dimensions of workplace-based class divisions with a simple geographical analysis of selected segments of the regional workforce. I draw on the Census Transportation Planning Package (CTPP) to analyze the spatial distribution of jobs and residences for men and women in the

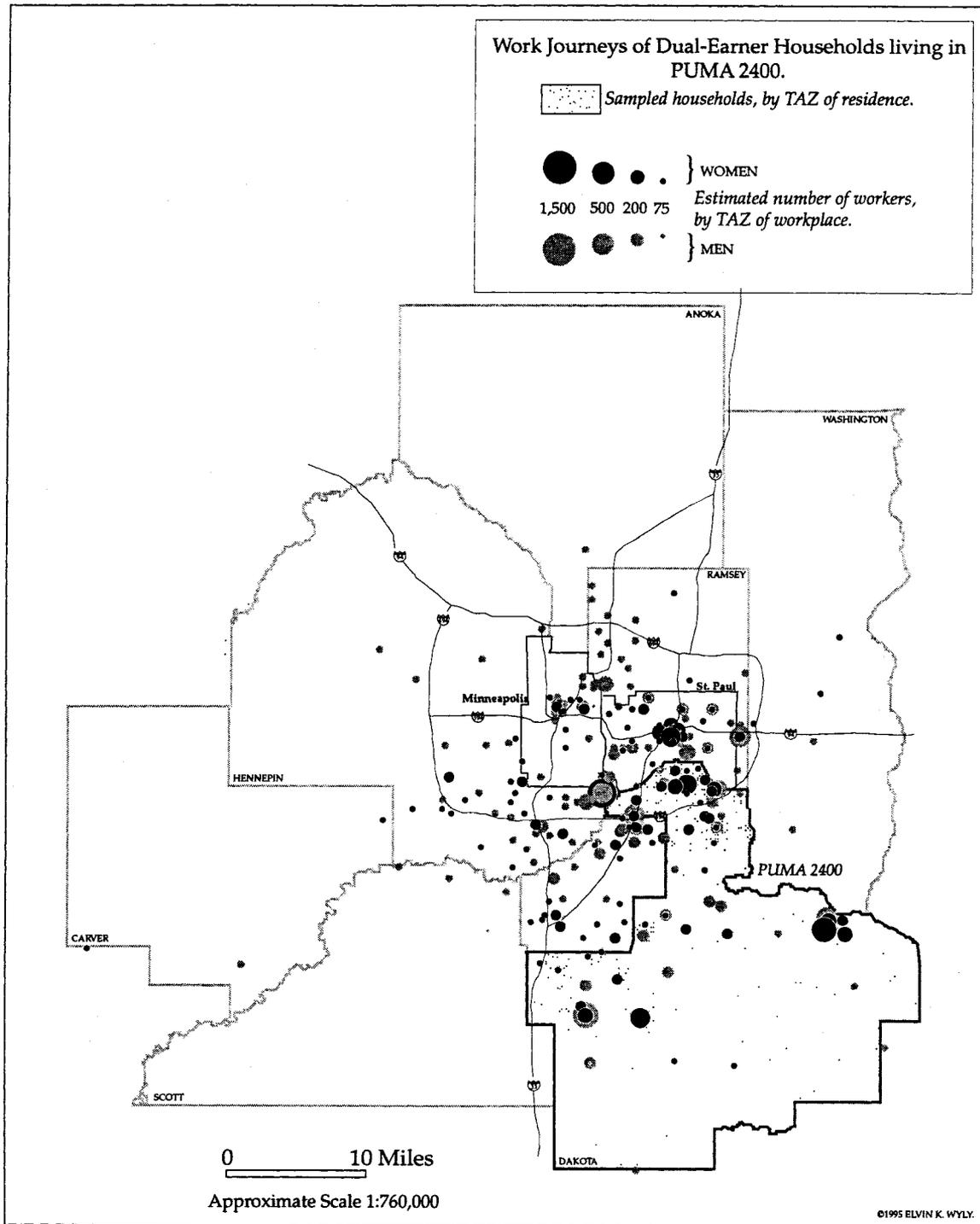


Figure 5.6. Workplaces of Dual-Earner TBI Households in PUMA 2400. Data Source: Metropolitan Council (1992), *Travel Behavior Inventory, Home Interview Survey*. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.

entire Twin Cities labor force, using the 1,165 traffic analysis zones of the study area as the spatial unit of aggregation (Figure 3.2). The CTPP provides breakdowns of employed workers both by place of residence and place of work, permitting detailed analysis of the spatial structure of local labor markets at a fine intraurban scale. It is important to recognize, however, that the place-of-work estimates are especially prone to sampling and non-sampling errors, as well as substantial geographically-biased estimates of multiple-location and "footloose" jobs. I therefore confine my exploration to a few selected segments of the workforce, and I focus on broad locational patterns rather than a rigorous quantitative spatial analysis. First, we examine the aggregate distribution of men's and women's local labor markets; we then compare one male-dominated sector (manufacturing) to a female-dominated occupation (administrative support); finally, we turn to gender differences in several parts of the service sector.

Gender-based labor-market segmentation is most clearly visible at the workplace, with slightly fewer than half of workers employed in zones with more than 55 percent of the employees of the same sex (Figure 5.7; Figure 5.8). While this result signifies only a modest departure--corresponding to a 55/45 split in the employment in a particular location--the locational configuration of gender-specific labor markets illuminates fine-grained textures in the underlying employment landscape.

For men, the distribution of workplaces suggests an intriguing relation between segmentation and spatial divisions among labor markets. For the male workforce as a whole, segmentation is only marginal, with male workers represented in occupations and industries in proportion to the distribution of total employment (See Table 4.2, Chapter 4). Yet a surprising number of men work in male-dominated local labor markets. Half of all men work in zones in which men hold more than 55 percent of total employment, and one-eighth work in zones over two-thirds male. The distribution of these zones reflects the locational calculus of industrial landuses, manufacturing operations, and wholesale and office employment in suburban business centers. Male-dominated zones cluster heavily in northeast Minneapolis, stretching along rail and industrial corridors toward northern Ramsey County and Anoka, through St. Paul's east side to the corporate campus and research laboratories of Minnesota Mining and Manufacturing (3M), and along the Interstate freeways south and west of Minneapolis (Figure 5.7).

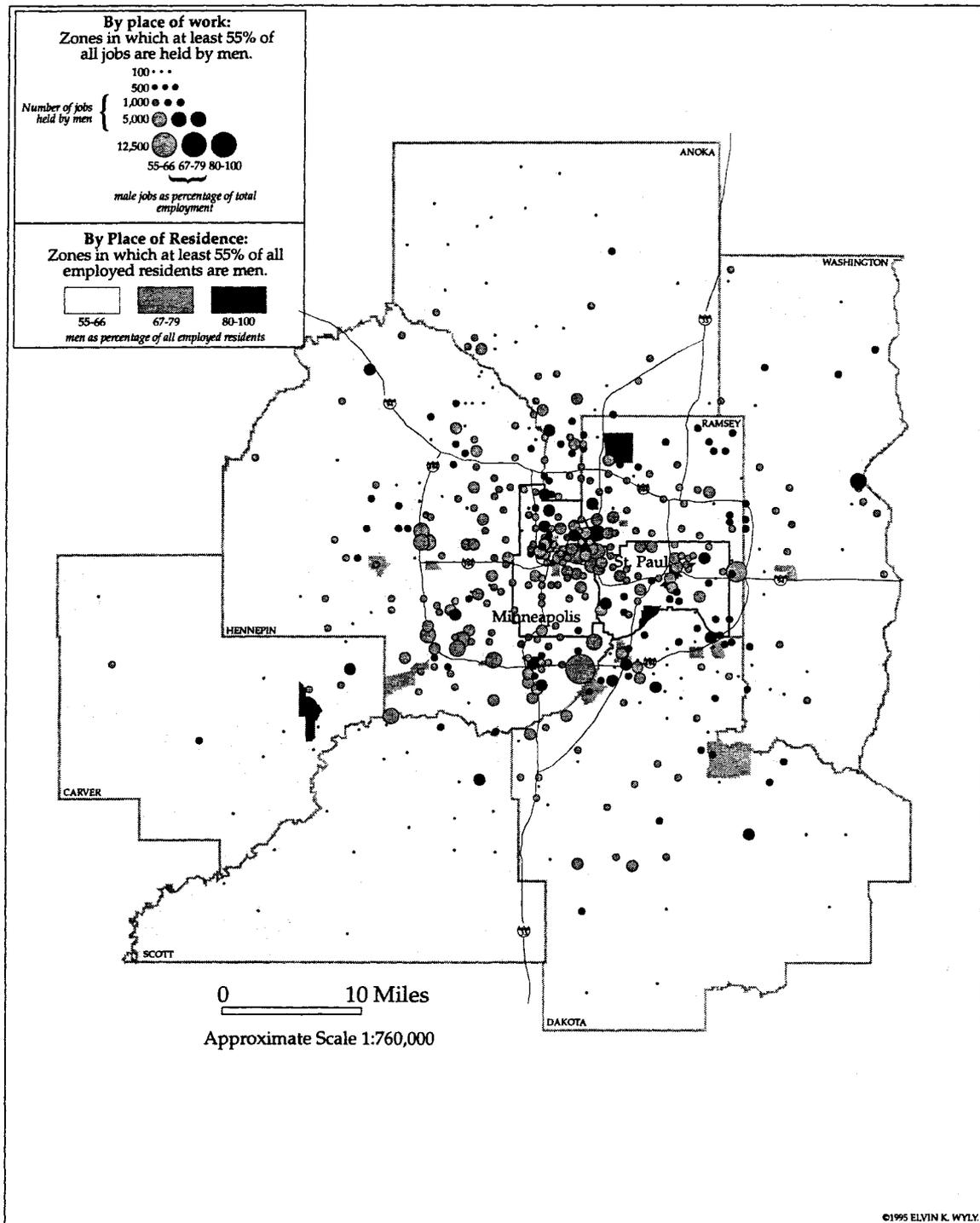


Figure 5.7. Male-Dominated Labor Markets. Data Source: U.S. Bureau of the Census (1994), *Census Transportation Planning Package, 1990 Census of Population and Housing*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

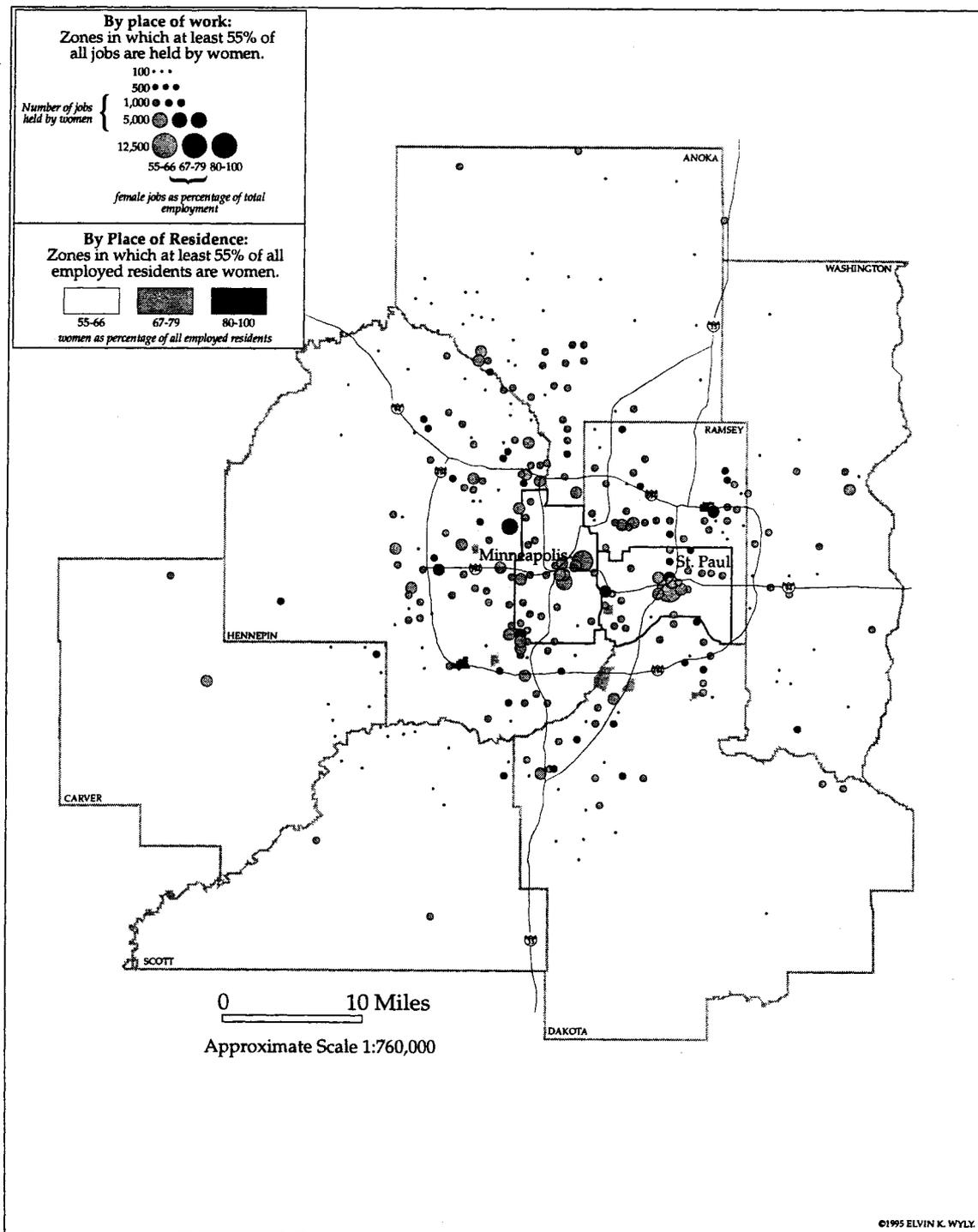


Figure 5.8. Female-Dominated Labor Markets. Data Source: U.S. Bureau of the Census (1994), *Census Transportation Planning Package, 1990 Census of Population and Housing*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

In contrast to the centralized pattern of male-dominated labor markets, the distribution of women's employment reflects the combined effects of occupational sex segregation and the locational requirements of service industries. Female employment is comparatively dispersed across the metropolitan settlement fabric, and only one-quarter of women work in zones in which women hold more than 55 percent of total employment. Fewer than four percent work in zones over two-thirds female. Yet the distribution of female-dominated labor markets provides compelling evidence of spatial outcomes of the well-documented processes of labor-market segmentation. On the one hand, concentrated demand for clerical and service workers carves out large, female-dominated employment centers inside the central cities, in accordance with the labor needs of the public sector and the secondary and temporary labor requirements of private firms. The highest demands for female labor appear in the central nodes of the urban core: downtown St. Paul, the state government complex on the north fringe of St. Paul's CBD, the Minneapolis campus of the University of Minnesota, and the regional hospital and health care complexes southeast of downtown Minneapolis (Figure 5.8).

On the other hand, the locational pattern of female workplaces in the suburbs reflects the historic segregation of women into "serving" jobs in industries that require access to a dispersed consumer market. Without exception, female-dominated employment centers in the suburbs mirror the distribution of retail and service functions and the siting of public services and institutions. Regional health care complexes demand the largest concentrations of female workers, with clusters of more than 2,000 women working in facilities in Anoka (Mercy Hospital), Edina (Fairview Southdale), and, most notably, North Memorial Medical Center in Robbinsdale. Nearly 3,000 women work in this latter zone, which also encompasses a string of commercial and retail outlets. Women comprise nearly three quarters of the zone's total employment (Figure 5.8).

Several additional concentrations of female employment point to women's segmentation in the retail sector, with female-dominated zones each encompassing between 1,500 and 2,500 jobs in major regional shopping centers in Brooklyn Center (Brookdale), Edina (Southdale), Roseville (Rosedale), and Maplewood (Maplewood Mall). A few female-dominated zones encompass major hotel concentrations along prominent highway corridors. Finally, several dozen employment zones, each with 250 to 500 female jobs, reflect women's segmentation into clerical work in a variety

of scattered suburban firms, as well as primary and secondary education and lower-order services dispersed across the metropolitan area (Figure 5.8).

To obtain a surrogate indicator of the spatial structure of local labor markets for different categories of employment, I extract gender-specific occupational and industrial tabulations from the CTPP database. The package includes separate breakdowns for men and women in each of 14 occupational groups and 18 industrial sectors, thus permitting a relatively clear focus on male- and female-dominated job categories. Men dominate in skilled and unskilled manual occupations, and to a lesser extent technical and sales work, and they comprise the majority of the workforce in construction, transportation, and manufacturing (Table 5.3). Women comprise 47 percent of the entire regional workforce, but account for more than three quarters of total employment in clerical and support occupations and the health care industry (Table 5.3). Similarly, women make up more than three-fifths of the labor force in professional services, education, and finance, insurance, and real estate. Enduring stereotypes and constraints also prevail in job categories comprising smaller segments of the regional workforce: men comprise 85 percent of workers in police, security, and other protective service occupations; 95 percent of the region's 3,000 private household workers are women, most of them African-American women (Table 5.3; Table 4.2).

To assess the spatial dispersion of different segments of the workforce, I tabulate the share of each job category in the first decile of zones sorted in rank order.²⁰ This analysis reveals wide variations in the relative concentrations of different kinds of work. By place of work, the first decile of zones encompasses just under 45 percent of total regional employment (Table 5.4). By place of residence, the first decile accounts for slightly less than three-tenths of all employed workers, although in some smaller segments of the labor force this figure approaches three-quarters (Table 5.4; Table 5.5).

²⁰I sorted zones in order of total employment for each occupation and industrial category, and performed the same procedure for residential counts; consequently, the locational pattern of the "first decile" (116 zones) is unique for each employment/residence category. While the variable size of zones introduces some bias into this approach, TAZs are delineated in much the same manner as census tracts, with zone size proportional to settlement density. Census tracts are defined to include roughly equivalent numbers of households, but TAZ definitions depend on a combination of criteria measuring employment, population, and local highway networks. I have also examined cumulative plots for all 1,165 zones for several occupational groups and industrial sectors, and am convinced that the first-decile figure provides a reasonable surrogate of labor-market dispersion for most job types.

Table 5.3. Gender Composition of Employment
by Occupation and Industry, 1990.*

	SIC	Total Employment	Percent Female
Occupation			
Executive, Administrative, and Managerial	000-042	181,661	41.8
Professional Specialty	043-202	191,390	51.7
Technicians	203-242	59,865	41.4
Sales	243-302	161,589	44.4
Administrative Support	303-402	234,209	77.3
Private Household	403-412	2,780	95.2
Protective Service	413-432	13,390	14.9
Other Service	433-472	135,337	62.0
Farming, Forestry, and Fishing	473-502	9,687	21.5
Precision Production, Craft, and Repair	503-702	119,503	9.9
Operators, Assemblers, and Inspectors	703-802	77,233	34.5
Transportation	803-863	41,096	8.0
Handlers and Laborers	864-902	39,214	19.6
Armed Forces	N/A	1,582	12.1
All Occupations		1,268,536	46.7
Industry			
Agriculture, Forestry, and Fisheries	000-039	11,720	30.3
Mining	040-059	835	19.4
Construction	060-099	60,612	11.0
Nondurable Goods Manufacturing	100-229	95,487	38.2
Durable Goods Manufacturing	230-399	156,385	29.5
Transportation	400-439	69,666	28.3
Communications and other Utilities	440-499	25,241	38.7
Wholesale Trade	500-579	71,023	32.5
Retail Trade	580-699	206,326	50.2
Finance, Insurance, and Real Estate	700-720	108,605	60.2
Business and Repair Services	721-760	70,990	39.7
Personal Services	761-799	32,022	67.8
Entertainment and Recreation Services	800-811	18,001	43.7
Health Services	812-840	104,917	77.6
Educational Services	842-860	92,529	63.4
Other Professional Services	861-899**	99,707	60.3
Public Administration	900-939	41,512	45.1
Armed Forces	940-960	1,582	12.1
All Industries		1,268,536	46.7

Notes:

*Includes nonresident workers.

**Includes SIC 841.

*Data Source: U.S. Bureau of the Census (1994). Census Transportation Planning Package, 1990 Census of Population and Housing. [Machine-readable file.]
Washington, D.C.: U.S. Government Printing Office.*

Table 5.4. Labor Market Centralization by Occupation.

Occupation	SIC	By Place of Work*				By Place of Residence**			
		Men		Women		Men		Women	
		Total Employment	First Decile	Total Employment	First Decile	Total Workers	First Decile	Total Workers	First Decile
Executive, Administrative, and Managerial	000-042	105,801	50.8	75,860	53.1	103,922	32.1	74,715	31.7
Professional Specialty	043-202	92,445	53.8	98,945	50.0	91,649	35.7	98,125	34.6
Technicians	203-242	35,070	65.1	24,795	62.7	33,072	35.6	23,909	36.2
Sales	243-302	89,860	44.1	71,729	49.5	87,649	32.2	70,432	31.0
Administrative Support	303-402	53,061	56.5	181,148	52.4	50,966	34.4	174,968	30.8
Private Household	403-412	133	100.0	2,647	59.7	132	100.0	2,590	61.7
Protective Service	413-432	11,394	65.0	1,996	83.7	10,949	41.1	1,931	68.7
Other Service	433-472	51,416	46.5	83,921	40.1	50,307	38.8	82,582	32.2
Farming, Forestry, and Fishing	473-502	7,602	56.8	2,085	68.9	7,568	51.0	2,066	68.8
Precision Production, Craft, and Repair	503-702	107,646	45.6	11,857	54.5	98,768	32.4	11,316	40.0
Operators, Assemblers, and Inspectors	703-802	50,563	55.9	26,670	59.0	45,349	37.3	24,811	39.4
Transportation	803-863	37,799	52.9	3,297	68.1	33,680	35.7	3,176	56.0
Handlers and Laborers	864-902	31,546	47.8	7,668	58.5	29,173	36.2	7,088	44.9
Armed Forces	N/A	1,390	99.9	192	100.0	1,606	80.6	200	100.0
All Occupations		675,726	45.5	592,810	45.8	644,790	28.5	577,909	29.3

Notes:

*Place of work tabulations include nonresident workers.

**Place of residence tabulations include workers employed outside study area.

Data Source: U.S. Bureau of the Census (1994). *Census Transportation Planning Package, 1990 Census of Population and Housing. [Machine-readable file.]*

Washington, D.C.: U.S. Government Printing Office.

Table 5.5. Labor Market Centralization by Industry.

Industry	SIC	By Place of Work*				By Place of Residence**			
		Men		Women		Men		Women	
		Total Employment	First Decile	Total Employment	First Decile	Total Workers	First Decile	Total Workers	First Decile
Agriculture, Forestry, and Fisheries	000-039	8,167	59.0	3,553	65.2	8,157	50.7	3,585	55.4
Mining	040-059	673	100.0	162	100.0	574	100.0	139	100.0
Construction	060-099	53,966	45.1	6,646	53.1	49,150	31.1	6,410	43.2
Nondurable Goods Manufacturing	100-229	59,026	65.4	36,461	66.6	56,156	32.8	34,889	34.8
Durable Goods Manufacturing	230-399	110,176	63.8	46,209	69.0	101,280	31.9	43,405	34.7
Transportation	400-439	49,973	71.3	19,693	76.1	45,317	36.3	19,219	38.8
Communications and other Utilities	440-499	15,476	71.1	9,765	79.7	14,962	36.8	9,576	43.1
Wholesale Trade	500-579	47,928	56.4	23,095	63.8	46,126	31.8	22,483	37.3
Retail Trade	580-699	102,769	44.5	103,557	49.3	99,755	31.6	101,513	30.7
Financial, Insurance, and Real Estate	700-720	43,263	65.3	65,342	68.6	42,326	35.5	62,724	33.1
Business and Repair Services	721-760	42,799	50.4	28,191	56.6	41,842	32.6	27,496	34.9
Personal Services	761-799	10,319	62.1	21,703	46.3	9,904	44.4	21,192	34.6
Entertainment and Recreation Services	800-811	10,127	56.4	7,874	59.3	10,101	42.1	7,866	43.9
Health Services	812-840	23,464	69.9	81,453	66.5	23,430	40.4	79,384	31.5
Educational Services	842-860	33,836	68.0	58,693	53.4	33,628	41.8	58,713	34.4
Other Professional Services	861-899***	39,569	55.8	60,138	45.3	38,756	37.7	60,015	33.2
Public Administration	900-939	22,805	72.0	18,707	76.6	21,720	36.9	18,424	41.4
Armed Forces	940-960	1,390	99.9	192	100.0	1,606	80.6	560	100.0
All Industries		675,726	45.5	592,810	45.8	644,790	28.5	577,593	29.3

Notes:

*Place of work tabulations include nonresident workers.

**Place of residence tabulations include workers employed outside study area.

***Includes SIC 841: Museums and Art Galleries.

Data Source: U.S. Bureau of the Census (1994). *Census Transportation Planning Package, 1990 Census of Population and Housing.*
 [Machine-readable file.] Washington, D.C.: U.S. Government Printing Office.

Substantial gender differences appear in the relative concentration of different kinds of employment. Within each occupational category, the share of women's jobs in the first decile falls short of that of men's, excepting male-dominated work in protective services, farming, and blue-collar vocations (Table 5.4). Likewise, the first decile of residential zones houses smaller shares of employed women than men working in the same job type, except for traditionally "male" occupations. These patterns suggest underlying relations between metropolitan spatial structure and the conditions of women's employment, with work in traditionally "female" jobs correlating with more diffuse labor markets.

The relative concentration of men's and women's work diverges to an even greater degree across industrial sectors. Although the decile figures vary in tandem for both men and women--reflecting the locational requirements of service industries reliant on access to a dispersed consumer market, for example--the numbers *within* each sector indicate persistent gender differences. Disregarding sectors with relatively few workers (armed forces, mining, agriculture), the decile figures for women generally fall short of those for men in traditionally "female" sectors (health care and education) (Table 5.5). The opposite pattern prevails in male-dominated industries (manufacturing, wholesale trade, and utilities) where women's inroads into non-traditional work apparently require commutes to centralized workplaces in well-defined employment districts scattered across the metropolis (Table 5.5).

To explore the complex spatial dimensions of labor-market segmentation, I map the distribution of workplaces and residences for different segments of the workforce. In addition to mapping the absolute number of jobs in each zone of the study area, I use location quotients to quantify the locational concentration and dispersal of population and employment.²¹

²¹For each of the 1,165 zones in the study area, I calculate location quotients thus:

$$LQ_{ij} = \frac{E_{ij} / X_{ij}}{E_i / X}$$

Where E_{ij} depicts the total number of workers in occupation or industry i in zone j ; E_i represents total regional employment in occupation or industry i ; X_{ij} is the number of workers in all categories in zone j ; and X is total regional employment. The resulting LQ_{ij} provides a measure of the concentration of a particular segment of the workforce in zone j , compared with the total size of the labor force in this zone. Zones where employment in segment i is *over-represented* feature LQs over 1.00, while *under-representation* of segment i reduces LQs below 1.00. By place of residence, I use choropleth

Manufacturing

The locational requirements of goods-producing firms govern the geography of the most prominent male-dominated local labor markets in the metropolis. Manufacturing accounts for a fifth of regional employment, and men hold two-thirds of all jobs in this sector. Among durable-goods industries, jobs continue to follow the pre-war alignment of industrial and rail corridors north of Minneapolis, but since the late 1950s these jobs have also gravitated toward the ascendant light-industrial districts and high-tech office parks of the south and west suburbs (Figure 5.9).²²

Standardizing this pattern by the distribution of population and employment for the entire workforce yields a clear partitioning of the metropolis (Figure 5.10). Men's employment in durable-goods plants is proportionally over-represented in nearly a hundred workplace zones, which draw disproportionate shares of their labor force from residential neighborhoods in Anoka County and outlying areas of Hennepin County. The geography of the region's productive operations has historically been at the root of the distinctive class and cultural character of a string of dozens of blue-collar suburbs stretching along the Mississippi north of Minneapolis.

Men's employment in the nondurable-goods sector partitions the urban area in a distinct, but corresponding fashion (Figure 5.11). Men's employment in nondurable goods plants is over-represented in nearly a hundred workplace zones along a broad axis through northeast Minneapolis and east St. Paul, within well-defined suburban industrial districts, and along the river corridors south of St. Paul and the Minnesota. The suburban corporate campus and laboratories of 3M, along with its local suppliers and contractors, dominate the employment landscape east of St. Paul. The Maplewood complex draws more than 6,300 male workers from an expansive labor-shed on the eastern half of the metropolitan area, reinforcing the distinctive manufacturing base associated with residential neighborhoods throughout Washington County.

symbolization to display residential zones housing disproportionate shares of workers in respective segments i ($LQ_{ij} \geq 1.50$). By place of work, I use graduate circles to depict employment zones with disproportionate shares of jobs in respective segments i ($LQ_{ij} \geq 2.00$). I apply these procedures to Figures 5.10, 5.11, and 5.13 - 5.19.

²²See Prestwich, R. (1968). *The Manufacturing Industry of the Twin Cities: Changes in Locational Emphases, 1947-1967*. Unpublished M.A. Thesis. Minneapolis: University of Minnesota.

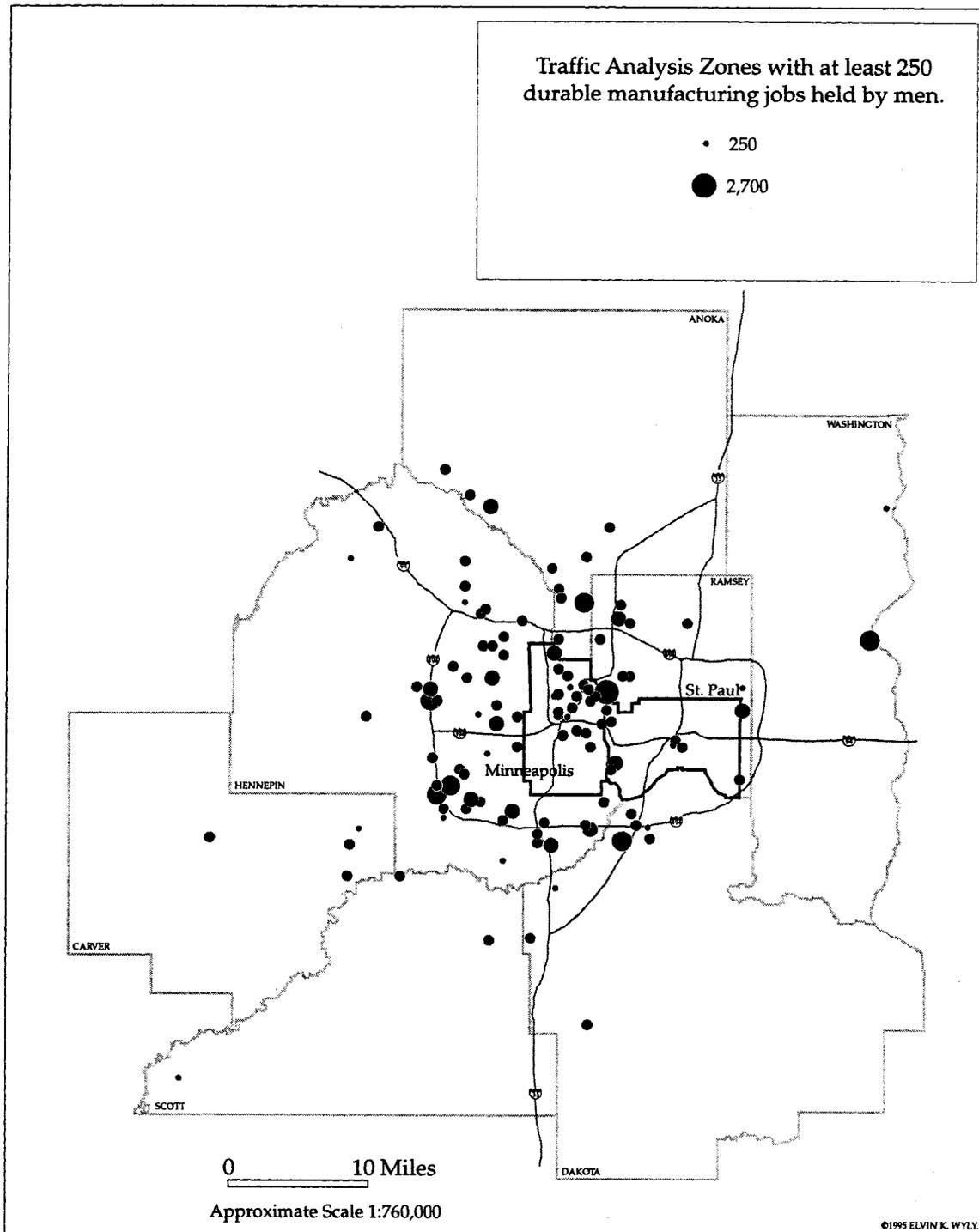


Figure 5.9. Major Job Concentrations for Males in Durable Goods Manufacturing. Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

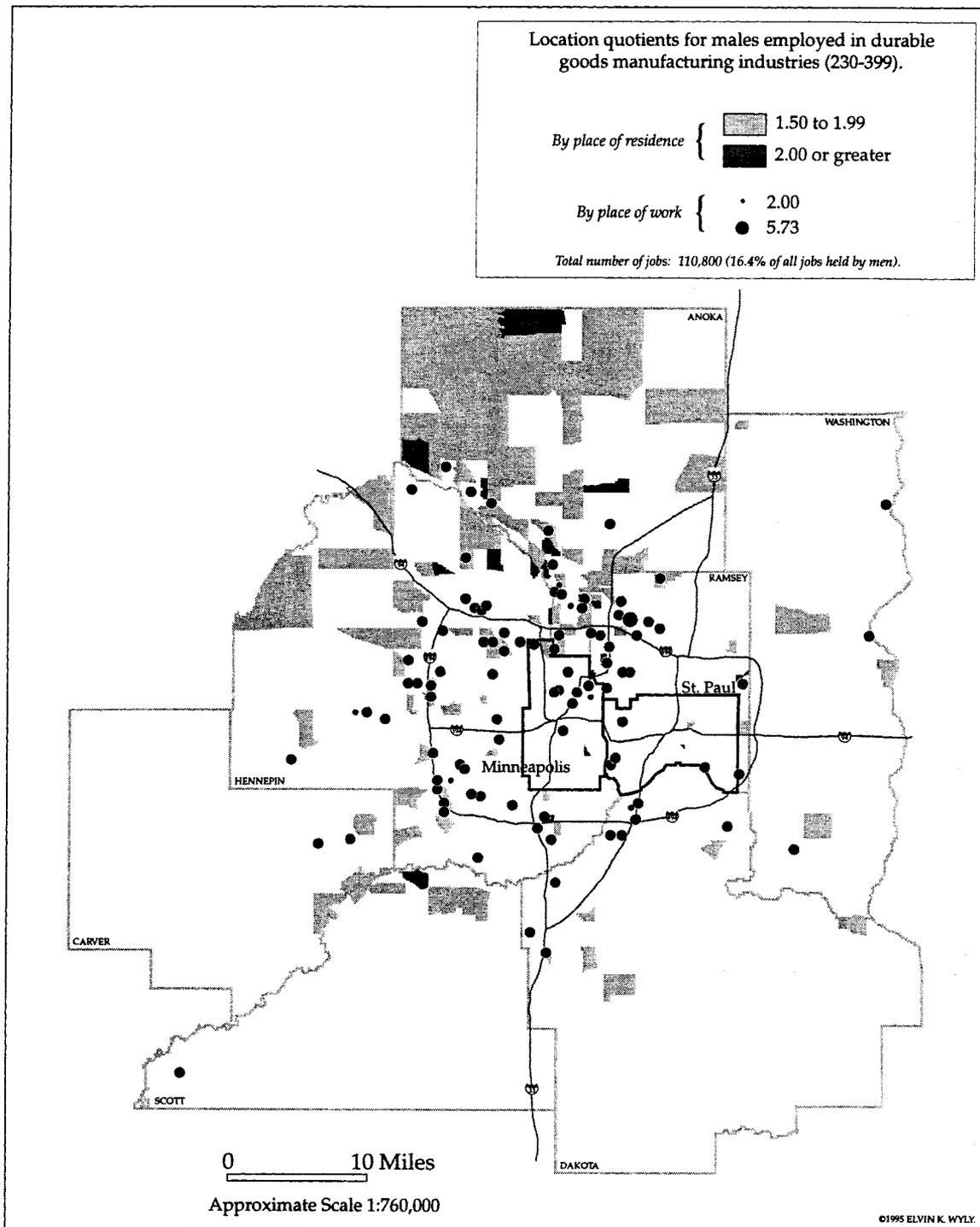


Figure 5.10. Location Quotients for Males in Durable Goods Manufacturing.
 Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package*.
 [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

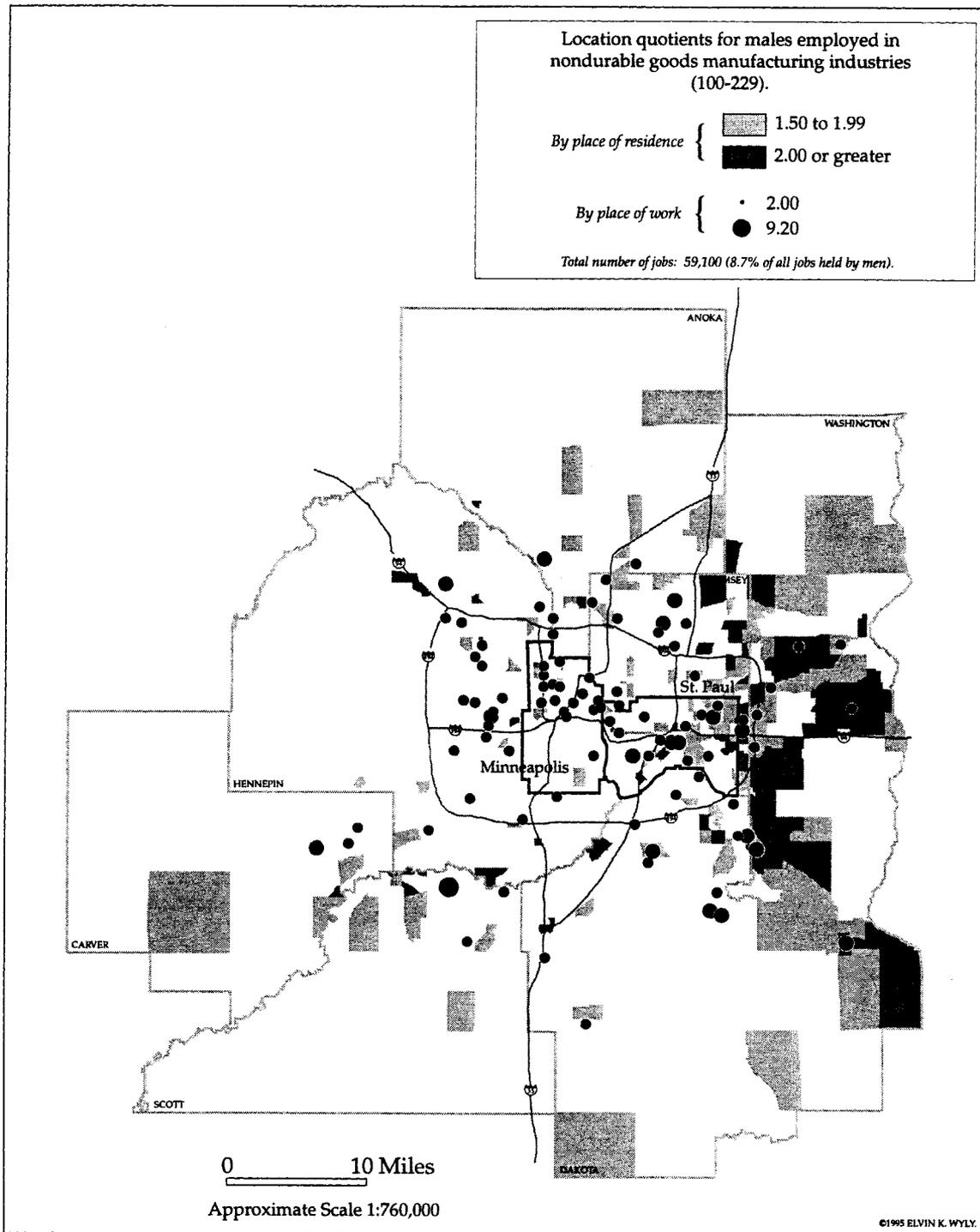


Figure 5.11. Location Quotients for Males in Nondurable Goods Manufacturing. Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

Administrative Support

In contrast to the clear geographical partitioning of male-dominated labor markets, the locational needs of service and support functions govern the spatial configuration of women's employment. In line with national trends, women hold more than three-quarters of jobs in administrative support occupations, which account for just under a fifth of regional employment. The distribution of these jobs mirrors that of total employment, with major nodes in the two downtowns and suburban commercial districts drawing typists, secretaries, clerks, and other support workers from nearby residential areas (Figure 5.12).

When standardized by the distribution of employment and housing for the entire workforce, however, labor markets for administrative support workers display no clear locational pattern (Figure 5.13). Only two workplace zones encompass disproportionate shares of female administrative support jobs. Only a handful of residential areas house disproportionate shares of female clerical workers, and these neighborhoods are scattered across the region in no discernable arrangement. Women employed in administrative support work comprise the same share of the total workforce--about 15 percent--in all workplaces and residential neighborhoods across the metropolis. At least in terms of occupational composition, women's employment differs little between downtown Minneapolis, suburban centers along the commercial strip west of the international airport, and back-office sites in lower-middle class areas in outlying areas of Hennepin and Anoka counties.

Health Services

The shapes inscribed by local labor markets for men and women also diverge within the same respective industries and occupational categories. A larger share of women (14 percent) than men (4 percent) hold jobs in health services; but the spatial dimensions of this industry indicate that the geography of male health workers conforms more closely to our conventional notions of urban socio-spatial structure.

For men, employment in health services traces out the loci of the Twin Cities' prominent medical research centers and hospital complexes (Figure 5.14). Workplace location quotients highlight the large agglomeration of hospitals and research centers southeast of downtown Minneapolis, the Minneapolis campus of the University of Minnesota, Ramsey Medical Center north of the St. Paul CBD, and

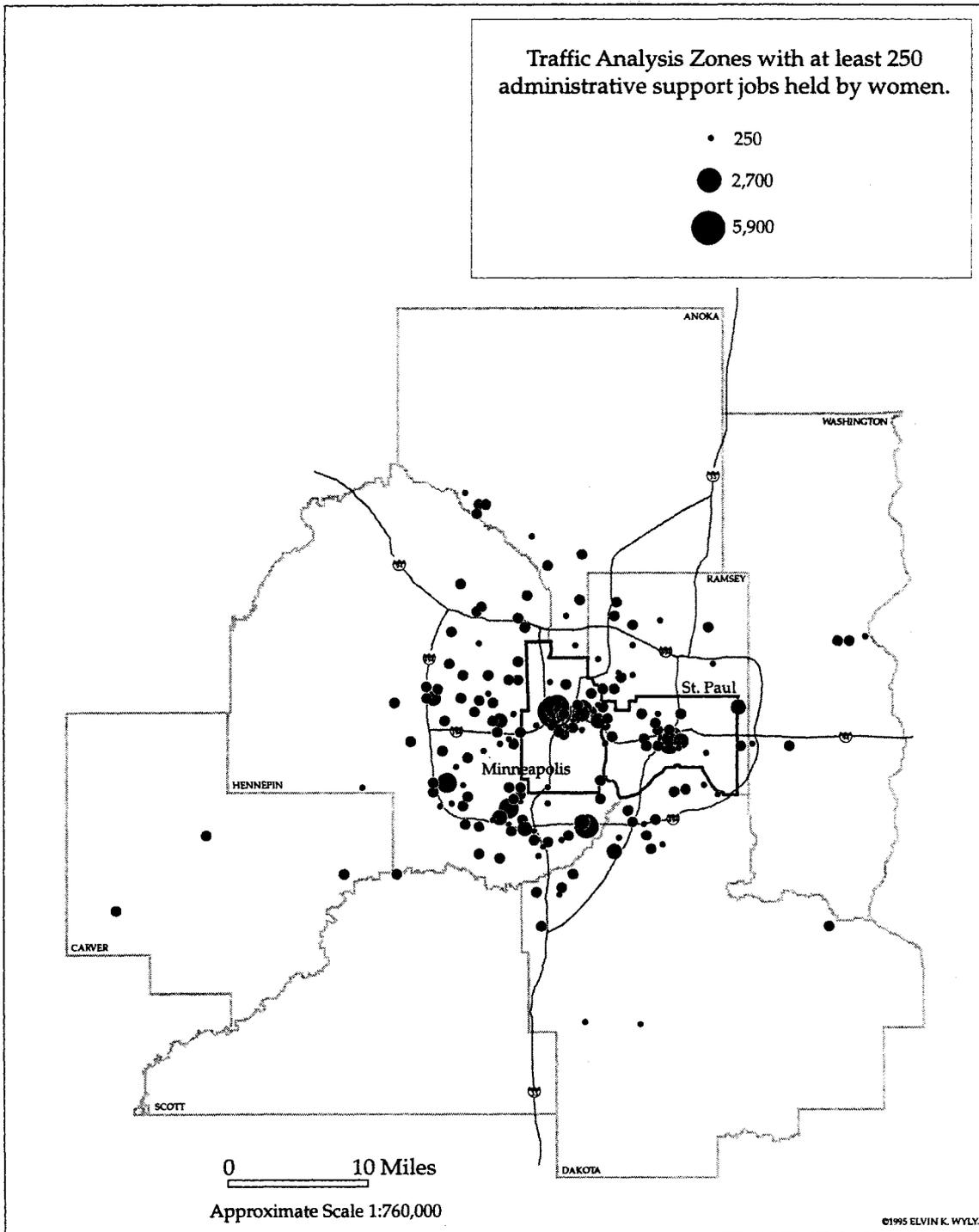


Figure 5.12. Major Job Concentrations for Females in Administrative Support Occupations. Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

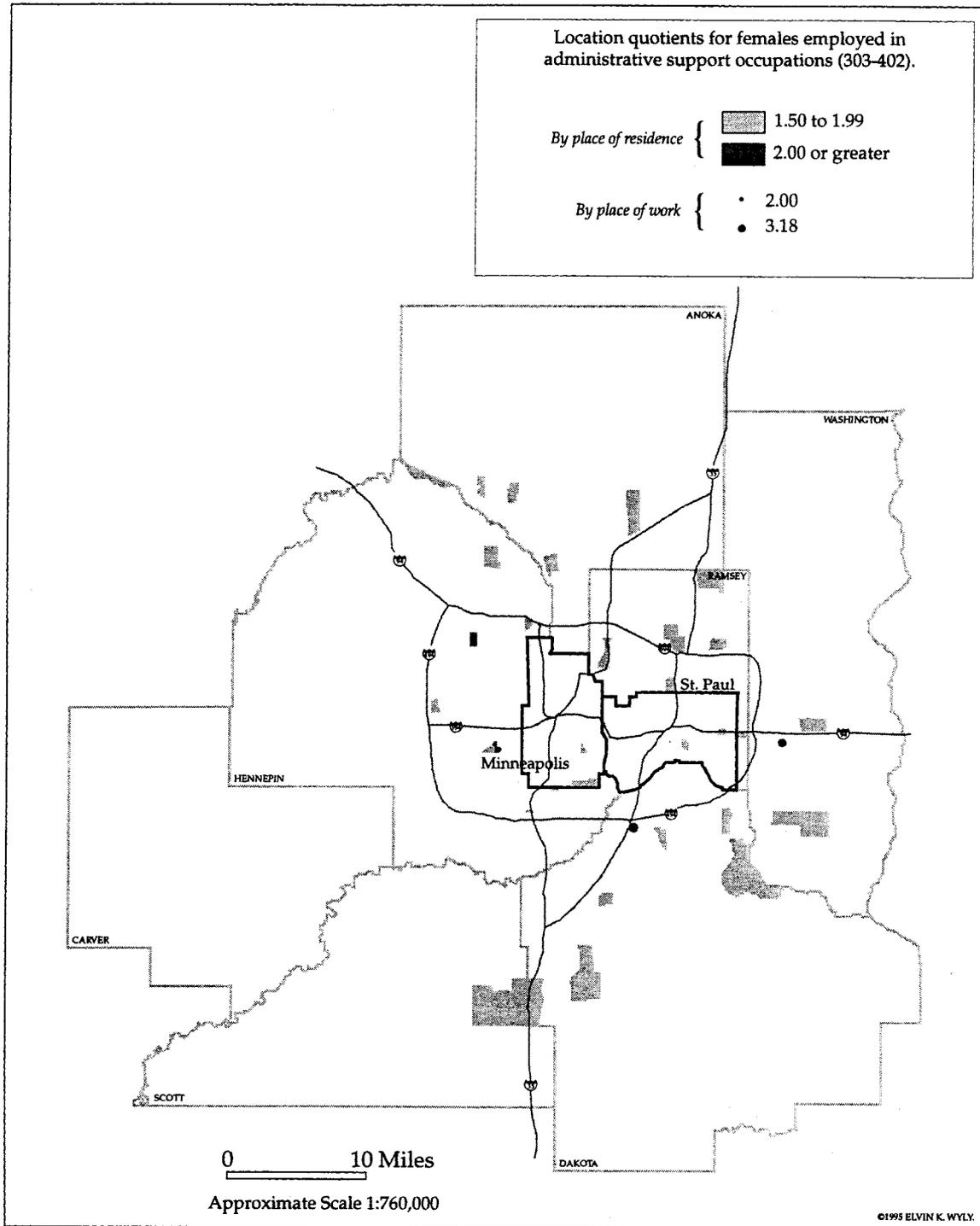


Figure 5.13. Location Quotients for Females in Administrative Support. Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

several suburban facilities. Mercy Hospital in Anoka yields the highest quotient (18.9), providing an extreme example in which a large share of the region's male health care workers are concentrated in an otherwise diffuse local context. By place of residence, men working in health services live disproportionately in the upscale neighborhoods surrounding amenity districts in Minneapolis and St. Paul, in the upper-middle class first-ring suburbs west of Minneapolis, and in scattered districts across the remainder of the study area. While some residence quotients highlight working-class districts in the inner city and outlying areas, the overall pattern gravitates toward the affluent sectors of the metropolis.

Women's employment in health services exhibits a geography in striking contrast to that of men in the same sector (Figure 5.15). While women work in the same facilities as men, the discrepancy between the sectoral and total job distributions is much less pronounced. Women's employment in this sector is comparatively less centralized, and female health care workers commute to a number of dispersed suburban sites in addition to the large regional research and hospital complexes. By place of residence, female health services workers live throughout all parts of the metropolitan area; with few exceptions, these women are not disproportionately concentrated in any one kind of neighborhood.

Doubtless these spatial disjunctures reflect the respective gender compositions of occupational categories within the health services sector, with men predominating among physicians and other professional positions and women holding most of the nursing jobs. Occupational segmentation by industry almost certainly explains most (if not all) of the geographic variation in this segment of the workforce, and highlights the limitation of the CTPP for local labor market studies.²³ This consideration notwithstanding, the basic feature of these spatial patterns supports my central argument. For men, the geographical configuration exhibited within conventional employment categories conforms reasonably well to our classical portrait of the social geography of the city. Yet the same taxonomy applied to the female labor force effectively suppresses any image of classically-defined urban social space.

²³The CTPP provides gender-specific summary tabulations by industry and occupation, but does not permit the analysis of occupational patterns *within* industrial groups. To do so, the only feasible option is to request special tabulations directly from the U.S. Bureau of the Census; at the time I undertook this study, the Bureau was not yet able to process customized tabulations for the 1990 enumeration.

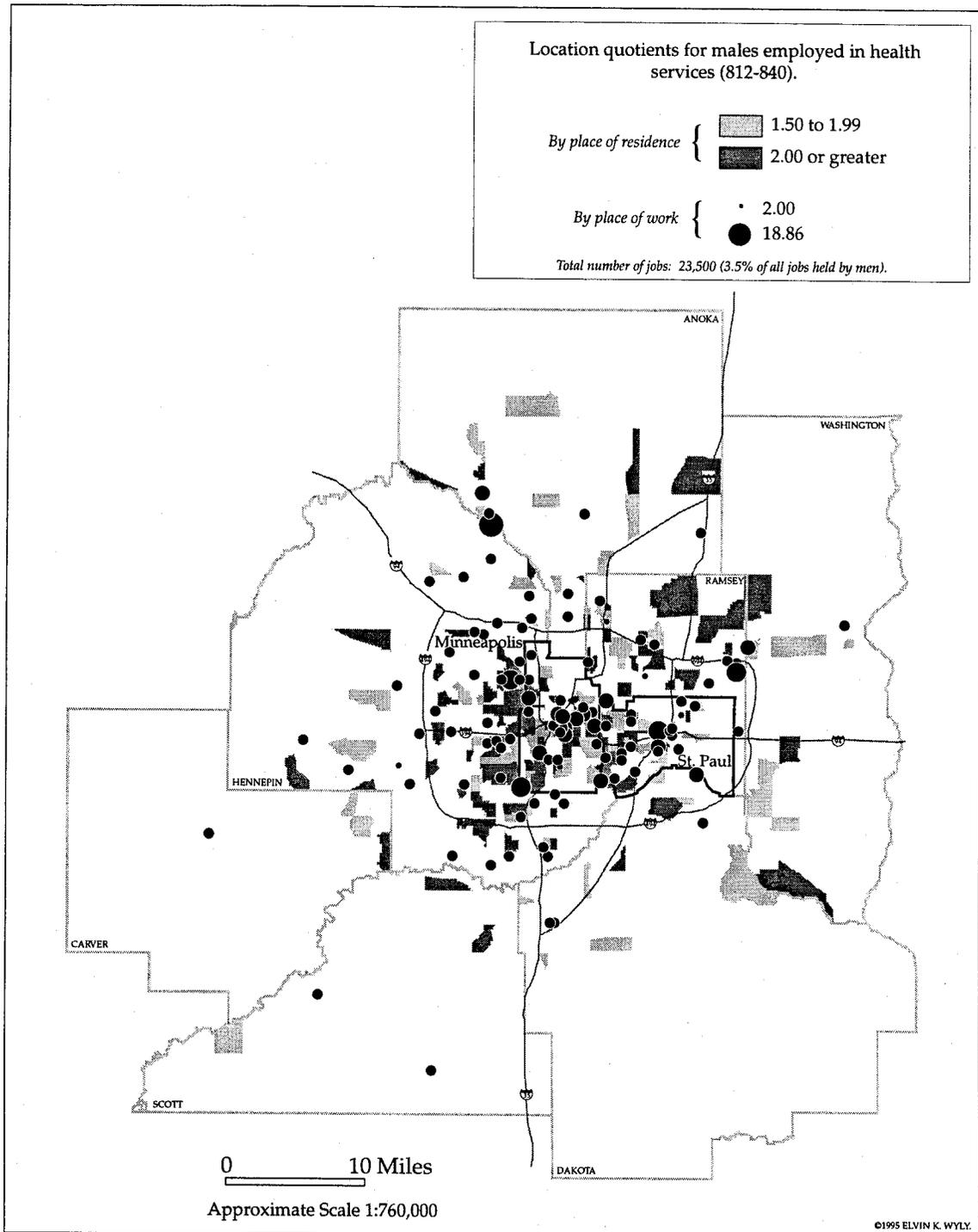


Figure 5.14. Location Quotients for Males in Health Services. Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

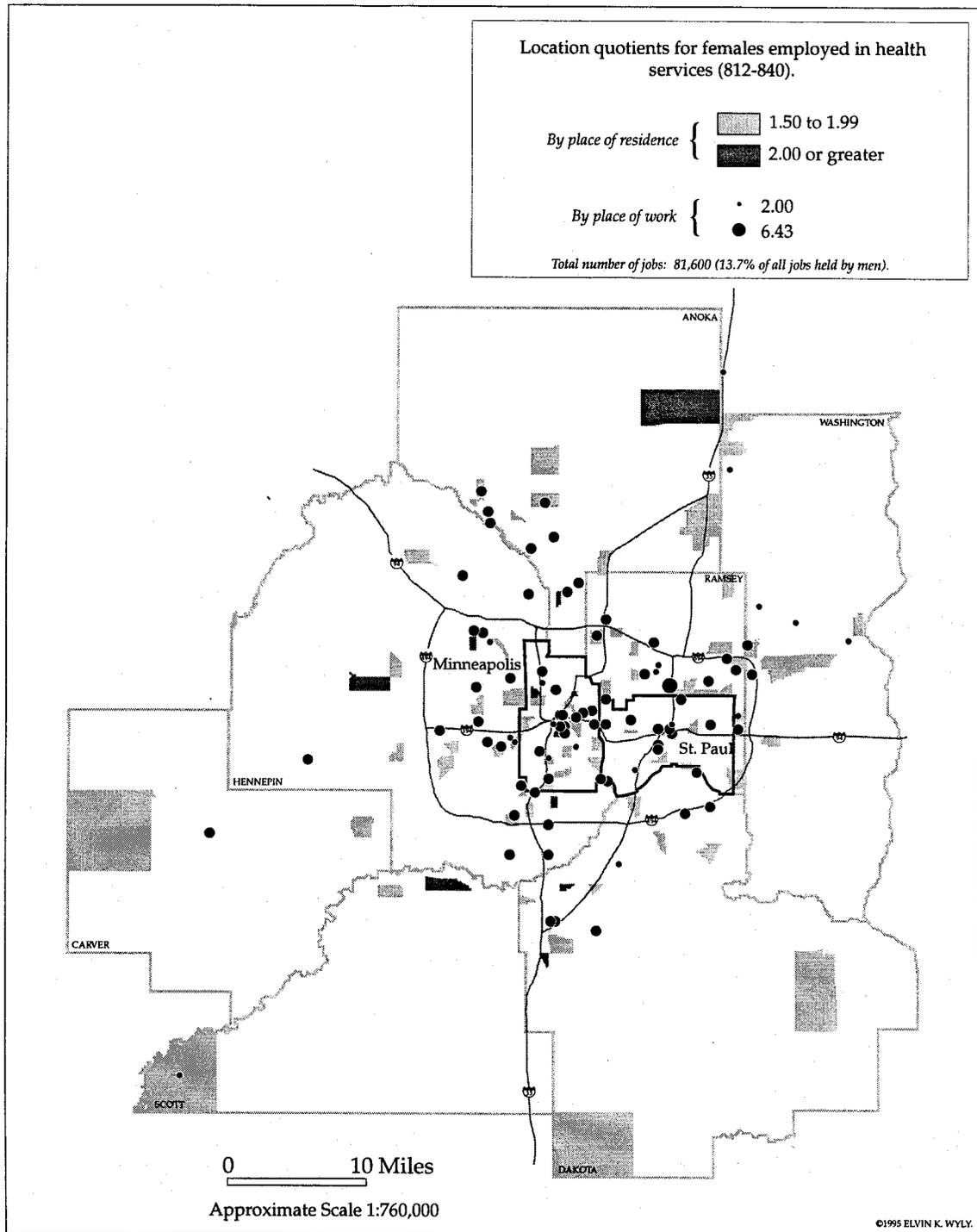


Figure 5.15. Location Quotients for Females in Health Services. Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

Service Occupations

Gender differences in service occupations further reinforce this interpretation. A larger share of women (14 percent) than men (8 percent) hold service jobs. This category includes a number of male-dominated categories such as janitors, barbers, and public transportation attendants, as well as historically "feminized" jobs such as waitresses, dental assistants, and other health aids. Interestingly, some job titles reveal the explicit role of gender in the occupational classification scheme, as in the case of separate categories for "barbers" and "hairdressers and cosmetologists."

The spatial labor markets of men and women service workers depart considerably from one another (Figure 5.16; Figure 5.17). For men, workplace location quotients cluster along the prominent retail and service corridors of the central cities and in major suburban centers. With the rapid suburban expansion of low-wage employment during the 1980s, the disproportionate concentration of service workers in inner-city neighborhoods has prompted considerable debate on the parameters of a growing "spatial mismatch" for poor residents of Minneapolis and St. Paul; this pattern seems to prevail among a sizeable share of male service workers (Figure 5.16).

For women, service employment is much more dispersed across the urban fabric (Figure 5.17). Workplace location quotients are dispersed widely across the entire urbanized area, and many of the highest quotients appear in second- and third-ring suburbs. Moreover, female service workers live throughout the metropolis, residing in peripheral suburban neighborhoods as well as in some of the inner-city districts of Minneapolis and St. Paul.

As with the health services sector, the geographical structure of service occupations indicates that the distribution of men's occupations conforms much more closely with classical theories of residential differentiation. Moreover, the dissonant patterns strongly suggest that this portion of the *occupational structure* groups together men and women from distinct segments of the *class structure* -- for example, poor and minority men living in inner-city districts, as contrasted with married women living in outlying suburban neighborhoods on the fringe of the metropolitan region.

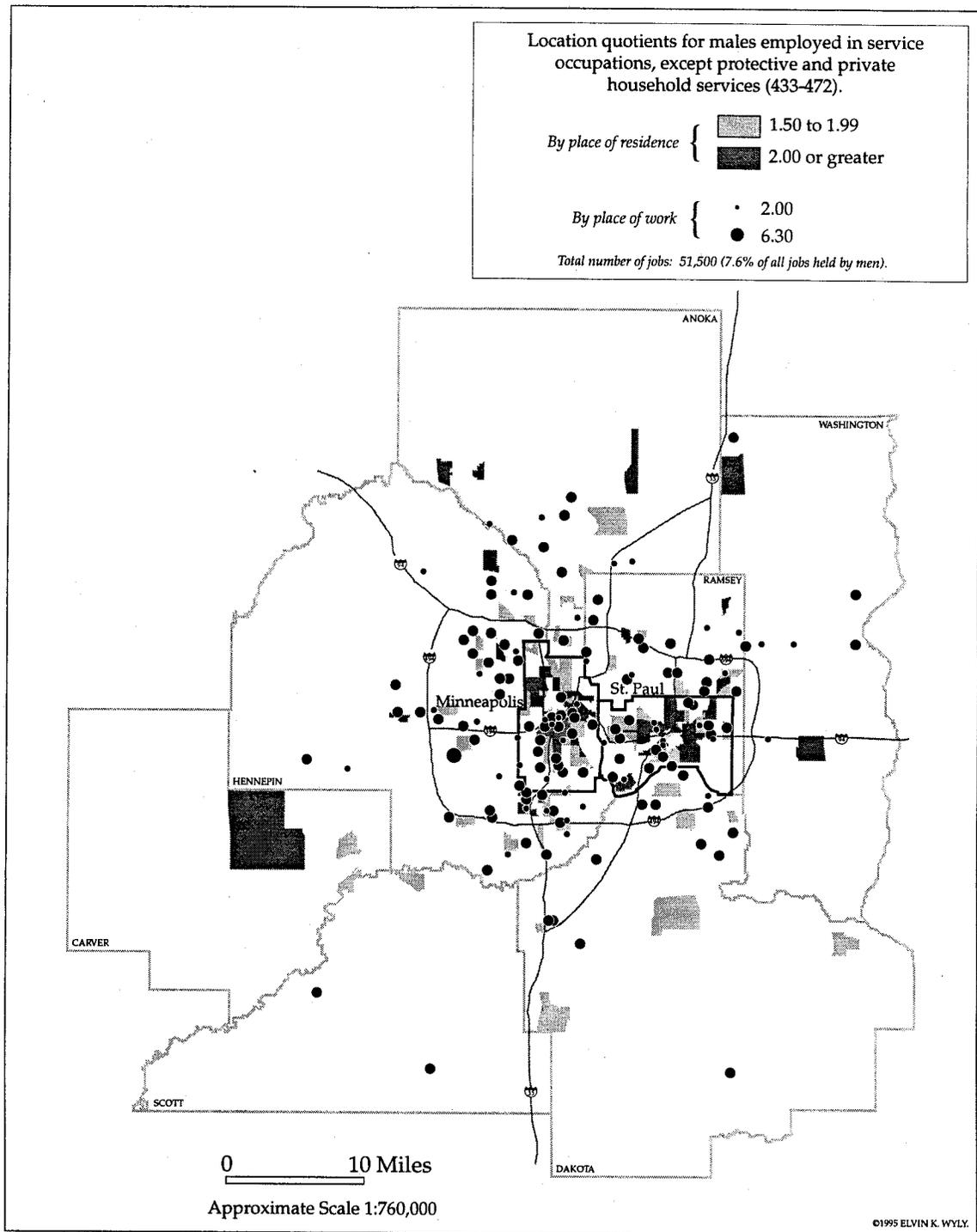


Figure 5.16. Location Quotients for Males in Service Occupations. Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

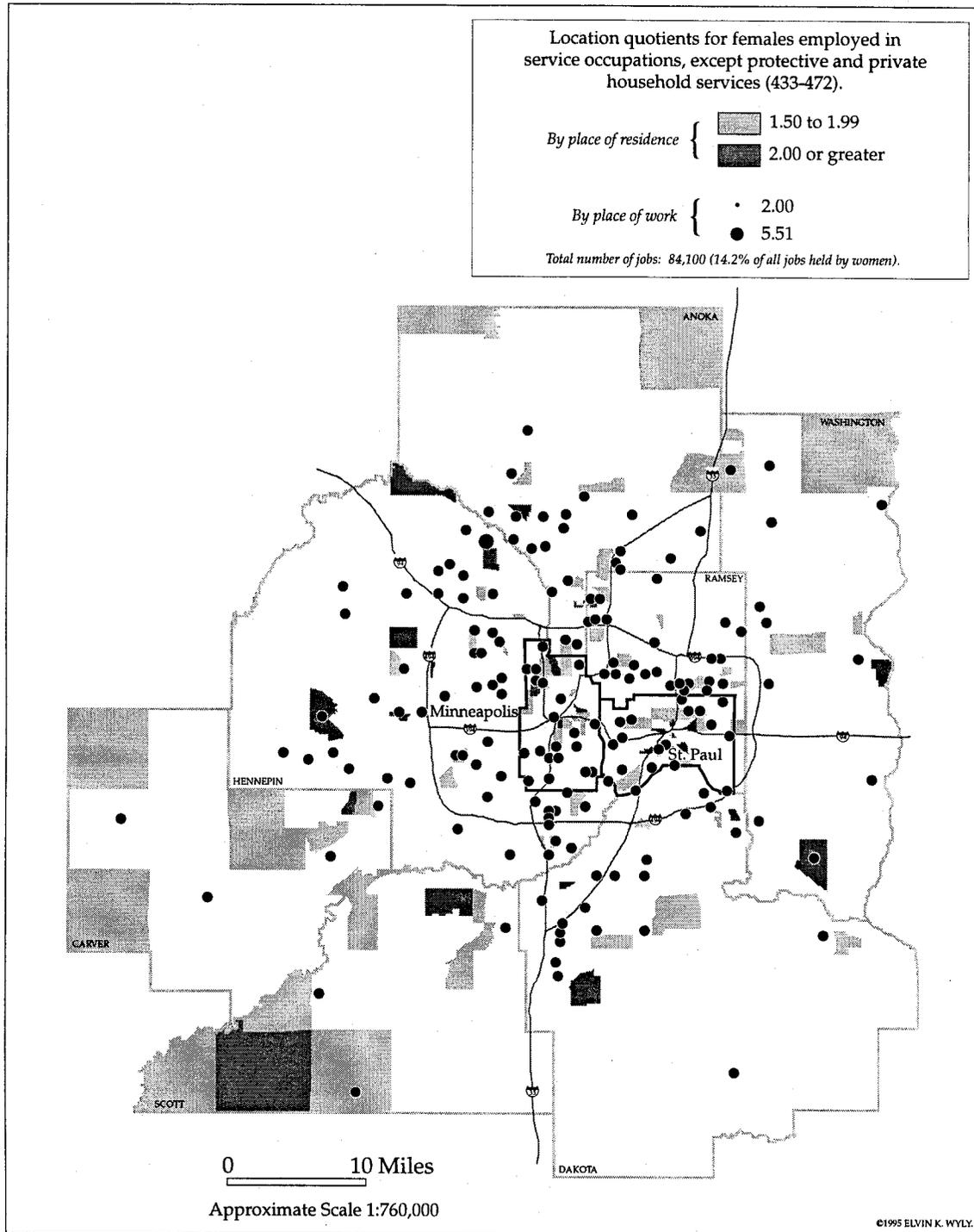


Figure 5.17. Location Quotients for Females in Service Occupations. Data Source: U.S. Bureau of the Census [1994]. *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S.G.P.O.

Finance, Insurance, and Real Estate (FIRE)

I return to an industrial sector to examine a final set of empirical evidence on the role of gender in mediating the geographical structure of local labor markets. A greater share of women (11 percent) than men (6 percent) hold jobs in finance, insurance, and real estate. But the fine-grained locational patterns traced out by men's jobs accentuate what is to all local observers a familiar feature of the Twin Cities region: the buoyant regional finance and service economy rooted along the commercial corridors and residential neighborhoods extending south and west out of Minneapolis toward Lake Minnetonka (Figure 5.18). For women, the pattern is much less pronounced, and the "fertile crescent" of the south and west suburbs dissolves into a comparatively diffuse network of local labor markets (Figure 5.19). While women work in the same financial centers as their male counterparts, they tend to come from a broader range of residential suburbs throughout the suburbs. It is highly likely, moreover, that detailed occupation-by-industry tabulations would further accentuate these contrasts, for example showing a perfectly flat "topography" of labor supply among female clerical workers in the financial sector.

Differences in the location of men's and women's employment point to complex relations between processes of labor-market segmentation and the social geography of the city. In addition to illuminating the richly-textured spatial scale of labor markets in the metropolis, this simple analysis provides strong empirical support for recent feminist arguments regarding the role of gender in theories of residential differentiation. In the main, conventional stratification theories embedded in the census occupational and industrial classification still provide an accurate portrait of urban social space in terms of the social class of male workers. Given the enduring fact of occupational sex segregation, however, the same categories conceal the differences in labor-market experiences of women in different parts of the city. I now turn to a brief analysis of one facet of women's work experiences: earnings opportunities.

Gender and the Intraurban Wage Gradient

The localized form of women's labor markets compared to men's also appears to exert marginal -- but significant -- effects on earnings opportunities. To examine the nature of these effects, I turn to the dual-earner PUMS database described in Chapter 3. I tabulate average annual income from all sources for husbands and wives in the sample, and perform multiple-comparison means tests

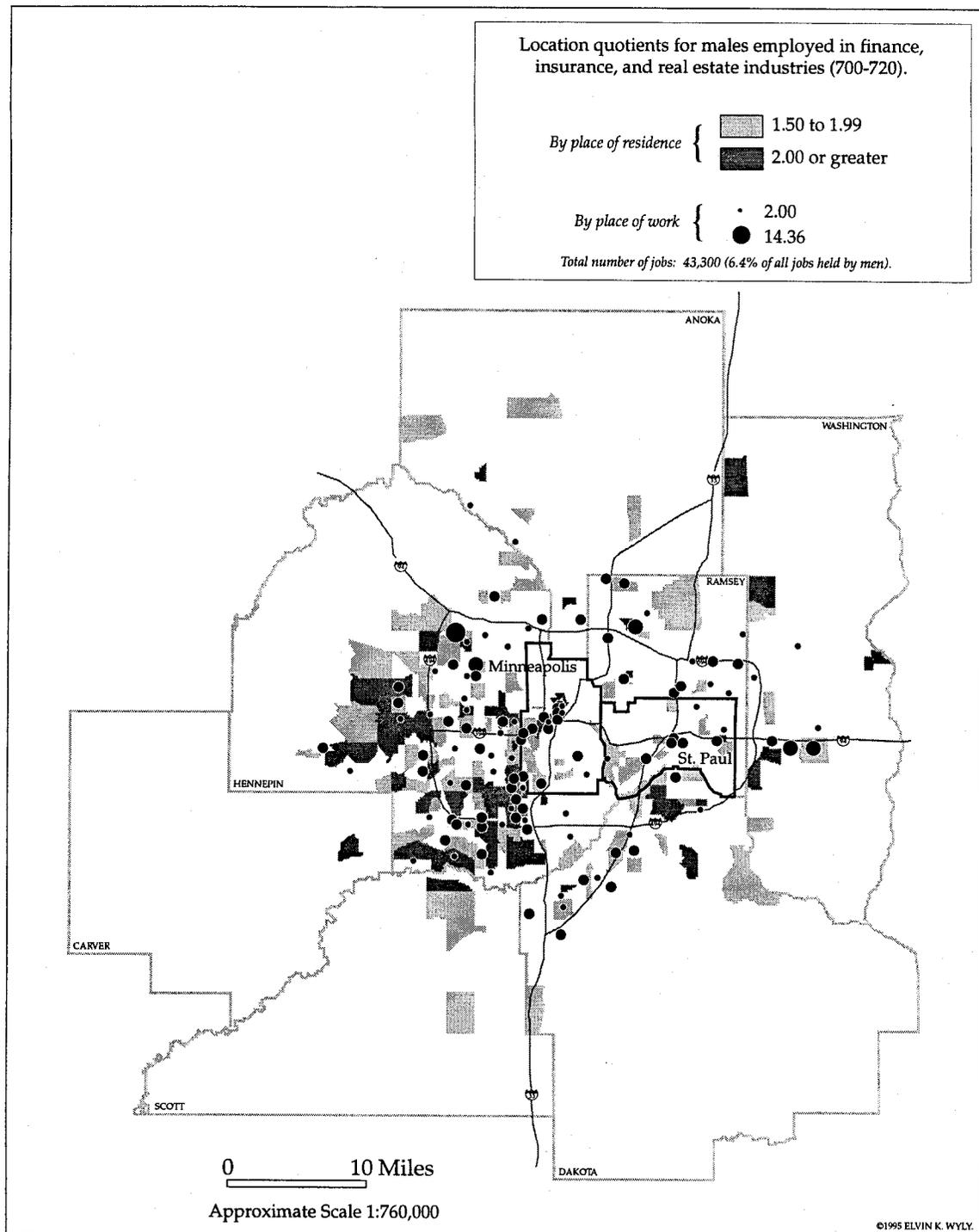


Figure 5.18. Location Quotients for Males in Finance, Insurance, and Real Estate. Data Source: U.S. Bureau of the Census (1994). *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

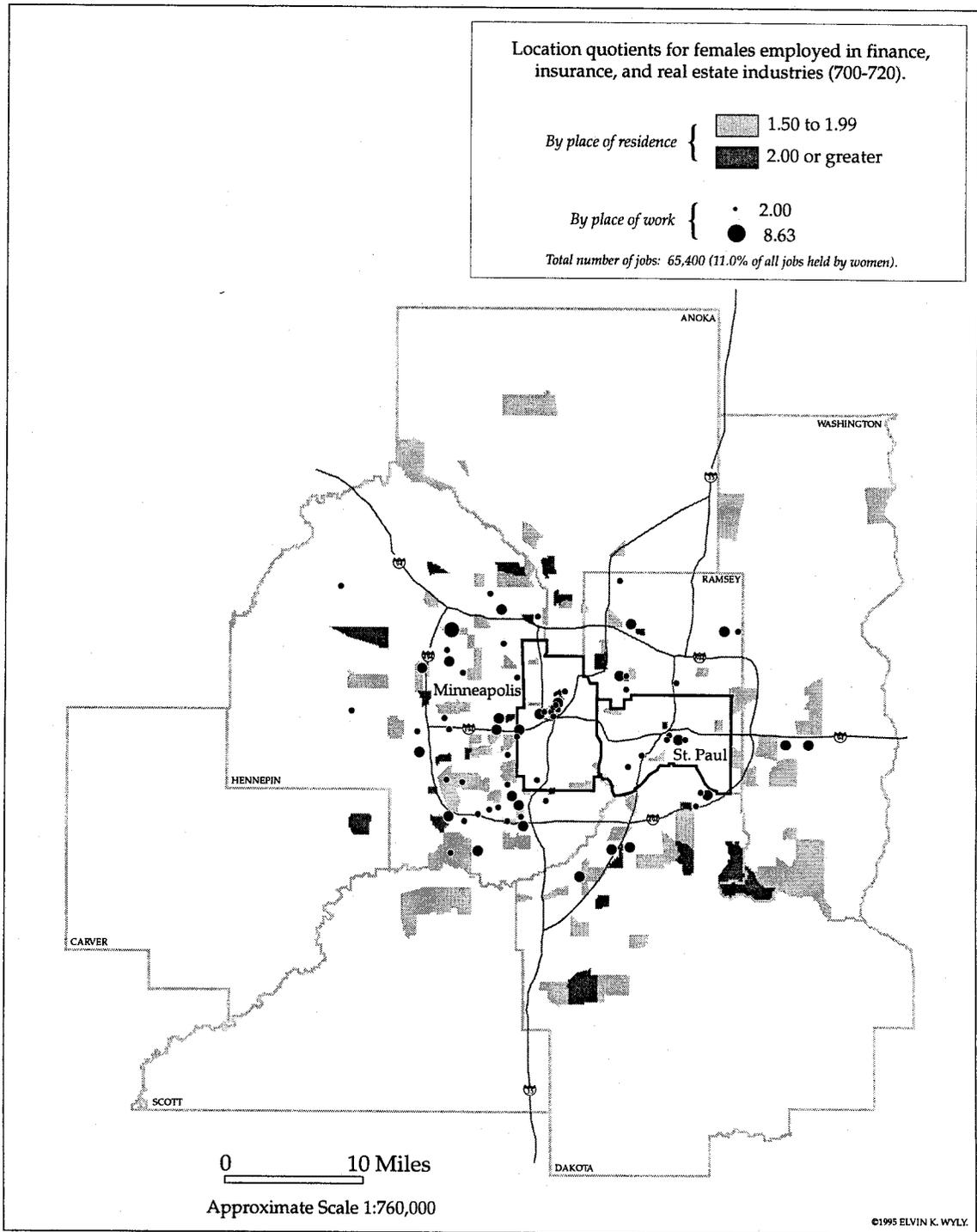


Figure 5.19. Location Quotients for Females in Finance, Insurance, and Real Estate. Data Source: U.S. Bureau of the Census (1994). *1990 Census Transportation Planning Package*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

to evaluate the significance of differences among Public-Use Microdata Areas (PUMAs).²⁴ The dual-earner PUMS sample includes just under 8,000 families, corresponding to an estimated 450,000 workers. I perform separate calculations for a subsample of "full-time dual-earner" households in which both spouses work at least 30 hours per week, reducing the sample size to just under 5,900 families representing 330,000 workers.

The dual-earner sample includes a large share of upper-middle class households. Workers in the sample garner an average of \$27,900 annually, compared to just under \$24,400 for the entire metropolitan area.²⁵ Yet the data confirm striking differences in earnings for husbands and wives. Wives' earnings fall short of those of husbands in all parts of the metropolitan area, owing to the combined effects of occupational segregation, women's interrupted work careers, and (probably) outright employer discrimination (Table 5.6). Across the region, wives' average annual earnings barely exceed half those of husbands; the gap narrows only slightly for full-time wives, whose earnings approach an average of sixty percent of husbands'. Interestingly, earnings for full-time employed husbands fall short of those in the entire sample, owing to the inclusion of non-salary income in the calculation of personal earnings.

The analysis also suggests marginal, though persistent gender differences in the geographical distribution of earnings opportunities (Table 5.6). For husbands, annual earnings vary widely across the metropolitan area, from a modest \$33,000 in the northern suburbs of Anoka County, to more than \$42,000 in outlying areas of Hennepin County. Yet these disparities fail to prove statistically significant, and earnings variations between different parts of the metropolitan area are similar to the wide range of pay opportunities within each subarea. By contrast, wives' earnings diverge significantly across the employment landscape. Women working

²⁴In contrast to an analysis of variance F-test, which evaluates a single null hypothesis of equal means across different groups, multiple-comparison tests tell us "which means differ from which other means." SAS Institute (1988). *SAS User's Guide: Statistics*. Version 5 Edition. Cary, NC: SAS Institute, p. 470. Many multiple-comparison tests are error-prone, however, since repeated comparisons at a given level increase the probability of making *at least one* Type I error (falsely rejecting the null hypothesis). To guard against this type of error I use Scheffe's test, which declares two means different only if an overall F-test (for all means in a given analysis) is significant.

²⁵The latter figure refers to the entire, eleven-county Metropolitan Statistical Area. U.S. Bureau of the Census (1991). *State and Metropolitan Area Data Book 1991*. Washington, D.C.: U.S. Government Printing Office, p. XXX.

Table 5.6. Average Annual Earnings of Husbands and Wives by Place of Work.

TCMA	Group 1: Central Cities				Group 2: South and West Suburbs				Group 3: North Suburbs				Group 4: Outlying Suburbs				Outside TCMA
	1500	2100	1600	1700	1900	2300	1200	1800	2200	1100	1300	1400	2000	2400			
All:																	
Husbands	\$39,003	40,769	38,743	39,086	41,368	40,709	39,664	38,809	37,421	41,212	34,371	32,691	37,293	42,315	38,378	37,134	
Index:	1.00	1.04	0.99	1.00	1.06	1.04	1.02	0.99	0.96	1.06	0.88	0.84	0.96	1.08	0.98	0.95	
Wives	\$20,416	23,761	21,095	20,002	20,275	20,050	18,363	17,530	17,861	19,345	15,778	14,915	16,217	14,002	15,426	16,858	
Index:	1.00	1.16	1.03	0.98	0.99	0.98	0.90	0.86	0.87	0.95	0.77	0.73	0.79	0.68	0.76	0.82	
Full-Time																	
Husbands	\$38,065	39,476	38,073	37,876	38,542	39,934	38,498	36,212	36,743	39,331	34,306	31,661	35,114	44,075	35,273	34,409	
Index:	1.00	1.04	1.00	1.00	1.01	1.05	1.01	0.95	0.97	1.03	0.90	0.83	0.92	1.16	0.93	0.90	
Wives	\$22,495	26,510	23,693	23,047	22,462	22,968	21,378	20,371	20,604	22,401	18,566	17,592	20,372	17,888	18,002	19,458	
Index:	1.00	1.18	1.05	1.02	1.00	1.02	0.95	0.91	0.92	1.00	0.83	0.78	0.91	0.80	0.80	0.86	

Analysis of Variance (Scheffe's multiple-comparison test, at P=0.05).

All Husbands: None.

Full-time Husbands: None.

All Wives:

PUMA 1500 (Minneapolis) exceeds all others except PUMA 2100 (St. Paul).

PUMA 2100 (St. Paul) > PUMAs 1100, 1300, 1400, 2000, 2400.

PUMA 1600 (Bloomington) > PUMAs 2000, 2400.

PUMA 1700 (Edina) > PUMAs 1100, 2000, 2400.

PUMA 1900 (Golden Valley) > PUMAs 2000, 2400.

PUMA 2200 (N. Ramsey Co.) > PUMA 2000.

PUMA 1500 (Minneapolis) > PUMAs 1100, 1200, 1300, 1400, 1700, 2000, 2200, 2300, 2400.

PUMA 2100 (St. Paul) > PUMAs 1100, 2400.

Notes:

1. Sample Size, N=7,984; number in which both husband and wife work at least 30 hours per week, N=5,880.

Data Source: U.S. Bureau of the Census (1992). 1990 Census of Population and Housing, Public-Use Microdata Sample (5% file).

Washington, D.C.: U.S. Government Printing Office.

in the city of Minneapolis garner substantially higher wages than women employed anywhere else in the metropolitan area, while suburban wives' earnings are highest in the affluent south and west suburbs. Interestingly, wives' earnings do not vary in tandem with those of husbands: wives' annual earnings are lowest, at \$14,000, in the outlying suburbs of Hennepin County, where husbands garner three times this amount.

In part earnings variations stem from differences in labor-force attachment, with participation rates declining outward from the central cities, and the incidence of part-time work increasing in peripheral areas. These relations are particularly strong among married women beyond the second tier of suburbs (Figure 4.9, Chapter 4). Yet wage disparities remain even when we narrow the analysis to full-time dual-earner households. Wives employed full-time in Minneapolis earn a fifth more than their counterparts in the south and west suburbs, and 40 percent more than women holding full-time employment in the diffuse network of jobs in the outlying suburbs (Table 5.6).

These variations likely reflect the combined forces of labor demand, and the spatial concentration of high-paying job opportunities available to women. Yet the same regularities persist even within the same segments of the occupational and industrial structure. I partition the dual-earner sample into five occupational categories within each of nine industries, and I use an analysis of variance F-ratio to assess the significance of earnings differences by place of work (Table 5.7).

In the male-dominated manufacturing sector, earnings variations exhibit a relatively complicated pattern. Earnings vary significantly by place of work for wives employed full-time in the nondurable goods sector, possibly reflecting an earnings premium required by the concentrated labor demand of 3M and other suburban centers. Wages also vary for both husbands and wives employed in blue-collar occupations in the durable goods sector. This latter finding likely reflects the combined influence of high labor demand in low-density suburban labor markets north of St. Paul, as well as higher-paying skilled work in the western suburbs.²⁶

²⁶Average annual earnings for men employed in skilled manufacturing work exceed \$50,000 in northern Ramsey County (PUMA 2200). This earnings premium appears consistent with the arguments of Scott, who argues that the concentrated labor demand of suburban firms can intersect with the marginal effects of commuting costs in diffuse residential areas to bid up local wage rates. Scott, A.J. (1988), *op. cit.*, Chapter 7.

Table 5.7. Analysis of Variance of Annual Earnings by Place of Work, Occupation by Industry.

	F-ratios From Analysis of Variance			
	<i>All Dual-Earners (N=7,984)</i>		<i>Full-time Workers (N=5,880)</i>	
	Husbands	Wives	Husbands	Wives
Nondurable Goods Mfg. (100-222)	2.25 ***	2.54 ***	1.23	1.95 ***
Managerial & professional specialty	1.74 *	0.41	1.10	0.60
Technical, sales, & admin. support	1.00	3.11 ***	0.86	1.41
Services	†	†	†	†
Precision production, craft, & repair	1.29	†	1.25	†
Operators, fabricators, & laborers	1.23	1.51	1.36	2.89 ***
Durable Goods Manufacturing (230-392)	2.10 ***	2.10 ***	2.40 ***	1.49
Managerial & professional specialty	1.15	1.13	1.54 *	1.22
Technical, sales, & admin. support	2.10 **	1.99 **	1.80 **	1.49
Services	†	†	†	†
Precision production, craft, & repair	1.49	2.25 **	1.46	2.46 **
Operators, fabricators, & laborers	2.78 ***	2.77 ***	3.96 ***	2.61 ***
TCU (400-472)	0.97	1.58 *	0.75	1.50
Managerial & professional specialty	0.80	1.47	1.35	1.35
Technical, sales, & admin. support	0.98	0.98	0.80	0.97
Services	†	†	†	†
Precision production, craft, & repair	0.76	†	0.56	†
Operators, fabricators, & laborers	0.72	†	0.78	†
Wholesale Trade (500-571)	0.75	1.58 *	0.80	1.04
Managerial & professional specialty	0.53	0.73	0.73	0.90
Technical, sales, & admin. support	0.47	1.22	0.60	0.76
Services	†	†	†	†
Precision production, craft, & repair	2.38 ***	†	2.25 **	†
Operators, fabricators, & laborers	1.92 **	†	1.20	†
Retail Trade (580-691)	0.95	3.15 ***	1.25	2.77 ***
Managerial & professional specialty	1.04	1.44	0.89	1.06
Technical, sales, & admin. support	0.97	1.69 *	1.40	1.69 *
Services	1.27	0.89	†	0.90
Precision production, craft, & repair	1.26	†	1.11	†
Operators, fabricators, & laborers	0.69	†	0.78	†
Finance, Insurance, and Real Estate (700-712)	1.52 *	2.98 ***	1.15	2.36 ***
Managerial & professional specialty	1.00	0.99	0.51	1.15
Technical, sales, & admin. support	1.45	2.49 ***	1.33	1.72 **
Services	†	†	†	†
Precision production, craft, & repair	†	†	†	†
Operators, fabricators, & laborers	†	†	†	†

Notes:

*F-ratio significant at P=0.10; **P=0.05; ***P=0.01.

†Fewer than 50 observations in occupation/industry category.

Table 5.7. (Continued).

	<i>F-ratios From Analysis of Variance</i>			
	<i>All Dual-Earners (N=7,984)</i>		<i>Full-time Workers (N=5,880)</i>	
	Husbands	Wives	Husbands	Wives
Business and repair services (721-760)	0.75	2.89 ***	0.60	3.10 ***
Managerial & professional specialty	0.87	1.20	0.75	1.71 *
Technical, sales, & admin. support	1.98 **	1.73 *	1.58	1.84 **
Services	†	†	†	†
Precision production, craft, & repair	1.04	†	1.22	†
Operators, fabricators, & laborers	†	†	†	†
Professional & related services (812-893)	0.80	9.25 ***	1.41	5.50 ***
Managerial & professional specialty	0.99	3.38 ***	1.60 *	2.98 ***
Technical, sales, & admin. support	1.67 *	4.56 ***	1.49	2.51 ***
Services	1.48	1.82 **	1.57	0.94
Precision production, craft, & repair	†	†	1.41	†
Operators, fabricators, & laborers	†	†	†	†
Public Administration (900-932)	1.34	1.94 **	1.05	1.81 **
Managerial & professional specialty	0.71	2.52 ***	0.60	2.09 **
Technical, sales, & admin. support	2.43 **	1.57	†	1.39
Services	1.64	†	2.05 **	†
Precision production, craft, & repair	†	†	†	†
Operators, fabricators, & laborers	†	†	†	†

Notes:

*F-ratio significant at P=0.10; **P=0.05; ***P=0.01.

†Fewer than 50 observations in occupation/industry category.

Data Source: U.S. Bureau of the Census (1992). 1990 Census of Population and Housing, Public-Use Microdata Sample. Washington, D.C.: U.S. Government Printing Office.

Place of work exerts substantial effects on the earnings of wives in the service sector. In all sectors in which women predominate--retail trade, finance, insurance, and real estate, business and professional services, and public administration--wives' earnings vary significantly by place of work, while husbands' earnings remain constant across workplaces. These regularities also hold when we narrow the analysis to full-time workers, suggesting that labor-force status provides only a partial explanation for variations in women's earnings.

Conclusions

We have explored the complex tapestry of the metropolitan labor market in several complementary ways. In the aggregate, the workplaces of men and women trace out remarkably similar employment concentrations in the metropolitan area; yet the opportunities available to workers living in different parts of the city vary widely, as do *intra*-household gender differences in commuting patterns.

The relation between conventional indicators of socioeconomic status and the geographical structure of local labor markets implies an underlying paradox in the geography of social class among men and women. Male occupational and industrial segmentation remains a reliable indicator of classically-derived patterns of residential differentiation, even though the geography of earnings opportunities fails to vary accordingly. By contrast, women from across the entire spectrum of the city's neighborhoods share similar experiences of occupational sex segregation in the workplace, bringing some degree of status heterogeneity into neighborhoods that may be homogeneous with respect to male social class. Yet this "non-pattern" corresponds to significant geographical variations in earnings for married women, even among workers occupying the same position in the labor force. This contextual variation--along with the failure of standard descriptors of women's employment to partition the urban fabric--leads us to explore more carefully the relation between gender and socioeconomic indicators used as surrogates of "social class." We turn to this issue in the next chapter.

CHAPTER SIX
GENDER, SOCIAL CLASS, AND THE JOURNEY TO WORK

Introduction

Since the late 1960s, literally hundreds of studies have investigated the relations between urban travel patterns and the socioeconomic characteristics, perceptions, and constraints of individual workers.¹ By the early 1970s the persistent finding of gender differences in urban spatial behavior, particularly in the work journey, had spawned several debates over the role of gender in broader urban theory. Explanations spanned the full range between "home" and "work," from theories relating women's restricted mobility to patriarchal relations in the domestic realm, to those blaming the dynamics of occupational sex segregation in the workplace.²

Despite a growing body of research on the processes by which men and women find different kinds of work, there has been little examination of how these processes vary *within* urban areas. Furthermore, with few notable exceptions, scholars fail to explore how the patterns themselves vary across the metropolis. Does the gender gap in work travel, for example, vary from one kind of neighborhood to another? If so, what sociological variables contribute to this variation?

In this chapter I examine the relations between social class and the work journey for men and women, sketching out some of the socioeconomic relations prevailing within the boundaries of the labor markets mapped in Chapter 5. Next, I analyze the manner in which gender differences in urban travel vary across the study area, drawing on the dual-earner TBI database. Women in all neighborhoods travel less than men, but the gender gap narrows in central cities and in densely-developed and upper-middle-class suburban areas.

In the third section I turn to the dual-earner PUMS database to document variations in social class across the study area, paying particular attention to

¹For a concise review, see Hanson, S., ed. (1995). *The Geography of Urban Transportation*. [Second edition, forthcoming]. New York: Guilford Press.

²For the best review of these competing explanations, see Hanson, S., and G. Pratt (1995). *Gender, Work, and Space*. London: Routledge, Chapter 1.

occupational differences between husbands and wives. While census-based employment categories provide an imperfect surrogate for social class, the magnitude of occupational segregation supports feminist arguments that women's entry into the paid labor force introduces some degree of class heterogeneity into the dual-earner family. Several additional indicators of social class vary widely across the metropolitan area, reflecting the distinct character of housing submarkets and local job opportunities. This analysis reveals persistent divisions in the spatial containment and opportunity structure of local labor markets for men and women.

In the fourth section, I correlate the gender gap in worktrip length to a series of behavioral variables, then analyze how these relations vary across the study area. In line with many behavioral studies, the results confirm that women's shorter commutes reflect their greater domestic responsibilities, part-time work, occupational sex segregation, and lower incomes. The gender gap correlates with distinct behavioral variables in different settings, however, and only two explanations--part-time employment and income inequality--apply throughout all parts of the study area. Finally, I undertake a multivariate statistical analysis of commuting time among wives in the fully-employed dual-earner sample. I summarize the main findings of several exploratory analyses and preliminary models, and I present the results of a model relating wives' commutes to labor-market segmentation and earnings. The final model specifications provide further evidence of substantial contextual effects on the determinants of wives' commuting times, underscoring the need for comparative perspectives in the interpretation of observed differences in worktrip length.

Gender Differences in Urban Travel

As expected, the dual-earner TBI database confirms the now familiar finding that travel patterns diverge markedly between men and women. On average, men spend slightly more than 90 minutes each day to travel more than 40 miles, while women spend just under 80 minutes to cover 33 miles (Table 6.1).

Daily travel varies widely across the metropolitan area, and total time and distance generally vary in tandem for men and women. For men living in the diffuse, low-density suburban areas of western Hennepin County (PUMA 2000), the daily routine consumes nearly 100 minutes of the average weekday spent covering more than 50 miles. For those living in the first-tier suburbs directly west of

Table 6.1 Travel Behavior Measures, Dual-Earner TBI Households.

	Group 1: Central Cities											
	TCMA				Puma 1500 (Minneapolis)				Puma 2100 (St. Paul)			
	Men	Women	Difference	Men	Women	Difference	Men	Women	Difference	Men	Women	Difference
Hours worked per week	44.0	36.5	7.53	43.0	37.7	5.32	42.9	36.8	6.10			
Number of trips	5.1	5.1	-0.05 *	5.3	5.1	0.22 *	5.1	5.0	0.06 *			
Total time in travel	91.3	77.5	13.8	86.0	78.2	7.76 *	84.0	72.9	11.10			
Total distance traveled	41.6	33.0	8.66	33.5	26.6	6.91	31.5	25.8	5.73			
Time in work travel	28.7	22.3	6.39	24.9	21.9	2.99	23.7	20.4	3.30 *			
Distance in work travel	14.0	10.2	3.79	10.5	7.9	2.61	9.8	7.8	2.00			

	Group 2: South and West Suburbs															
	Puma 1600				Puma 1700				Puma 1900				Puma 2300			
	Men	Women	Difference	Men	Women	Difference	Men	Women	Difference	Men	Women	Difference	Men	Women	Difference	
Hours worked per week	44.9	34.1	10.9	44.9	37.4	7.46	43.3	37.9	5.45	44.5	37.4	7.03				
Number of trips	5.4	5.3	0.13 *	5.3	5.0	0.27 *	4.8	4.7	0.14 *	5.1	5.4	-0.24 *				
Total time in travel	91.0	70.8	20.2	93.8	77.4	16.4	75.7	68.2	7.50 *	90.9	79.8	11.1				
Total distance traveled	37.9	26.5	11.4	40.5	31.2	9.28	29.2	26.3	2.95 *	44.1	35.5	8.58				
Time in work travel	27.3	18.6	8.62	28.9	21.8	7.08	24.3	21.3	3.03	29.1	22.7	6.39				
Distance in work travel	12.2	7.5	4.62	13.3	9.5	3.82	10.5	8.7	1.81	15.1	11.3	3.76				

*T-value from paired comparison t-test not significant at $P \leq 0.05$ (two-tailed).

Minneapolis (PUMA 1900) daily travel involves just over 75 minutes to traverse 30 miles. The dense agglomeration of jobs and commercial districts close to middle-class neighborhoods in Golden Valley and St. Louis park requires comparatively less travel, and likely permits a greater share of discretionary and recreational travel. Women living in Golden Valley and St. Louis Park spend 68 minutes traversing 26 miles, while those living in western Hennepin County spend an hour and a half covering more than 40 miles (Table 6.1).

Men's total travel exceeds that of women across the entire region, by a margin of 14 minutes and nearly nine miles. Yet in a third of the sub-areas, total travel does not differ significantly by gender, measured either in terms of time or distance (Table 6.1). Moreover, men and women typically take the same number of trips per day--on average, five separate trip segments.³

Work-related travel exposes the most pronounced differences between men's and women's movement patterns. Across the study area, men spend an average of six minutes more in work travel than women. This margin ranges from insignificant values in St. Paul (PUMA 2100) to ten minutes--a gap of some five miles--in the working class suburbs north of Minneapolis (PUMA 1200) and the outlying areas of Hennepin County (PUMA 2000) (Table 6.1). In the main, men's work travel appears to vary directly in relation to the density of local employment opportunities, with worktrips lengthening in diffuse, peripheral labor markets. Women's work travel generally conforms to this pattern, but in a much weaker relation (Table 6.1).

This analysis reiterates the now-familiar finding that gender mediates individual workers' movement through urban space. Yet the differences between men's and women's mobility is far from constant across the metropolitan settlement fabric, and the pattern implies deviations from the gradient portrayed in conventional urban land-rent models. Men's work travel varies directly in relation to employment density, tracing out the familiar increase in work journeys for those living in distant suburban neighborhoods. While women's worktrips suggest a

³Recall that TBI-defined trip segments record each departure and arrival separately, so that a stop for shopping on the way home from work counts as an additional trip. By definition, then, workers holding a single job have two "non-discretionary" trip segments tied to the workplace (if they go to work on the TBI survey date); those with more than one job might have three or even four non-discretionary segments. See footnote 17, Chapter 3.

similar pattern, time and distance spent in work travel fall within a narrower range. Moreover, women's labor markets are significantly more spatially contained than men's, regardless of the density of local employment opportunities.⁴ This effect is not symmetrical around the urban core, but instead reflects a more intricate intraurban geography of the jobs-housing balance.

The Geography of Social Class Among Dual-Earner Families

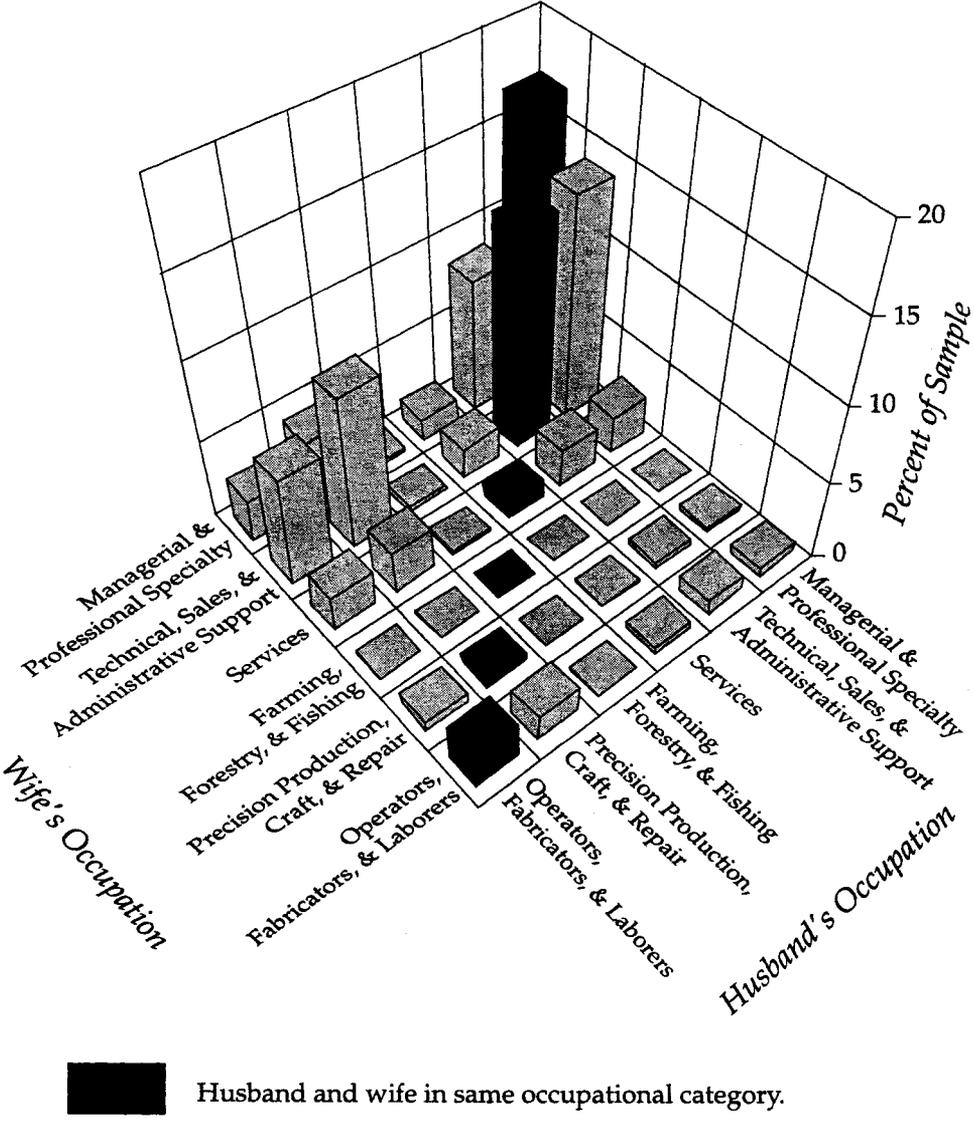
The persistence of occupational sex segregation and lower earnings among working women have prompted many feminists to argue that classifying married women on the basis of their husbands' social class conceals important heterogeneity within the contemporary American family.⁵ As a first cut in evaluating the empirical validity of this argument, I tabulated a series of surrogate indicators of social class for husbands and wives in the dual-earner PUMS sample. To sketch out some of the contrasts between the work experiences of men and women, I first focus on the most well-documented features of women's employment--occupational sex segregation and earnings disparities. Then I analyze how these vary across the metropolitan area. Finally, I tabulate a set of six "gender gap" variables to capture the disparities in a set of socioeconomic indicators for a subset of the dual-earner sample; I use these measures to analyze how gender mediates the varied character of local labor markets within the metropolitan area.

The sheer magnitude of occupational sex segregation lends support to the feminist challenge to conventional research on social stratification. Accepting the broad, one-digit occupational codes, in fewer than one third of the dual-earner families do husbands and wives work in the same job category (Figure 6.1). In the remaining two-thirds of the sample, the pattern mirrors the well-documented overrepresentation of women into low-level clerical and service jobs. Among husbands holding managerial and professional employment, more than 40 percent have wives in the technical, sales, and administrative support category; the comparable figure is nearly half for men in production jobs.

⁴Wyly, E.K. (1995). "Gender differences in urban travel." Paper presented at the Sixth annual Transportation Research Conference of the Center for Transportation Studies. Minneapolis: University of Minnesota.

⁵Abbott, P., and R. Sapsford (1987). *Women and Social Class*. London: Tavistock.

Total number of households: 226,360
 Sample Size: 8,039



©1995 Elvin K. Wylie

Figure 6.1. Occupation of Wife and Husband, Dual-Earner PUMS Sample.
 Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

The segmentation of husbands and wives into different kinds of work reinforces wide disparities in earnings (Figure 6.2). Wives garner less than half the earnings of their husbands in more than 45 percent of the sampled households. This wide gulf prevails across nearly all income levels, with wives earning more than their husbands in fewer than one fifth of the families. Although differences in part-time employment and job-tenure are complexly intertwined with patterns of labor-market segmentation, the sheer magnitude of the earnings gap is nothing short of astonishing. The level of inequality in the contemporary dual-earner household constitutes an important backdrop for the way work is organized in the North American city: recall that this sample of dual-earner families comprises more than a third of the regional workforce of the Twin Cities.

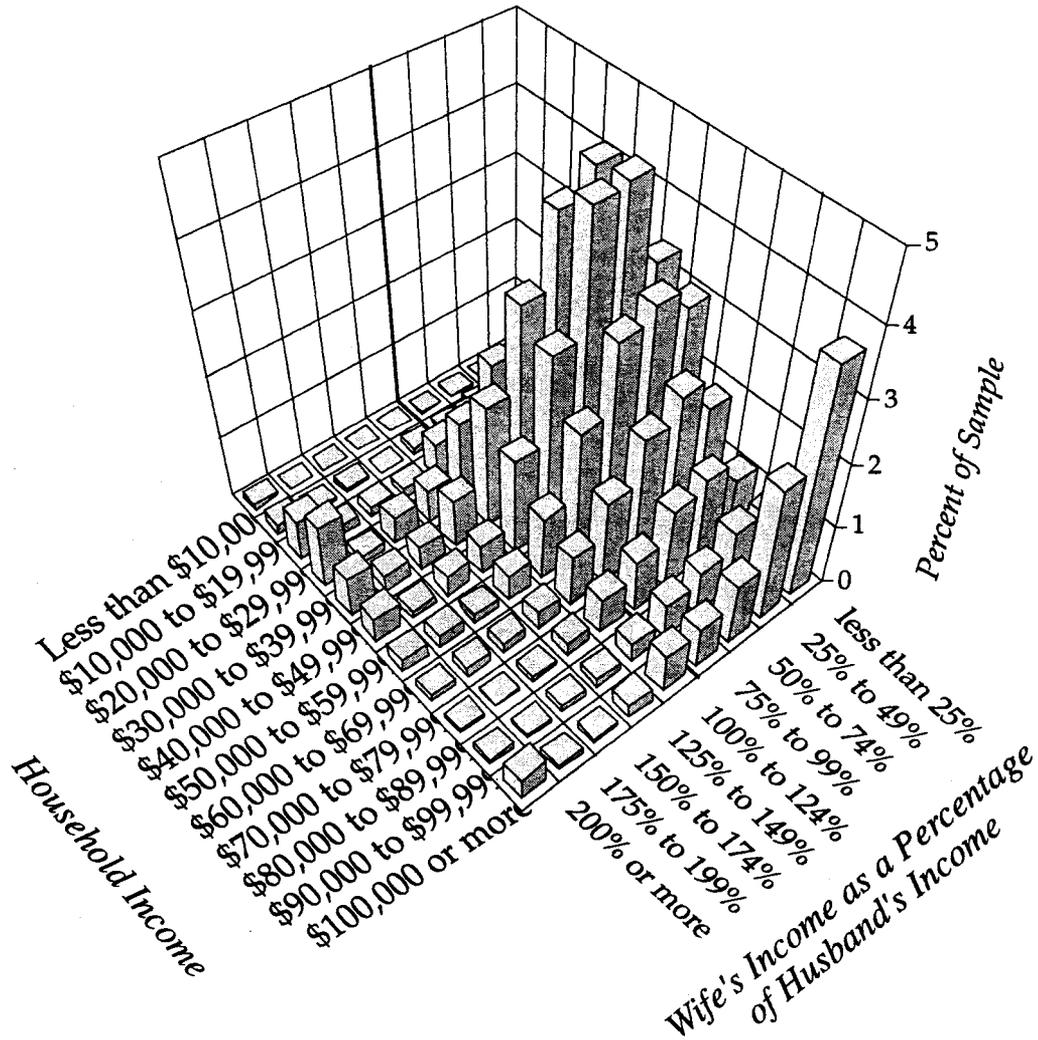
Analysts typically study patterns of occupational sex segregation and income inequality for the labor force as a whole. The striking divisions in the dual-earner sample confirm that such patterns persist across a wide range of income levels for a single household type. The restrictive criteria imposed on the dual-earner sample have the effect of oversampling higher-income families living in single-family homes in commuter suburbs--a group at the center of recent debates over the implications of gender differences in urban travel.⁶ Yet despite this slight bias, the profile of the dual-earner sample provides evidence of occupational segregation and income inequality throughout a broad portion of the middle class.

Occupational differences divide dual-earner families into several distinct categories (Figure 6.1; Table 6.2). The most striking divisions follow the historic dichotomy between manual and non-manual labor, separating families with blue-collar husbands from those with white-collar husbands.⁷ Households with white-collar husbands include some 38,000 "dual-professional" couples, in which both

⁶These restrictions boost the median annual household income for the dual-earner sample to \$54,000, compared with just under \$37,000 for the metropolitan area as a whole. Even so, the dual-earner sample does not appear unreasonably biased toward affluent families, since the MSA figure includes a number of exurban counties on the fringe of the metropolitan economy. Among all families in the seven-county TCMA, more than 40 percent have incomes over \$50,000. Metropolitan Council (1992). *Trouble at the Core*. St. Paul, MN: Metropolitan Council, p. 12.

⁷The "blue-collar/white-collar" distinction is technically incorrect, since the Census occupational categories are no longer based on the explicit criterion of manual labor. I retain this terminology, however, because despite the revisions to the classification in the late 1970s, most analysts agree that the new system replicates the broad outlines of the class structure portrayed in the earlier system. See Stevens, G., and J.H. Cho (1985). "Socioeconomic indexes and the new 1980 census occupational classification scheme." *Social Science Research* 14, 142-68.

Total number of households: 226,360
 Sample Size: 8,039



© 1995 ELVIN K. WYLY

Figure 6.2. Gender Gap in Income by Household Income, Dual-Earner PUMS Sample. Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

Table 6.2. Distribution of Dual-Earner Household Types.

Household Type	Occupation		Group 1:				Group 2:				Group 3:				Group 4:			
	Husband	Wife	Central Cities		South and West Suburbs		North Suburbs		Outlying Suburbs		Central Cities		South and West Suburbs		North Suburbs		Outlying Suburbs	
			TCMA	1500 2100	1600	1700 1900 2300	1200	1800 2200	1100	1300 1400 2000 2400	1500	2100	1600	1700 1900 2300	1200	1800 2200	1100	1300 1400 2000 2400
Dual-Professional	I. Managerial	Managerial	17.0	24.1	18.4	17.8	26.7	22.0	16.6	11.3	11.7	22.8	10.5	7.7	17.8	17.6	9.8	
White/Pink Collar	II. Managerial	Tech./Admin.	14.0	10.1	14.3	15.9	19.3	12.4	18.1	11.1	12.3	17.0	11.7	10.0	13.2	14.6	13.4	
	III. Tech./Admin.	Managerial	8.6	8.7	7.7	11.6	12.3	7.4	10.1	8.1	7.4	10.0	9.3	8.2	6.7	10.4	5.3	
Dual-Technical	IV. Tech./Admin.	Tech./Admin.	13.7	13.7	11.3	14.8	15.2	15.6	18.4	14.4	13.6	12.2	12.2	10.5	15.6	14.4	14.9	
Blue/Pink Collar	V. Craftsmen	Tech./Admin.	9.8	8.2	7.7	9.3	5.5	9.1	6.5	14.2	12.2	7.4	10.7	14.2	10.3	11.0	12.9	
	VI. Operators, etc.	Tech./Admin.	7.0	5.9	8.3	4.8	2.6	6.1	5.8	7.0	10.5	4.7	10.4	9.4	7.7	5.4	8.4	
	Not Classified		29.9	29.3	32.3	25.8	18.4	27.4	24.5	33.9	32.3	25.9	35.2	40.0	28.7	26.6	35.3	
	Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file.* [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

spouses hold managerial or professional employment; and approximately 50,000 families with a mixed, "white/pink-collar" occupational character. Both spouses hold jobs in the technical, sales, and administrative support category in about 20,000 families. Among households with blue-collar husbands, two groups may be characterized as "blue/pink-collar."

The distribution of these categories across the metropolitan area reflects broader residential patterns rooted in the geographies of socioeconomic status, family structure, and housing class.⁸ Within the central cities, the dual-earner sample appears biased toward enclaves of professional couples in affluent neighborhoods in South Minneapolis and St. Paul's Highland Park. Dual-professional couples comprise more than a quarter of the Minneapolis sample (Table 6.2). The south and west suburbs also retain a heavily white-collar character, underscoring the prominent role of these neighborhoods in the regional service economy. Dual-professional couples account for more than a quarter of the sample in the second-ring suburbs west of Minneapolis (PUMA 1700), and in another third of the families at least one spouse holds managerial or professional employment (Table 6.2). The growing base of retail and service employment in this part of the region has also carved out pools of lower-status clerical employment, however. Thus the southwest quadrant of the study area includes a large number of upper-income professional men married to women in clerical employment--families that exemplify the upper-middle-class variant of the pink-collar ghetto portrayed in 'spatial entrapment' research.⁹

In contrast to the affluent character of the south and west suburbs, the northern half of the region retains a distinctly working-class character rooted in the axis of rail and industrial functions following the Mississippi. Dual-professional couples comprise barely a tenth of the sample in the suburbs north and west of Minneapolis (PUMAs 1200 and 1800). Mixed blue/pink-collar families comprise more than a quarter of the households, with husbands working in production and operative jobs at manufacturing centers along the Highway 10 corridor, and in a wide band of industrial districts spilling out of northeast Minneapolis. The

⁸For a recent analysis in the factorial ecology tradition, see Komoto, C.T. (1994). *Intraurban Migration in the Minneapolis-St. Paul Metropolitan Area*. Unpublished Ph.D. Thesis. Minneapolis: University of Minnesota, Chapter 7.

⁹England, K.V.L. (1993). "Suburban pink-collar ghettos: The spatial entrapment of women?" *Annals of the Association of American Geographers* 83(2), 225-42.

northern suburbs include a large number of men engaged in comparatively low-status (albeit well-paying) work, married to women holding poorly-paid clerical jobs--families that exemplify the lower-middle class variant of the pink-collar ghetto portrayed in feminist urban research.¹⁰

The diffuse settlement matrix on the northeast side of the metropolitan area carves out a notable exception to the prevailing class character of the northern suburbs. Owing to the Census Bureau's boundary definitions, a single sub-area encompasses all of northern Ramsey County (PUMA 2200). The sample for this portion of the study area thus stretches all the way from working-class districts surrounding a former U.S. Army munitions plant in the northwest portion of the county, to exclusive residential enclaves resembling the upper-middle class housing sectors on the opposite side of the metropolitan area. This subarea thus includes a substantial number of families typical of the upper-middle class variant of the pink-collar ghetto, but in unique setting that is not comparable to that of other parts of the study area.

The final group of households is drawn from the outlying suburbs of the metropolitan region. In general, dual-earner families in these low-density labor markets are distributed evenly across the occupational categories, reflecting the diversity of neighborhoods and employment centers in the large, expansive areas defined by the Bureau of the Census. One sub-area encompasses both Carver and Scott Counties, for instance, thereby grouping together exurban communities tightly integrated into Greater Minnesota's agricultural economy with rapidly-growing neighborhoods adjacent to Eden Prairie at the western frontier of the region's most prominent development corridor.

The distinct social and economic character of each of these submarkets help to forge the geographical context in which husbands and wives balance life at home with the need to reach suitable job opportunities. My central thesis is that husbands' and wives' social and economic characteristics correlate with observable spatial outcomes--i.e., discernably shorter (or longer) work journeys--in a contingent and varied manner across the study area. As a first cut in assessing the validity of

¹⁰Wekerle, G.R., and B. Rutherford (1989). "The mobility of capital and the immobility of female labor: Responses to economic restructuring." In Wolch, J., and M. Dear, eds., *The Power of Geography: How Territory Shapes Social Life*. Winchester, MA: Unwin Hyman, 139-72.

this argument, I perform a simple tabulation of socioeconomic characteristics of a subsample of the dual-earner families drawn from the PUMS files. I focus on "fully-employed" dual-earner families, in which both spouses worked at least 30 hours in the week prior to census day and were employed at least 15 hours per week throughout the previous year. To develop surrogate indicators of gender differences in labor-market experiences in dual-earner families, I tabulate six "gender gap" variables to capture husband-wife differences in income, estimated hourly wages, occupational prestige, educational attainment, hours of work, and commuting time (Table 6.3).¹¹

This simple tabulation reveals striking contrasts in the employment circumstances of husbands and wives (Table 6.3). While both spouses have roughly similar educational backgrounds and occupational prestige, women earn only 52 cents for every dollar garnered by their husbands. In part, the earnings gap reflects women's greater reliance on part-time work, with husbands working an average of nearly eight hours longer per week. Yet part-time work status is insufficient to account fully for the disparity in earnings. At more than \$17.00, husbands' gross hourly wages outstrip those of their wives by nearly six dollars. Husbands earn an average of \$39,000 per year, more than \$18,000 more than their wives.

This procedure also highlights intriguing contextual variation in the way wives' employment experiences differ from those of their husbands--that is, the gender gap variables themselves fluctuate across the urban fabric.¹² Without exception, dual-earner families living in the central cities exhibit significantly *smaller* disparities than their counterparts living in suburban neighborhoods. Wives' incomes fall short of that of their husbands by an average of roughly \$12,000

¹¹All of these variables are drawn or calculated directly from the PUMS files except for the occupational prestige score, which is taken from the 1989 General Social Survey of the National Opinion Research Center; see footnote 13, Chapter 3. The PUMS unfortunately do not permit any meaningful analysis of the role of children in the dual-earner family: while we have separate income figures for each spouse, for example, we have no information on child-care arrangements. Moreover, the criterion of sustained labor-force participation throughout the previous year excludes most mothers of young children. Taken together, the restrictions narrow the sample from approximately 8,000 households to just over 5,000 families.

¹²To examine geographical variations in the gender gap measures, I aggregate the fourteen PUMAs of the study area into four broader groups: central cities, south and west suburbs, north suburbs, and outlying suburbs. This aggregation entails a considerable loss of geographical detail, but keeps the analysis of statistically-significant areal variation manageable. I use Scheffe's multiple-comparison test as a rigorous test of the significance of differences between means of each respective pair of gender gap variables among the four sub-areas. See footnote 26, Chapter 5.

Table 6.3. Gender Differences by Place of Residence.

Gender gap variables* TCMA**	Group 1: Central Cities				Group 2: South and West Suburbs				Group 3: North Suburbs				Group 4: Outlying Suburbs			
	1500	2100	1600	1700	1900	2300	1200	1800	2200	1100	1300	1400	2000	2400		
Personal income	\$18,507	12,364	11,659	16,163	27,390	18,115	19,532	17,761	15,927	20,251	18,025	14,115	20,508	22,058	19,561	
Estimated hourly wage	\$5.77	3.65	3.63	3.94	8.19	6.19	6.04	5.56	4.58	5.20	6.33	4.66	7.82	6.30	6.52	
Occupational prestige	-0.13	-1.62	-2.21	0.43	1.73	-0.33	2.34	0.58	0.13	-0.20	-1.56	-2.42	-0.13	0.88	0.66	
Years of education	0.31	0.19	0.14	0.33	0.66	0.21	0.48	0.26	0.17	0.67	0.07	0.04	0.42	0.31	0.14	
Hours worked per week	7.55	5.01	5.66	7.04	9.47	6.80	7.56	7.69	7.29	8.89	7.84	6.63	7.27	7.82	9.10	
Travel time to work	3.26	1.32	2.60	1.93	3.04	2.36	3.20	4.51	2.58	3.23	4.37	3.94	3.24	2.74	5.49	

Analysis of Variance

(Scheffe's multiple comparison test, at $p=0.05$).

Variable	Significant differences between
Personal income	Groups 1 and 2, 1 and 3, 1 and 4, 2 and 4.
Estimated hourly wage	Groups 1 and 2, 1 and 4
Occupational prestige	Groups 1 and 2, 1 and 3, 2 and 4
Years of education	Groups 1 and 2, 2 and 4, 3 and 4
Hours worked per week	Groups 1 and 2, 1 and 3, 1 and 4
Travel time to work	Groups 1 and 4, 2 and 4

Notes:

*Amount by which the characteristic of the husband exceeds that of the wife.

**Dual-earner households living in the study area.

Gender gap variables shown in boldface indicate significant t-value from paired-comparison t-test (two-tailed, $p=0.05$).

Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file.* [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

in the central cities, compared with more than \$27,000 in the affluent neighborhoods of some of the suburbs south and west of Minneapolis. Wives in dual-earner families in the central cities actually hold jobs of significantly higher prestige than their husbands, although the margin of the gap is negligible.¹³

Many of these geographical patterns dissolve when the sample is partitioned by husbands' place of work (Table 6.4). Intra-household variations in income and wages, hours of employment, and occupational prestige remain constant across the metropolitan area, suggesting a geographically undifferentiated portrait of dual-earner families when viewed through the lens of men's labor markets. The difference between husbands' and wives' earnings, for example, ranges from just over \$16,000 in Carver and Scott Counties (PUMA 1100) to approximately \$21,000 for husbands working in northern Ramsey County (PUMA 2200); these figures compare to a range between \$12,000 and \$27,000 by place of residence (Table 6.4; Table 6.5). The sole variable to attain statistical significance in the analysis of variance is commuting time. Husbands working in Minneapolis and St. Paul respectively commute an average of 4.5 minutes and 3.9 minutes longer than their wives, compared with negligible differences for husbands working in the north suburbs and outlying areas. The gap in travel time approaches four minutes among husbands working in the south and west suburbs.

The role of contextual variations in local labor markets is accentuated when the sample is partitioned by wife's place of work (Table 6.5). Income, wages, and hours of employment vary significantly across the sub-areas, with wives employed in the central cities typically exhibiting less intra-household disparity. The variation is especially pronounced in the case of commuting time, which is significantly different among all of the sub-areas of the study area. Wives working in the central cities commute as far as their husbands, while wives employed in nearly all of the suburban areas come from families with substantial gender gaps. Wives working in the dense labor markets of the south and west suburbs commute between 1 and 5 minutes shorter than their husbands; but for wives working in the diffuse network of service, retail, and clerical job centers in the north suburbs and outlying areas, the gender gap in worktrip length approaches ten minutes or more. This pattern almost certainly reflects the relative inelasticity of wives' commutes relative to husbands.

¹³The GSS occupational prestige score is scaled to an interval-ratio measurement scale, and effectively ranges from just under 20 to around 90. See footnote 13, Chapter 3.

Table 6.4. Gender Differences by Husband's Place of Work.

Gender gap variables* TCMA**	Group 1: Central Cities			Group 2: South and West Suburbs			Group 3: North Suburbs			Group 4: Outlying Suburbs					
	1500	2100	1600	1700	1900	2300	1200	1800	2200	1100	1300	1400	2000	2400	
Personal income	\$18,507	17,032	17,240	19,263	20,226	18,056	19,167	18,797	15,907	20,693	16,233	17,002	17,457	22,387	19,955
Estimated hourly wage	\$5.77	5.16	6.06	5.70	6.91	5.63	6.84	6.24	4.47	4.41	5.23	5.78	7.32	6.34	5.77
Occupational prestige	-0.13	-0.41	-0.49	0.56	0.84	-0.46	-1.77	-0.32	-0.60	0.02	-0.97	-0.23	-0.94	-0.56	0.53
Years of education	0.31	0.16	0.47	0.38	0.37	0.34	0.24	0.30	0.35	0.52	0.09	-0.13	0.37	0.17	0.16
Hours worked per week	7.55	7.09	7.75	8.22	7.31	6.79	7.00	7.59	7.20	8.22	7.19	8.50	6.54	9.33	8.28
Travel time to work	3.26	4.55	3.91	4.84	4.69	3.65	3.66	0.29	1.85	2.72	-0.77	-0.23	1.28	-1.77	-0.14

Analysis of Variance

(Scheffe's multiple comparison test, at $p=0.05$).

Variable	Significant differences between
Personal income	†
Estimated hourly wage	†
Occupational prestige	†
Years of education	Groups 3 and 4
Hours worked per week	†
Travel time to work	Groups 1 and 3, 1 and 4, 2 and 3, 2 and 4, 3 and 4

Notes:

*Amount by which the characteristic of the husband exceeds that of the wife.

**Dual-earner households living in the study area.

†NO significant differences between groups.

††Significant differences between ALL groups.

Gender gap variables shown in boldface indicate significant t-value from paired comparison t-test (two-tailed, $p=0.05$).

Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file.* [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

Table 6.5. Gender Differences by Wife's Place of Work.

Gender gap variables* TCMA**	Group 1: Central Cities				Group 2: South and West Suburbs				Group 3: North Suburbs				Group 4: Outlying Suburbs			
	1500	2100	1600	1700	1900	2300	1200	1800	2200	1100	1300	1400	2000	2400		
	Personal income	\$18,507	15,177	15,827	17,649	18,080	19,380	19,593	18,810	17,334	18,499	20,372	19,494	26,365	32,149	21,531
Estimated hourly wage	\$5.77	3.98	5.08	5.7	5.33	5.86	5.60	6.09	4.95	5.06	7.94	5.92	12.24	11.14	6.44	
Occupational prestige	-0.13	-1.45	-2.61	2.47	0.98	-1.26	2.62	-0.62	-0.83	1.09	-2.09	0.11	1.52	2.75	1.10	
Years of education	0.31	0.22	0.27	0.39	0.46	0.3	0.37	0.19	0.10	0.51	0.05	0.35	0.45	0.29	0.26	
Hours worked per week	7.55	6.79	6.29	6.65	6.52	7.64	8.39	8.48	7.61	8.45	8.44	9.47	8.79	10.78	9.21	
Travel time to work	3.26	-1.64	0.58	0.71	1.39	2.00	5.07	8.14	3.75	4.58	8.33	15.11	9.99	9.63	8.85	

Analysis of Variance

(Scheffe's multiple comparison test, at p=0.05).

Variable	Significant differences between
Personal income	Groups 1 and 2, 1 and 3, 1 and 4, 2 and 4, 3 and 4
Estimated hourly wage	Groups 1 and 4, 2 and 4, 3 and 4
Occupational prestige	Groups 1 and 2, 1 and 3, 1 and 4
Years of education	†
Hours worked per week	Groups 1 and 3, 1 and 4, 2 and 4
Travel time to work	††

Notes:

*Amount by which the characteristic of the husband exceeds that of the wife.

**Dual-earner households living in the study area.

†NO significant differences between groups.

††Significant differences between ALL groups.

Gender gap variables shown in boldface indicate significant t-value from paired comparison t-test (two-tailed, p=0.05).

Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file.* [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

In peripheral commuter suburbs, husbands typically journey to work in highly centralized commercial or manufacturing districts or the central cities, while their wives seek out local service employment. For wives working in northern Anoka County (PUMA 1300), these patterns stretch the gender gap in worktrip length to more than fifteen minutes (Table 6.5).

Intra-household inequality, then, appears in unique ways when viewed from the workplaces of men and women. This intriguing regularity is seemingly paradoxical, however, because it runs counter to the geography of men's employment documented in Chapter 5. Male occupational and industrial patterns remain reasonably reliable discriminators of residential districts in the metropolis, distinguishing, for example, affluent white-collar housing submarkets from working-class, blue-collar neighborhoods. Yet men's wages do not vary substantially across the region, an indication that earnings opportunities are not empirically correlated with the clear partitioning of the urban fabric suggested by the occupational and industrial data. Women, by contrast, remain concentrated in only a few occupations and industries, and the spatial structures of these labor markets provide poor discriminators of distinct residential areas in the metropolis. Nevertheless, earnings opportunities for women diverge widely across the urban fabric, and the level of intra-household inequality observable in labor-force tabulations depends critically upon where women work.

To more fully appreciate the relevance of these abstract statistical relationships, consider a series of hypothetical local labor market studies. First, assume an investigator wishes to explore the role of gender in rapidly-growing suburban labor markets, and thus focuses on affluent residential neighborhoods surrounding employment centers conforming to the stereotypical image of the "edge city" phenomenon. If a scholar undertakes a residence-based commuting study--interviewing men and women *living* in these suburban neighborhoods--then my findings indicate a high likelihood of uncovering striking levels of intra-household inequality with only moderate differences in journey-to-work patterns. Among dual-earner households living in the most affluent neighborhoods of the Twin Cities region, husbands' incomes outstrip those of their wives by more than \$27,000, with a corresponding gap in commuting time of only three minutes (PUMA 1700, Table 6.3).

Now consider a workplace-based commuting study, in which we interview a sample of workers employed in one or more companies located immediately adjacent to these affluent suburban neighborhoods. Assuming an investigator focuses on married women, there is a high probability of uncovering significant spousal disparities in income without *any* gap whatsoever in commuting time. My tabulations indicate that women working in suburban office concentrations in the affluent housing sectors south and west of Minneapolis typically commute almost as far as their husbands; the gap is significant in some of these areas, but only approaches one or two minutes on average (PUMAs 1700 and 1900, Table 6.5). Generalizations drawn from studies conducted in these areas would likely find little support for the idea that women's inequality is manifest in spatially-contained labor markets.¹⁴ Instead, analysts would be forced to examine women's strategies at a finer spatial scale—exploring, for example, how men and women sequence work hours to accommodate child care arrangements, and how many women rely on networks of friends in the residential neighborhood to care for their children.

Finally, consider a workplace-based commuting study set on the opposite side of the metropolitan area, perhaps in a low-density setting in which many of the men hold jobs in the manufacturing sector. A random sample of married women in this setting would likely reveal spousal differences in income that mirror those in more affluent settings, although the incomes of both spouses might fall short of those in companies on the wealthier side of town. Yet husbands and wives would be likely to report vastly different commuting times; my results uncover a gender gap on the order of more than eight minutes for wives working in the string of blue-collar suburbs stretching north from Minneapolis (PUMA 1200), and more than fifteen minutes for wives working in northern Anoka County (PUMA 1300) (Table 6.5). Generalizations drawn from case studies in these settings would typically find strong support for theories correlating gender inequality with women's more localized commutes.¹⁵

These findings suggest considerable contingency in the relations between gender and the geographical structure of local labor markets. Yet this simple analysis presented here fails to hold constant a number of important factors. It could be, for example, that the variation in socioeconomic variables and commuting

¹⁴For example, England, K.V.L. (1993), "Suburban pink-collar ghettos..." *op. cit.*

¹⁵For example, Wekerle, G.R., and B. Rutherford (1989). "The mobility of capital..." *op. cit.*

times is entirely the product of geographical variations in the skills and educational qualifications of workers in different parts of the city, and that controlling for these effects would remove most or all spatial variation in the gender-commuting time relation. To probe this set of factors I turn to a conventional behavioral analysis of the journey to work, followed by a more rigorous multivariate statistical assessment.

Behavioral Correlates of Gender Differences in Worktrip Length

The journey to work is the most easily observed outcome of the complex locational dependencies among workers and firms, and the recurrent link between workers' socioeconomic characteristics and their commuting behavior forms the cornerstone of most research on local labor markets. In those studies investigating the spatial dimensions of women's employment, analysts typically correlate work-trip length with family structure, part-time employment, occupational class, and income. I use simple analysis-of-variance procedures to investigate each of these factors in turn, returning to the full dual-earner PUMS sample of 8,000 families.¹⁶ I first examine each variable separately, and then I analyze the degree to which these effects vary across the study area.

Family structure

The most prevalent explanation of women's shorter worktrips exemplifies what one critical observer has dubbed the "tot-tethering theory" of female employment.¹⁷ Given the enduring gender division of labor within most American families, domestic and child-rearing responsibilities limit women's daily mobility and narrow the extent of their job-search networks. According to this theory, the spatial entrapment of women in their residential neighborhood is a product of patriarchy within the family. Increasing women's spatial mobility, therefore, would require an erosion of traditional gender roles; conversely, changes in the family potentially could alter travel patterns among married men. If this explanation

¹⁶For this stage of the analysis I focus on the entire dual-earner PUMS sample; excluding 30 households in which occupational data were incomplete or missing, we have a total sample size of 8,001 households corresponding to an estimated 450,000 workers. The statistical analysis takes a form similar to that of an unbalanced ANOVA. I evaluate the null hypothesis of no significant gender differences in worktrip length with a paired-comparison t-test; I assess differences between categories of each respective independent variable with an F-statistic, the ratio of between-group to within-group variance.

¹⁷Anonymous (1993). Comment on on-line internet discussion group. *GEOGFEM: Feminism and Geography* LISTSERV.

holds for the dual-earner sample, then a) the presence and age of children should influence worktrip length for both spouses; b) the effect should be greater for wives than for husbands; and c) the gender gap in worktrip length should be greatest in households with young children.

The data support most of these expectations. Presence and age of children exerts a significant influence on worktrip length for both husbands and wives, and the effect is most pronounced for wives (F-ratios, Table 6.6). Although wives' commutes fall short of husbands' in all categories, the largest gap (over five minutes) appears for mothers of young teenagers. This finding almost certainly reflects the biased measurement of census-defined work journeys: since these figures include trips to daycare on the way to work, they invariably understate the time- and space-constraints facing mothers of young children. Such biases underlie the counterintuitive finding that mothers of young children commute almost as far as their husbands (22.0 minutes vs. 23.3 minutes), and that wives without children report travel times nearly identical to mothers conventionally viewed as the *most* spatially entrapped (20.0 minutes vs. 20.1 minutes) (Table 6.6).

Husbands' worktrips also support an interpretation of women's commuting as an attempt to balance domestic labor with paid employment. While studies of the labor force as a whole typically reveal weak links between family structure and travel time for men, presence and age of children do appear to exert a substantial effect for husbands in the dual-earner sample (F-ratio, Table 6.6). Far from signifying an erosion of traditional gender roles, however, the data bolster an interpretation of mothers' spatial entrapment. The *longest* average commute for husbands (24.0 minutes) corresponds to the *shortest* for wives (18.7 minutes), suggesting that working mothers' more restricted mobility in some way enables the wider range of movement of married men (Table 6.6).

Employment status

Related to women's role in the domestic sphere is the predominance of part-time employment among married women, which contributes to a reluctance (and/or inability) to undertake long commutes. Nearly a quarter of wives in the sample work fewer than 30 hours per week, compared with only three percent of the husbands (Table 6.7; Table 6.8). If women's shorter worktrips reflect their greater reliance on part-time employment, then a) part-time work should shorten

Table 6.6. Gender Gap in Work Journey by Presence and Age of Children.

Presence and Age of Children	N	Estimated No. of Households	Average Travel Time To Work		
			Husband	Wife	Difference
1 Under 6 years only	1,311	37,393	23.3	22.0	1.36 *
2 Age 6 to 17 only	2,467	68,901	24.0	18.7	5.34 *
3 Under 6 and 6 to 17	838	23,881	23.8	20.1	3.67 *
4 No Children	3,385	95,068	22.6	20.0	2.52 *
Total	8,001	225,243	23.3	20.0	3.32 *
		F-ratios	5.96***	20.2***	

*F-ratio significant at P=0.10; **0.05; ***0.01.

*T-value from paired-comparison t-test significant at P=0.05.

Analysis of Variance for Difference in Travel Time:
(Scheffe's multiple-comparison test, at P=0.05)

Significant Differences between Groups

1 and 2

2 and 4

Data Source: U.S. Bureau of the Census (1992). Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

Table 6.7. Gender Gap in Work Journey by
Husband's Employment Status.

Husband's hours worked per week	N	Estimated No. of Households	Average Travel Time To Work		
			Husband	Wife	Difference
1 less than 30	249	6,960	21.5	20.3	1.13
2 30 to 40	339	9,803	22.3	20.0	2.27 *
3 more than 40	7,413	208,480	23.4	19.9	3.44 *
Total	8,001	225,243	23.3	20.0	3.32 *
F-ratios			3.32*	0.13	

*F-ratio significant at P=0.10; **0.05; ***0.01.

*T-value from paired-comparison t-test significant at P=0.05.

Analysis of Variance for Difference in Travel Time:

(Scheffe's multiple-comparison test, at P=0.05)

Significant Differences between Groups

None.

*Data Source: U.S. Bureau of the Census (1992). Public-Use Microdata Sample,
1990 Census of Population and Housing, Five percent file. [Machine-readable data file.]
Washington, D.C.: U.S. Government Printing Office.*

Table 6.8. Gender Gap in Work Journey by
Wife's Employment Status.

Wife's hours worked per week	N	Estimated No. of Households	Average Travel Time To Work		
			Husband	Wife	Difference
1 less than 30	1,924	54,013	23.4	16.8	6.62 *
2 30 to 40	1,360	37,766	22.9	18.7	4.17 *
3 more than 40	4,717	133,464	23.3	21.6	1.73 *
Total	8,001	225,243	23.3	20.0	3.32 *
F-ratios			0.69	111.63***	

*F-ratio significant at P=0.10; **0.05; ***0.01.

*T-value from paired-comparison t-test significant at P=0.05.

Analysis of Variance for Difference in Travel Time:

(Scheffe's multiple-comparison test, at P=0.05)

Significant Differences between Groups

All groups.

*Data Source: U.S. Bureau of the Census (1992). Public-Use Microdata Sample,
1990 Census of Population and Housing, Five percent file. [Machine-readable data file.]
Washington, D.C.: U.S. Government Printing Office.*

commutes for both spouses; b) the effect should be gender-specific; and c) the gender gap should be greatest for part-time wives.

The data support each of these expectations. For both spouses, average travel times decrease among part-time workers, but the effect is heavily gender-specific. Husbands' average commutes fall within a narrow range, with travel times of part-time workers (21.5 minutes) only two minutes shorter than those of men working more than 40 hours per week (Table 6.7). The gender gap in work travel disappears in households where husbands work fewer than 30 hours per week (Table 6.7). For wives, part-time employment greatly limits the time spent in the daily commute, with the gender gap approaching seven minutes in families where wives work less than 30 hours per week (Table 6.8).

Occupational Class

The third explanation for women's shorter worktrips is occupational segregation, which holds that women's employment in low-status, low-paying jobs provides little economic returns to long commutes. Occupational differences constitute the foundation of both behavioral and structuralist explanations of women's commuting: the former, derived from urban economics and human-capital theory, depicts women's choices as rational behavior in light of (exogenous) domestic responsibilities and cultural norms. The latter, exemplified by segmented labor-market theory, focuses on the rigidity of gender divisions in the workforce, and the way that employers' practices reinforce and reproduce such patterns.¹⁸ Either way, if occupational class correlates with women's more localized labor markets, then the gender gap should widen in households with high-status husbands (e.g., managers and professionals) and low-status wives (e.g., clerical workers).

The data provide ambiguous support for this expectation, due to the coarse nature of the one-digit census occupational categories, and because of varying rates of dispersal of different kinds of jobs. Occupational status exerts significant effects on the commuting times of both husbands and wives, but the magnitude of the variation is almost negligible--barely two minutes between the shortest and longest commutes for workers of the same sex (Table 6.9). As anticipated, the gender gap is

¹⁸Nelson, K. (1986). "Labor demand, labor supply, and the suburbanization of low-wage office work." In Scott, A.J., and M. Storper, eds., *Production, Work, Territory*. Boston: Allen and Unwin, 149-71.

Table 6.9. Gender Gap in Work Journey by Occupational Class.

Household Type	Occupation		Average Travel Time To Work		
	Husband	Wife	Husband	Wife	Difference
Dual-Professional	I. Managerial	Managerial	21.8	20.8	1.04 *
White/Pink Collar	II. Managerial	Tech./Admin.	22.6	19.2	3.31 *
	III. Tech./Admin.	Managerial	24.0	21.4	2.77 *
Dual-Technical	IV. Tech./Admin.	Tech./Admin.	23.6	19.6	4.03 *
Blue/Pink Collar	V. Craftsmen	Tech./Admin.	23.9	20.2	3.72 *
	VI. Operators, etc.	Tech./Admin.	24.0	20.5	3.37 *
Total (including unlisted categories)			23.3	20.0	3.32 *
F-ratios			4.34***	4.25***	

*F-ratio significant at P=0.10; **0.05; ***0.01.

*T-value from paired-comparison t-test significant at P=0.05.

Analysis of Variance for Difference in Travel Time:

(Scheffe's multiple-comparison test, at P=0.05)

Significant Differences between Groups

1 and 2, 1 and 4, 1 and 5

Data Source: U.S. Bureau of the Census (1992). Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

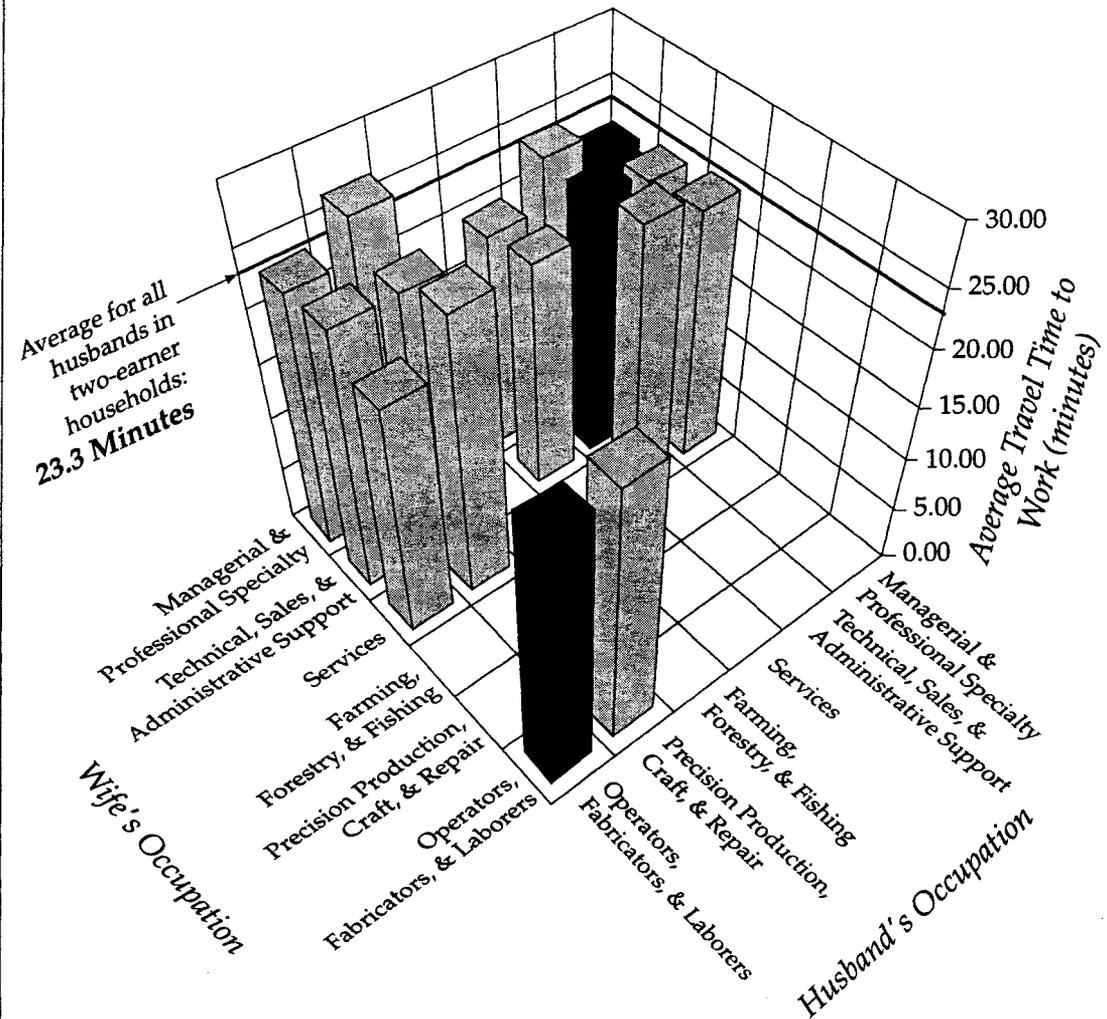
smallest (1.0 minutes) where both spouses hold high-status managerial and professional employment. This margin widens in all other categories, exceeding an average of three minutes in lower-middle class blue/pink-collar families, as well as in white/pink-collar households. The largest gap, at just over four minutes, appears in dual-technical families.

The prevalence of worktrip differences across all household types reveals important links between gender and the spatial dimensions of local labor markets. As a behavioral variable, occupational class highlights the interdependence between individual workers' characteristics and the geographical distribution of suitable job opportunities. Consider, for example, the spatial distribution of jobs for households in the dual-technical category. In Chapter 5, I showed that clerical employment is remarkably uniformly dispersed across the study area, a spatial structure which enables the short commutes of many suburban wives seeking to minimize the time and distance separating home and work. I also examined the high degree of centralization of public utilities, manufacturing plants, and the like, which often carve out distinct, "male-dominated" labor markets in well-defined districts scattered throughout the metropolitan region. Given the inclusion of both technical and clerical work in the same census occupational category, it is not surprising that the gender gap for dual-technical families exceeds that found in more affluent white/pink-collar households (Table 6.9).

On purely statistical grounds, occupational class correlates only moderately with observed commuting behavior. Nevertheless, striking divisions emerge between men and women engaged in distinct kinds of work. For husbands, occupational status bears little clear relation to the duration of the work journey. Husbands in low-status service occupations commute the shortest time (19.0 minutes), but most of those in blue-collar work commute longer than their counterparts in managerial and professional employment. Craftsmen married to wives in professional jobs have the longest average travel times (26.0 minutes), while managers and professionals report shorter commutes (21 - 23 minutes) (Figure 6.3).

For wives, occupational class plays a much more important role in the work journey. Wives employed in services and technical, sales, and administrative support occupations commute between 14 and 17 minutes, while the figures exceed

Total number of households: 226,360
 Sample Size: 8,039



Note: Only categories with samples of 100 or more households are shown.

©1995 Elvin K. Wylie

Figure 6.3. Average Work Journey of Husband, by Occupation of Husband and Wife. Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

Total number of households: 226,360
 Sample Size: 8,039

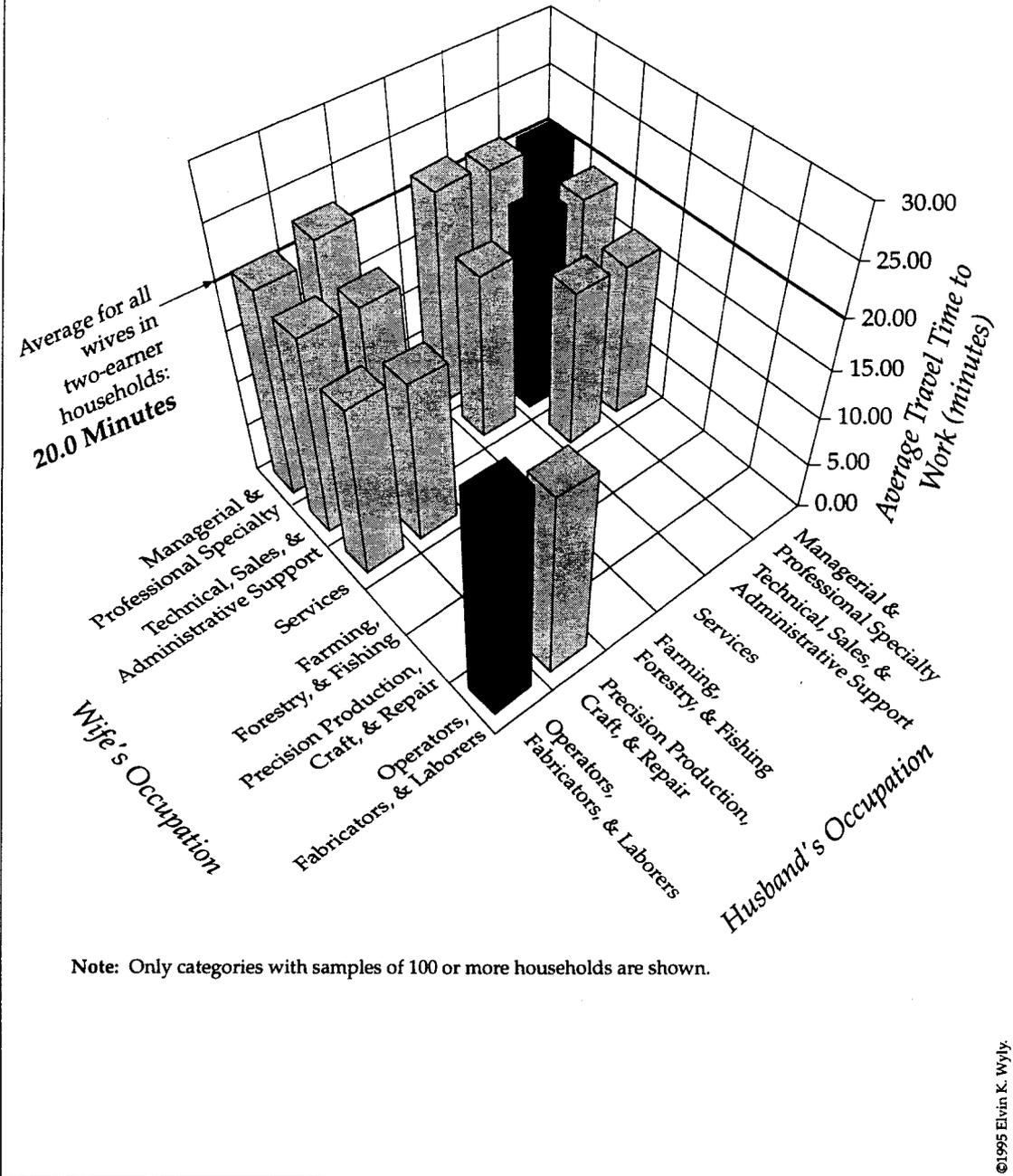


Figure 6.4. Average Work Journey of Wife, by Occupation of Husband and Wife. Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

22 minutes for those in managerial and professional employment (Figure 6.4). Disregarding the small number of wives holding male-dominated, blue-collar jobs, the overall pattern conveys an uninterrupted progression from low-status jobs with short work journeys, to higher-status, professional positions which support longer trips (Figure 6.4).

Income

There is no clear consensus on whether gender differences in the work journey apply most distinctly to lower- and middle-income households, or to more affluent families.¹⁹ If the gender gap diverges across distinct household income categories, then a) travel times should vary across income categories for both husbands and wives, and b) the gender gap should diverge across separate income levels.

The data support both of these expectations, but the gender gap persists across most of the income spectrum (Table 6.10). Although travel times covary with household income for both husbands and wives, the margin between the shortest and long commutes barely exceeds two minutes for workers of the same sex. The gap narrows in households earning more than \$90,000 annually, but exceeds three minutes in all other categories. The gap does not differ significantly between dual-earner families earning \$30,000 to \$60,000 and those in the \$60,000 to \$90,000 bracket, an indication that women's more localized commutes apply across most income levels.

Income disparities within the household, of course, play much more important roles in the choices and constraints facing individual workers. Women's greater reliance on lower-paying jobs, and their interrupted and part-time work careers exact substantial earnings penalties, and these effects are manifest in more localized labor markets. Wives in the dual-earner sample are disproportionately concentrated in lower-income categories, precisely inverse to the pattern of husbands' earnings (Table 6.11; Table 6.12). More than 83 percent of the wives earn less than \$30,000 annually, while more than three-fifths of the husbands garner

¹⁹There is mixed evidence on this question, in part because of racial differences in commuting patterns. For a concise review, see Johnston-Anumonowo, I., S. McLafferty, and V. Preston (1995). "Gender, race, and the spatial context of women's employment." In Garber, J.A. and R.S. Turner, eds., *Gender in Urban Research*. London: Sage, 236-55.

Table 6.10. Gender Gap in Work Journey by Household Income.

Household Income	N	Estimated No. of Households	Average Travel Time To Work		
			Husband	Wife	Difference
1 less than \$30,000	578	16,448	21.7	18.6	3.09 *
2 \$30,000 - \$59,999	4,165	116,882	23.5	19.6	3.86 *
3 \$60,000 - \$89,999	2,253	63,884	23.8	20.7	3.10 *
4 \$90,000 and over	1,005	28,029	22.2	20.5	1.68 *
Total	8,001	225,243	23.3	20.0	3.32 *
		F-ratios	6.10***	6.09***	

*F-ratio significant at P=0.10; **0.05; ***0.01.

*T-value from paired-comparison t-test significant at P=0.05.

Analysis of Variance for Difference in Travel Time:

(Scheffe's multiple-comparison test, at P=0.05)

Significant Differences between Groups

2 and 4

Data Source: U.S. Bureau of the Census (1992). Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

Table 6.11. Gender Gap in Work Journey by Husband's Income.

Husband's Income	N	Estimated No. of Households	Average Travel Time To Work		
			Husband	Wife	Difference
1 less than \$10,000	231	6,508	21.7	21.6	0.10
2 \$10,000 - \$19,999	939	27,101	21.7	20.2	1.55 *
3 \$20,000 - \$29,999	1,892	52,874	23.5	20.8	2.66 *
4 \$30,000 - \$39,999	2,065	57,841	23.8	19.8	4.03 *
5 \$40,000 and over	2,874	80,919	23.4	19.3	4.08 *
Total	8,001	225,243	23.3	20.0	3.32 *
F-ratios			4.78***	5.32***	

*F-ratio significant at P=0.10; **0.05; ***0.01.

*T-value from paired-comparison t-test significant at P=0.05.

Analysis of Variance for Difference in Travel Time:

(Scheffe's multiple-comparison test, at P=0.05)

Significant Differences between Groups

1 and 4, 1 and 5

2 and 4, 2 and 5

3 and 5

Data Source: U.S. Bureau of the Census (1992). Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

Table 6.12. Gender Gap in Work Journey by Wife's Income.

Wife's Income	N	Estimated No. of Households	Average Travel Time To Work		
			Husband	Wife	Difference
1 less than \$10,000	1,839	51,903	23.5	15.9	7.62 *
2 \$10,000 - \$19,999	2,740	75,808	23.0	19.7	3.30 *
3 \$20,000 - \$29,999	2,094	60,042	23.2	21.8	1.36 *
4 \$30,000 - \$39,999	826	23,380	24.0	23.5	0.52
5 \$40,000 and over	502	14,110	22.9	22.5	0.43
Total	8,001	225,243	23.3	20.0	3.32 *
F-ratios			1.24	85.3***	

*F-ratio significant at P=0.10; **0.05; ***0.01.

*T-value from paired-comparison t-test significant at P=0.05.

Analysis of Variance for Difference in Travel Time:
(Scheffe's multiple-comparison test, at P=0.05)

Significant Differences between Groups

1 and 2, 1 and 3, 1 and 4, 1 and 5

2 and 3, 2 and 4, 2 and 5

Data Source: U.S. Bureau of the Census (1992). Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

more than this amount. When arrayed against husband's incomes, the gender gap in worktrip length is significant across all categories except for those earning less than \$10,000. The gap is widest for those earning more than \$40,000 annually.

The wife's income exerts the opposite effect on the gender gap (Table 6.12). Women in higher-income categories report longer worktrips, and once their earnings exceed \$30,000 there is no significant gender difference in commuting. Fewer than one in five wives attain this income, however, so the vast majority of dual-earner families conform to the "conventional wisdom" relating women's more localized commutes to their reduced earnings.

Geographical Variation of Correlates of the Gender Gap

In the main, the behavioral correlates of women's shorter worktrips mirror the findings of similar studies, and provide few surprises. Yet the point I wish to make is that these connections are subject to variation at a fine spatial scale across the urban area, and that a comparatively short (or long) worktrip implies no single interpretation in all settings. As an initial examination of this hypothesis, I performed analysis of variance procedures for each of the fourteen sub-units of the study area, examining the main-effects contribution of each of the independent variables (Table 6.13). As with the TBI database, the dual-earner PUMS sample confirms the prevalence of significant differences in worktrip lengths throughout all parts of the study area. Yet the behavioral correlates of this gap are remarkably variable across the sub-units. Presence and age of children contribute significantly only in outlying, low-density areas, and signally fail to distinguish travel patterns in upper-middle class suburbs or within the central cities. Similarly, occupational class and household income differentiate among various levels of the gender gap in fewer than half of the sub-units of the study area. The most consistent and reliable discriminators of women's shorter worktrips are part-time employment and individual income, which yield significant F-ratios throughout the metropolitan area.

Modeling the Relations among Gender, Social Class, and Commuting Behavior

Given the fine spatial scale of local labor markets documented in Chapter 5, neither behavioral nor structural explanations of women's commuting can ignore mediating contextual factors. If local effects contribute to the gap between men's and women's worktrips, then (for example) the link between socioeconomic status and

Table 6.13. Gender Gap in Work Journey, Analysis of Variance Summary.

PUMA	N	Gender Gap in		F-Ratios from Analysis of Variance									
		Travel Time (minutes)	Presence/Age of Children	Husband's Work Hours	Wife's Work Hours	Occupational Class	Household Income	Husband's Income	Wife's Income				
1100	667	4.30 †	3.41 **	3.35 **	8.32 ***	0.50	1.86	3.59 ***	4.82 ***				
1200	427	4.48 †	1.64	1.59	3.68 **	1.06	0.90	2.21 *	3.96 ***				
1300	613	4.25 †	4.83 ***	2.19	14.78 ***	0.89	2.14 *	0.94	7.40 ***				
1400	739	3.45 †	5.25 ***	0.09	9.87 ***	1.85 *	2.21 *	2.46 **	6.15 ***				
1500	582	1.36 †	1.42	5.18 ***	3.38 **	2.52 **	2.90 **	1.07	2.77 **				
1600	435	2.03 †	1.20	0.09	0.52	0.58	1.06	2.36 *	4.22 ***				
1700	723	2.93 †	0.64	0.66	6.18 ***	2.31 **	2.20 *	2.00 *	4.57 ***				
1800	346	2.82 †	1.90	1.06	4.67 ***	2.43 **	0.66	0.84	3.05 **				
1900	449	2.60 †	1.89	0.41	5.98 ***	3.69 ***	1.58	0.81	3.34 **				
2000	604	3.21 †	2.83 **	2.13	8.45 ***	1.46	0.45	1.73	12.71 ***				
2100	485	2.55 †	1.72	0.08	4.82 ***	1.71	0.11	0.60	2.53 **				
2200	760	2.88 †	3.21 **	0.52	0.80	2.66 **	2.91 **	1.53	2.53 **				
2300	523	3.29 †	2.33 *	0.31	3.62 **	0.56	0.58	2.26 *	3.57 ***				
2400	648	5.58 †	2.14 *	1.26	6.89 ***	1.68	0.62	2.15 *	5.36 ***				
TCMA	8001	3.32 †	24.00 ***	3.45 **	70.90 ***	7.1 ***	5.58 ***	9.16 ***	55.67 ***				

†T-value from paired comparison t-test significant at P=0.01.

*F-ratio significant at P=0.10; **0.05; ***0.01.

Data Source: U.S. Bureau of the Census (1992). Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

commuting time will vary in magnitude and significance. These differences should persist after controlling for other intervening factors--family structure, part-time employment, and so forth. To assess the empirical validity of this hypothesis, I use linear structural relations (LISREL) methodology, which incorporates the analytical rigor of multiple-sample analysis and flexible parameter specifications while retaining many of the standard assumptions of the general linear model.

Exploratory Analysis and Model Development

Bivariate Correlations

Before examining the results of the final model of women's commuting, it is appropriate to review the main steps in model development. First, I undertook a detailed exploratory analysis of bivariate correlations among socioeconomic indicators for the fully-employed dual-earner sample. I included a total of twelve variables: at the household level, I focus on the presence and age of children and family income; for each spouse, I analyzed personal wage and salary income, educational attainment, occupational prestige, and commuting time. I examined correlation matrices for each of the fourteen sub-areas, as well as for the entire study area.

This analysis highlighted intriguing regularities in the relation between socioeconomic measures and commuting behavior. Across all portions of the study area, commuting times among husbands failed to correlate with any of the household or individual variables. For wives, commuting time is weakly--but *persistently*--linked to socioeconomic characteristics. Wives' worktrips lengthen at higher individual and household incomes, with higher education, and with more prestigious jobs. Although the salient relations are indeed subtle--respective indicators typically account for less than five percent of the variance in commuting time--the persistence of these links across all kinds of neighborhoods suggests that gender does play a role in mediating worktrip patterns in the workforce.

This finding is typically explained as the spatial expression of some form of aggregate 'household utility,' with husbands and wives jointly negotiating the division of paid and domestic labor in order to maximize family goals.²⁰ The sheer

²⁰These explanations exhibit remarkable parallels to the "cross-class" debate in sociology. See, for example, Goldthorpe, J. (1983). "Women and class analysis: In defense of the conventional view."

rigidity of the gender line, however, renders this line of reasoning tautological. It is nearly *always* the woman who bears the burden of housework, shopping, and child care, and who must balance these "gendered" tasks with (usually poorly-) paid employment. The household utility argument only begs the question, leading us into one of two dilemmas. On the one hand, accepting this explanation requires that we subscribe to a spatial variant of the 'myth of universal womanhood'--in other words, women do women's work because they are women, thereby producing empirically-observable differences in spatial behavior.²¹ While it is true that many occupations are intimately associated with service and servitude of a seemingly "feminized" nature, the designation of suitable "men's work" and "women's work" is in reality a contested struggle to define appropriate social roles.²² Thus the central question is not only how households balance the demands of child care and housework with those of paid employment, but also why women so often are steered into particular kinds of jobs, and how space and place mediate (and reflect) such processes.

On the other hand, the household utility thesis implies that families recognize the wage penalty confronting women workers--thereby undermining the neoclassical argument that labor markets are essentially neutral toward equally-productive groups of workers. Either way, to accept such utility-maximizing arguments *prima facie* when it is clear that wives' choices differ in fundamental ways from those of men, is to reify existing gender roles in urban theory.²³

I believe that the persistent link between socioeconomic variables and wives' commuting adds a gender dimension to the cumulative effects of decentralized growth on urban social space. For men, a half century of low-density residential expansion and aggressive highway planning has stretched the home-work link for a broad range of the middle class, particularly in bouyant midwestern settings such as the Twin Cities. Long worktrips are no longer the sole province of the stereotypical

Sociology 17, 465-88.

²¹For one of the earliest challenges to this logic, see Saegert, S. (1982). "Masculine cities and feminine suburbs: Polarized ideas, contradictory realities." In Stimpson, C.R., et al., eds., *Women and the American City*. Chicago: University of Chicago Press, 93-108.

²²See also Pratt, G., and S. Hanson (1993). "Women and work across the life course: Moving beyond essentialism." In Katz, C., and J. Monk, eds., *Full Circles: Geographies of Women Over the Life Course*. New York: Routledge, 27-54.

²³Acker, J. (1973). "Women and social stratification: A case of intellectual sexism." *American Journal of Sociology* 78, 936-45.

middle-class worker of conventional land-rent theory, nor of the affluent suburban commuter depicted in the critical urban research of the 1970s. In many areas the worktrips of blue-collar workers now equal or exceed those of white-collar professionals.²⁴

For women, however, enduring divisions in the labor market and within the family sustain close ties among socioeconomic status, social role, and the length of the daily commute. Many analysts interpret these connections in terms of women's "returns to commuting," whereby a positive correlation between wages and travel time denotes success in garnering higher earnings for longer trips.²⁵ Given the persistence of occupational sex segregation and the unequal division of labor in the family, however, a converse logic is much more compelling. For the vast majority of wives, formal employment remains an intensely localized affair, with time- and space-constraints limiting daily mobility and job-search networks. A comparatively small fraction of married women *do* undertake long commutes, and some do travel farther than their husbands; yet they must *justify* the cost and time spent away from home and family with a well-paying, secure, or rewarding job. With men still dominant in the most desirable segments of the labor market, few women gain entry into secure, well-paid jobs; but for those women who succeed, a comparatively long work journey may be necessary and justified.

LISREL Model Development

To disentangle the combined effects of these factors, I developed a series of "full" LISREL model specifications to analyze commuting times of husbands and wives in the fully-employed dual-earner PUMS sample.²⁶ In contrast to LISREL "submodels" (which are identical to conventional multiple regression and path-analytic techniques) the full specification incorporates latent construct measurement (via a confirmatory factor analysis) and simultaneously models structural relations among the constructs (yielding coefficients similar to those obtained in causal path analysis).²⁷ I developed several alternative models, each incorporating relations

²⁴Adams, J.S., M.J. Loughlin, and E.K. Wyly (1994). *Long-Distance Commuting in Minnesota*. Report No. 94-24. St. Paul, MN: Minnesota Department of Transportation.

²⁵Villeneuve, P., and D. Rose (1988). "Gender and the separation of employment from home in metropolitan Montreal, 1971-1981." *Urban Geography* 9, 155-79.

²⁶See the conceptual model of commuting time among married women, Figure 3.4, Chapter 3.

²⁷Jöreskog and Sörbom/SPSS, Inc. (1989). *LISREL 7: A Guide to the Program and Applications*. Chicago: SPSS, Inc.

among latent variables selected from among a total of seven constructs: household resources (measured by annual household income); and, separately for husbands and wives, socioeconomic status (income, education, occupational prestige); social role (weekly hours of employment, presence and age of children); and commuting behavior (one-way travel time to work).²⁸

The full LISREL models provided poor results, and several modifications failed to converge on reasonable values for the diagnostic measures. For most of these specifications the confirmatory factor analyses succeeded, with respective indicators (e.g., wives' earnings) loading on hypothesized latent constructs (e.g., wives' socioeconomic status). Yet the procedures faltered in the structural estimation, providing interpretable coefficients only after *post-hoc* freeing of error variance matrices.²⁹

Despite the recurrent failure of the full model specifications, this stage of the analysis provided further insight on the results of the exploratory analyses. Several alternative attempts to model simultaneously the travel times of husbands and wives failed; incorporating determinants of husbands' commuting time consistently increased model error, confirming the difficulty in relating men's socioeconomic characteristics to observed spatial behavior. Several additional difficulties in the full LISREL models stemmed from the measurement of two of the variables,³⁰ and from the areal aggregation of the dual-earner samples.³¹

²⁸For an example of one of the full LISREL models, see the path diagram of commuting among married women, Figure 3.5, Chapter 3.

²⁹In practice this approach differs little from poorly-fitting regression models, in that the parameter estimates may still support substantive interpretation even with a low coefficient of determination. The distinction between observed indicators and latent constructs in full LISREL specifications complicates this method, however. See Hayduk, L. (1987). *Structural Equation Modeling with LISREL: Essentials and Advances*. Baltimore: Johns Hopkins.

³⁰I describe the variable transformations performed on the data in Chapter 3. The occupational prestige score consistently yielded the most serious error, primarily because of the unique characteristics of this subjectively-measured indicator. While the GSS score ranges from less than 20 (for jobs such as news vendors and daily laborers) to nearly 90 (physicians) it fails to discriminate between male-dominated and female-dominated job categories. Despite considerable differences in job autonomy and compensation levels, reducing the multi-faceted construct of occupational class to a single index yields identical prestige scores for billing clerks and truck drivers (30); typists and auto mechanics (40); and bank tellers and plumbers (45). See footnote 13, Chapter 3.

³¹I calibrated full LISREL models for three separate tabulations of the fully-employed dual-earner sample: place of residence, place of husband's work, and place of wife's work. To keep the results tractable, therefore, I aggregated the 14 subunits of the study area into four broader units (see, e.g., Table 6.1).

The Final LISREL Model

Owing to the complex nature of the relations under investigation, I narrow the statistical analysis to focus on a smaller number of constructs. I calibrate a LISREL submodel corresponding to a simple causal path analysis, using two exogenous variables and four endogenous indicators to unravel the links among labor-market segmentation and married women's commuting (Figure 6.5).

I treat educational attainment and domestic responsibilities as exogenous and beyond the scope of the analysis, but I do investigate their role in occupational and industrial segmentation.³² ED is a dummy variable coded to 1 for wives with associate, professional, or academic degrees; CHILD is a dummy coded to 1 for all wives who have ever had children.

Three indicators measure labor-market circumstances. Occupational segregation is measured by OCC, a dummy coded to 1 for women employed in "typical" job categories, defined as those in which all women in the regional workforce are over-represented by more than one-third. Depending upon residential location, between one-third and one-half of all employed wives work as administrative support personnel, health assessers or technicians, teachers, or in service occupations (Table 6.14). Industrial segmentation is measured by IND, a dummy coded to 1 for women employed in professional services. Between one-half and two-thirds of all wives in the sample work in this sector (Table 6.14). WAGE denotes the estimated hourly wage calculated from annual wage and salary income in 1989, weeks worked in 1989, and usual hours worked per week. Wives' wages vary from an average of less than \$10 per hour in the southeast portion of the study area (PUMA 2400), to more than \$13 in the upper-middle class suburbs west of Minneapolis (PUMA 1700) (Table 6.14). Finally, TIME measures the self-reported, one-way travel time to work during the week prior to the census enumeration. Travel times for wives in this subsample range from an average of less than 17 minutes in St. Paul and the southeast suburbs (PUMAs 2100 and 2400, respectively), to more than 24 minutes on the northern fringe of the metropolitan area (PUMA 1300) (Table 6.14).

³²This restriction has the added advantage of eliminating the biased measurement of the work journey for mothers taking children to daycare on the way to work.

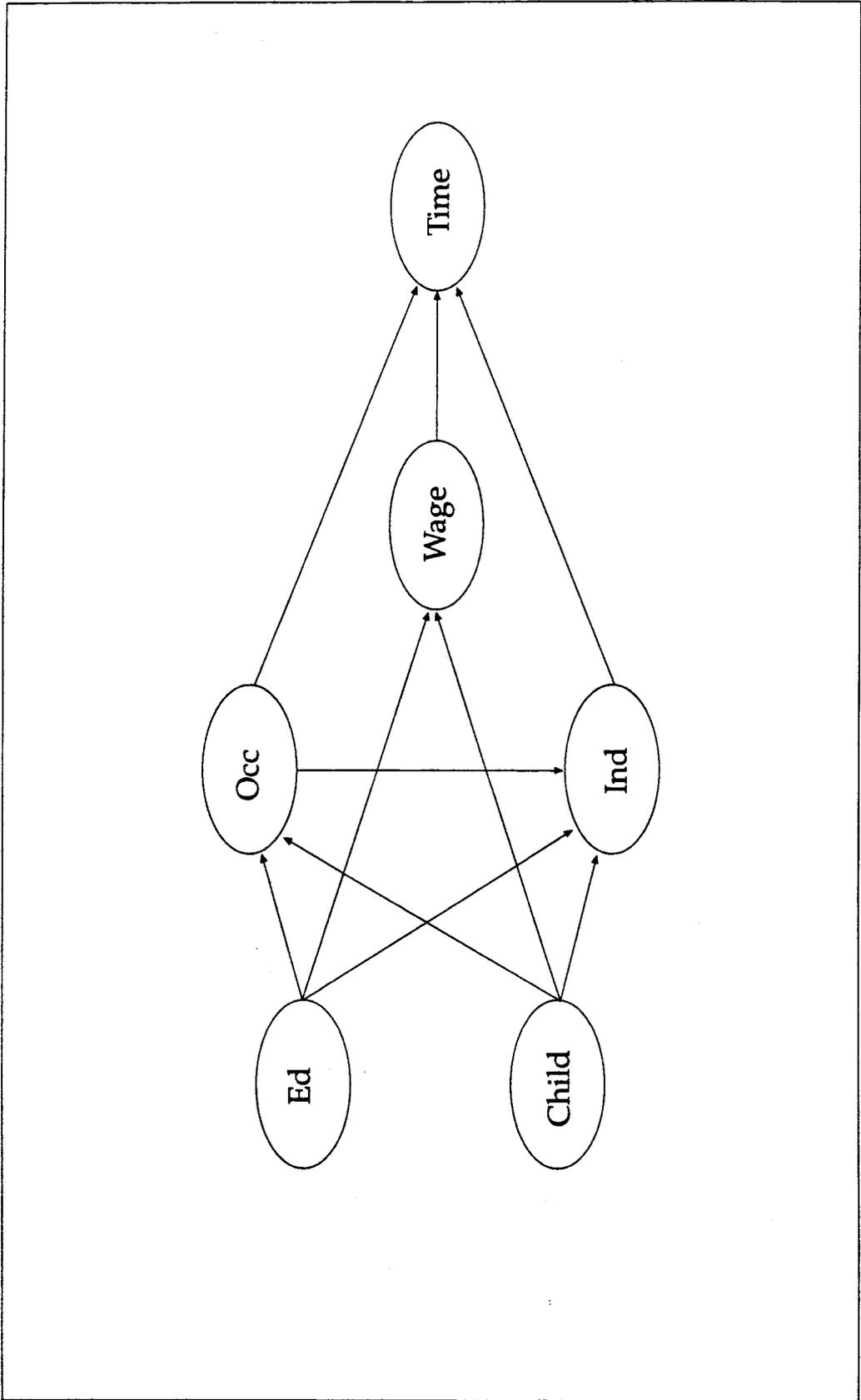


Figure 6.5. Path Diagram for Final Travel Time Model.

Table 6.14. Labor Market Variables and Commuting Times of Wives, by PUMA.

Areas	PUMA	Sample Size	Percent in		Est. Hourly		Travel Time	
			Typical Industries*	Typical Occupations**	Mean Earnings	Median Earnings	Mean to Work (min.)	Median to Work (min.)
Carver & Scott Counties	1100	498	63.3	32.3	\$10.16	\$8.81	21.0	20.0
Anoka	1200	351	61.3	44.4	10.19	9.13	19.7	20.0
Northern Anoka Co.	1300	484	59.7	34.5	10.60	9.60	24.4	25.0
Washington Co.	1400	578	63.0	39.4	11.38	10.05	21.0	20.0
Minneapolis	1500	414	54.3	48.6	11.77	10.10	17.3	15.0
Bloomington & Richfield	1600	360	60.3	43.3	12.27	9.29	17.2	15.0
Edina, Eden Prairie, & Plymouth	1700	593	51.6	38.1	13.39	10.58	18.5	15.0
Brooklyn Center	1800	282	64.5	33.3	11.80	9.65	20.7	20.0
Golden Valley & St. Louis Park	1900	348	58.6	39.9	11.28	9.62	17.2	15.0
Rem. Hennepin Co.	2000	484	56.4	35.1	12.81	9.61	22.2	20.0
St. Paul	2100	375	58.9	47.7	11.00	9.38	16.8	15.0
Northern Ramsey Co.	2200	604	62.9	43.9	12.66	10.40	17.6	15.0
Eagan & Apple Valley	2300	420	61.2	36.2	11.41	10.10	19.4	20.0
Suburban Dakota County	2400	496	66.3	38.5	9.96	8.73	16.9	15.0

Notes:

*Typical industries: professional services (SIC 811-894).

*Typical occupations: Health diagnosing & assessing (SIC 83-107); teachers (154-160); health technicians (202-209); administrative support (302-390); and services (403-407 and 433-469).

Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file.* [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

I calibrate two sets of models, the first estimating all parameters, and a second "best" estimate in which insignificant parameters are constrained to zero. I calibrate models for the entire fully-employed dual-earner sample (just under 6,300 wives) and for each of the 14 sub-areas of the seven-county region. To evaluate model validity--which measures the degree to which the hypothesized causal paths account for the pattern of covariances among observed variables--I use three statistics: χ^2 , the χ^2 /d.f. ratio, and the adjusted goodness-of-fit index (AGFI).³³ A structural coefficient of determination measures the collective proportion of variance accounted for in the path model. Given the linear specification of the model and the use of dummy variables, I confine my discussion and interpretations to the unstandardized parameter estimates, and I emphasize the significance (rather than the magnitude) of the parameters.

Metropolitan Model Results

The metropolitan model conforms to most of the hypothesized causal relations (Table 6.15). While the raw diagnostics imply a marginal fit--highly significant χ^2 values and χ^2 /d.f. ratios--adjusting the measures for the large sample size confirms the validity of the analysis.³⁴ While modest, the values of the structural coefficients of determination (0.13) appear reasonable in comparison with similar studies.

The model yields significant parameter estimates in all except two cases: interestingly, occupational sex segregation is not correlated with educational attainment, and childbirth (at least as measured here) has no clear effect on earnings. The parameter estimates imply a (linear) wage penalty of occupational sex segregation on the order of \$1.66, roughly one-six of the mean wage for all wives in

³³The most commonly-reported measure of model validity is χ^2 , which is large and significant when the discrepancies between the observed and model-implied matrices are too large to be the result of random sampling error. Since χ^2 is sensitive to sample size, however, I standardize it with the degrees of freedom, which (according to some analysts) reduces its sensitivity; χ^2 /d.f. ratios below 4 or 5 are normally judged to indicate well-fitting models. The adjusted goodness-of-fit index (AGFI) provides an alternative comparison of the model-implied and observed covariance matrices, while remaining independent of sample size and robust against deviations from multivariate normality. AGFI ranges from zero to 1, but well-fitting models typically yield values in the 0.80-0.95 range.

³⁴Hoelter and Hayduk have shown that the χ^2 statistic provides unreasonable estimates of model validity as sample sizes exceed 200. Their solution (calibrating the model at $n=200$) cannot be used to estimate parameter coefficients, since this invalidates t -values associated with the parameter estimates; but it *can* be used to gauge overall model validity. Setting $n=200$ for the metropolitan model yields a χ^2 of 1.56 ($P=0.816$), confirming that the hypothesized causal paths are consistent with the covariance of the observed data. See footnote 27, Chapter 3.

Table 6.15. Unstandardized Parameter Estimates,
Metropolitan Model.

Independent Variable	Ed		Child		Occ		Ind		Wage	
	Unconstrained	Constrained								
Dependent Variable										
Occ	-0.024	ns	0.052 *	0.057 *
Ind	0.317 *	0.317 *	0.083 *	0.083 *	0.311 *	0.311 *
Wage	3.992 *	3.905 *	0.495	ns	-1.065 *	-1.058 *	0.709 *	0.743 *
Time	-1.658 *	-1.658 *	0.778 *	0.778 *	0.063 *	0.063 *
<i>Model Fit</i>										
Structural R2	Unconstrained		Constrained							
	0.131		0.130							
Chi-square	44.1		49.3							
Prob > Chi-square	0.000		0.000							
AGFI	0.976		0.986							

Notes:

... Path not defined.

*Coefficient significant at P≤0.05.

ns Coefficient set to zero in constrained model.

Data Source: U.S. Bureau of the Census (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing, Five percent file.* [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.

the sample. Industrial segmentation boosts wages on the order of \$0.74, almost certainly reflecting the bifurcated occupational structure of the professional services sector. (Professional services encompass registered nurses, among the highest-paid segment of the female workforce, as well as poorly-paid clerical workers.)

PUMA Model Results

If local, contextual factors mediate observed differences in women's travel patterns, then the links among labor-market segmentation, earnings, and commuting time should vary across the metropolitan area. To evaluate this hypothesis, I calibrate models for each of the 14 Public-Use Microdata Areas (PUMAs) in the study area. In presenting the results of these models, I focus only on three salient relations: the role of childbirth on labor-market segmentation; the effect of segmentation on earnings; and the links between earnings, segmentation, and commuting time.

The PUMA models generally conform to the hypothesized causal relations, but the results imply considerable scale- and context-sensitivity. The model diagnostics vary widely, confirming the difficulty in accounting for variation in commuting patterns in any simple, linear fashion. Validity statistics range from highly robust (specifications in Minneapolis and St. Paul yield χ^2 values of 6.5 and 8.8, respectively) to those indicative of considerable deviations in Northern Anoka County and several of the south and west suburbs (Table 6.16).³⁵

The degree to which the hypothesized relations account for the variation in worktrips among married women is another matter. While the structural coefficients of determination generally mirror those obtained in similar studies, the values range widely across the metropolitan area. The model accounts for less than seven percent of the joint variance in the dependent variables in the first-ring suburbs northwest of Minneapolis (PUMA 1800), but 20 percent or more in St. Paul and several other areas (Table 6.16). In two of the sub-areas (St. Paul and the first-tier suburbs west of Minneapolis) none of the selected relations prove significant (Table 6.16). In two others (Minneapolis, and the suburbs south of the Minnesota River) the only significant links correspond to the effect of labor-market

³⁵The latter findings may stem from the large (500+) sample sizes. Nevertheless, even with sample sizes well in excess of the upper bound of the reliability of χ^2 eight of the models yield insignificant values on this measure—thus indicating a robust fit. In only one instance does the AGFI fall below 0.97.

segmentation on earnings. The model yields significant estimates for determinants of commuting time in only half of the sub-areas (Table 6.16).

Childbirth plays little or no role in labor-market segmentation, at least as measured in this binary fashion. The CHILD variable exerts significant effects on labor-market indicators in only a half-dozen cases (out of a possible 42) (Table 6.16). The distribution of these parameters suggests no clear interpretation. It is important to emphasize the limits of this variable, however. Interruptions in labor-force participation are clearly linked to occupational sex segregation in the years immediately following childbirth; but the effect does not persist when childbirth is measured as "ever had children."

As anticipated, labor-market segmentation exerts considerable effects on the earnings opportunities of married women in the labor force. Women's reliance on administrative support jobs exacts a sizeable wage penalty, yielding consistently negative parameter estimates for OCC. In no case does employment in a typical occupation augment wives' earnings. The parameters attain significant levels in four of the sub-areas, and in most cases the t-values denote "almost significant" negative parameter estimates.³⁶ Two of the PUMAS--northern Anoka County, and Eagan and Apple Valley--appear to exemplify particularly extreme cases of low-wage female labor in the suburbs: wives in typical job categories in these neighborhoods garner roughly \$2.00 less per hour than their counterparts in other occupations.

The link between earnings and industrial segmentation varies considerably by sub-area. Employment in professional services exerts negligible effects on the wages of most wives in the sample, but grants considerable premiums to those living on the northern fringe of the metropolitan area as well as those in the developing suburbs south of the Minnesota River. In northern Anoka County (PUMA 1300), this premium almost certainly stems from the growth in labor demand in the health-care industry. The northern part of the study area includes few well-paying opportunities for women outside the health services sector, and so employment in professional services boosts wages in comparison to low-wage clerical jobs. In Eagan and Apple Valley (PUMA 2300), the wage premium probably results from the recent completion of several bridges and highway links. Increased

³⁶Parameters with t-values exceeding 2.0 are normally judged to be significant at the 95% level; most of the OCC-WAGE parameters yield t-values in the 1.7 to 1.9 range.

accessibility has opened up large tracts to new development, and residents have short commutes to a wide range of jobs in downtown St. Paul and in along the Interstate corridors south of Minneapolis.

The WAGE-TIME coefficients signify positive returns to commuting only in five of the fourteen sub-areas (Table 6.16). Without exception, these areas follow a ring of diffuse, low-density settlement on the outskirts of the built-up area. Most of these subareas also include broad swaths of blue-collar and lower-middle class neighborhoods, although the coarse spatial sampling frame also includes some rapidly-growing affluent suburbs. In general, though, the results underscore considerable variation on the link between earnings and commuting time. With relatively few well-paying positions nearby, married women in low-density labor markets face a choice between low-wage employment nearby, or commuting longer to reach suitable opportunities in larger job concentrations in the developing suburbs or the central cities. For women in high-density labor markets with a large and diverse array of opportunities nearby, this choice fails to trace out clearly-observable spatial differences in the journey-to-work, yielding no significant link between earnings and commuting time.

These results are fairly encouraging. No single hypothesis regarding the links among labor-market segmentation, earnings, and commuting time prevails across all parts of the study area. In some instances, "conventional" wisdom on the role of occupational segregation and women's more localized commutes appears reasonable. In other cases, however, there is no clear relation between commuting time and socioeconomic variables, suggesting that local, contextual factors may determine whether segmentation assumes spatial form (as measured by commuting times). These findings support my central thesis: the empirical correlates of women's commuting patterns vary across the metropolis, and the scale- and context-dependency of these relations imply no consistent social interpretation of the length of the work journey.

These findings undermine any single urban thesis of the geographical dimensions of women's employment--whether spatial containment is viewed in behavioral or structural terms. Instead, the work journey provides a useful indicator of women's employment circumstances only in certain settings. In diffuse, lower-middle-class neighborhoods on the fringe of the built-up area,

occupational and industrial segmentation correlates with more localized commutes among married women. Those willing or able to undertake longer commutes to larger employment centers may be able to garner slightly higher earnings, thereby sustaining an aggregate correlation between earnings and travel time. Yet for the vast majority of wives in such settings, limiting the daily commute to balance paid and domestic work greatly constrains the range of available employment opportunities. In such lower-middle class neighborhoods the prevailing feminist interpretation of womens' shorter commutes--the spatial entrapment of women signifying oppression--appears justified.

The spatial entrapment thesis appears overly simplistic in many upper-middle class neighborhoods, and in suburbs in the shadow of large employment concentrations. In these settings, neither occupational nor industrial segmentation correlates with commuting time in any linear fashion. Rather, the wide range of job opportunities within a short commuting distance appears to conceal the spatial dimensions of gender differences in these local labor markets. Women's daily mobility and job-search networks in such neighborhoods may vary considerably from those of men; but the length of the work journey provides insufficient detail on the scale, timing, and direction of the salient spatial (and social) relations.

Conclusion

Taken in isolation, the length of the work journey is a notoriously poor indicator of social-equity considerations, and simplistic interpretations of commuting patterns invoke the most insidious forms of spatial fetishism. By itself, the length of the worktrip is neither utility-maximizing prestige, achieved through a rational trade-off of distance for space, nor oppression, whereby spatial factors perpetuate the exploitation of selected segments of the workforce. Half a century of metropolitan decentralization has loosened the ties between commuting patterns and workers' socioeconomic characteristics that prevailed in the stereotypical metropolis of the 1950s. The daily routine of the highway commute is now the norm for a broad segment of the class structure in the American city.

Yet it is not the magnitude of these differences, but their persistence, that sustains a growing body of research on the geography of women's employment. Women's commuting behavior reflects the observed spatial outcome of a complicated set of individual- and household-level considerations, and an enormous

body of knowledge points to deep gender divisions in how these considerations are manifest. What this analysis demonstrates is quite simple: contrary to dozens of attempts to construe the length of the work journey in simplistic, socio-spatial equity terms, the worktrip must be evaluated in relation to job quality, earnings, and a variety of other factors. It must also be studied at a relatively fine urban scale, in relation to the geographical distribution of employment opportunities.

CHAPTER SEVEN

CONCLUSIONS

In the short space of twenty years, social, economic, and intellectual trends have transformed the study of the journey to work. Two decades ago, urban transportation research was devoted to understanding spatial systems to inform the creation of the modern, efficient city with adequate capacity for the movement of commuters and commodities in the daily flows of the urban economy. Most analysts viewed gender issues with skepticism, and incorporated empirical findings of women's employment as incidental to the analysis of the "primary" (male) workforce.

Today, urban transportation research bears scant resemblance to its earlier counterpart. Transportation planners have replaced supply-side efforts with innovative attempts to manage travel demand and ensure individual mobility within the constraints of current infrastructure. Practitioners are now asked to perform a multiplicity of roles, from planning highways to negotiating among marginalized social groups. Within urban geography, work on the spatial dimensions of women's employment has evolved from obscure empiricist studies to include a much richer array of qualitative feminist interpretations of women's lived experiences in the city.

These transformations have greatly enriched urban research. Yet valuable insights of earlier traditions have been lost, and the persistence of methodological and substantive dichotomies continues to plague a fuller understanding. In this study I set out to explore the multifaceted geographical dimensions of women's employment, seeking to integrate some of the insights of gender research with those of classical urban spatial analysis. My attempt has been limited and partial, but I believe both perspectives add much to an understanding of the social and spatial complexity of work in the city.

Three findings stand out from my study. First, the familiar finding of gender differences in urban travel remains a persistent and durable feature of the social geography of the American city. Women work closer to home, even in "best-case" scenario with a buoyant regional economy and a long history of female labor force participation. On average, employed wives spend just over 20 minutes in the daily

journey to work, compared with 23 minutes for husbands. While it might appear hazardous to construct a large and growing body of research on a margin of three minutes, it is the persistence rather than the magnitude of this gap that motivates the search for the underlying relations between gender and urban commuting. Moreover, the gender gap is intimately related to enduring gender roles at both ends of the work journey. My results also show that this gender gap is associated with remarkably fine-grained tears in the urban fabric: not only do women spend less time in the worktrip, they also work in different places in the city.

My second major finding is that the gender gap in worktrip length varies widely from one part of the city to another. To most geographers this finding is no surprise, but it provides a reminder of the contextual importance of the spatial structure of opportunities rooted in the distribution of different kinds of jobs and housing. This result also underscores the contingent relation of gender divisions to observable spatial patterns. My findings indicate substantial variation in the links among urban commuting, gender, and socioeconomic characteristics. Among dual-earner families in upscale neighborhoods near large and diverse job centers, for example, considerable gender disparities in earnings persist without substantial differences in the work journey. In diffuse, working-class labor markets, by contrast, surveying husbands and wives at their workplace is likely to reveal large gender gaps in work travel along with earnings disparities. Clearly, this contextual variation has far-reaching methodological implications for attempts to infer causal process from observable spatial patterns.

Finally, my study provides strong support for some of the theoretical arguments of feminist geographers Susan Hanson and Geraldine Pratt. The fine-grained geographical patterns traced out by the division of labor in the metropolitan economy are partitioned deeply along gender lines. In line with classical theories, status distinctions among men employed in different lines of work exhibit close ties to the geography of residential neighborhoods. Occupational and industrial segmentation remains a reasonably accurate discriminator of urban residential space, dividing "production" from "service" realms and distinguishing "blue-collar" from "white-collar" neighborhoods. For women, however, conventional labor-force classifications effectively conceal socioeconomic variations. Given the fact of persistent gender divisions in the workforce, occupational and industrial segmentation provide a poor mirror of the city's social space. Thus women from all

parts of the city share similar positions in terms of workplace-based occupational class, binding together women from working-class suburbs and those living in upscale residential enclaves. This finding implies some degree of class heterogeneity in neighborhoods that appear homogeneous in terms of male social class. The striking divisions observed in these patterns also force us to question the gender-specific assumptions embedded in our ideas of social class, and imply that the geographies of these social relations are fundamentally gendered.

BIBLIOGRAPHY

- ABBOTT, P., AND R. SAPSFORD (1987). *Women and Social Class*. London: Tavistock.
- ACKER, J. (1973). "Women and social stratification: A case of intellectual sexism." *American Journal of Sociology* 78, 936-45.
- ADAMS, J.S. (1970). "Residential structure of midwestern cities." *Annals of the Association of American Geographers* 60(1), 37-62.
- ADAMS, J.S. (1991). "Housing submarkets in an American metropolis." In Hart, J.F., ed., *Our Changing Cities*. Baltimore: Johns Hopkins University Press, 108-26.
- ADAMS, J.S., AND B. VANDRASEK (1993). *Minneapolis-St. Paul: People, Place, and Public Life*. Minneapolis: University of Minnesota Press.
- ADAMS, J.S., M.J. LOUGHLIN, AND E.K. WYLY (1994). *Long-Distance Commuting in Minnesota*. [Report No. 94-24.] St. Paul, MN: Minnesota Department of Transportation.
- ALONSO, W. (1965). *Location and Land Use*. Cambridge, MA: Harvard University Press.
- BAERWALD, T.J. (1978). "The emergence of a new 'downtown.'" *Geographical Review* 68(3), 308-18.
- BERG, I. (1981). *Sociological Perspectives on Labor Markets*. New York: Academic Press.
- BERRY, B.J.L., AND F.E. HORTON, EDS. (1970). *Geographic Perspectives on Urban Systems*. Englewood Cliffs, NJ: Prentice-Hall.
- BLUMEN, O. (1994). "Gender differences in the journey to work." *Urban Geography* 15(3), 223-45.
- BOLLENS, J.C., AND H.J. SCHMANDT (1965). *The Metropolis*. New York: Harper & Row.
- BONDI, L. (1992). "Gender and dichotomy." *Progress in Human Geography* 16(2), 157-70.
- BORCHERT, J.R. (1987). *America's Northern Heartland: An Economic and Historical Geography of the Upper Midwest*. Minneapolis: University of Minnesota Press.
- BROOKER-GROSS, S.R., AND T.A. MARAFFA (1985). "Commuting distance and gender among non-metropolitan university employees." *Professional Geographer* 37, 303-09.
- CARMINES, E., AND J. MCIVER (1981). "Analyzing models with unobserved variables: Analysis of covariance structures." In Borhnstedt, G., and E. Borgatta, eds., *Social Measurement: Current Issues*. Beverly Hills, CA: Sage.
- CHAPIN, F.S., JR. (1974). *Human Activity Patterns in the City*. New York: John Wiley & Sons.
- CLARK, G. (1981). "The employment relation and spatial division of labor: A hypothesis." *Annals of the Association of American Geographers* 71(3), 412-24.
- COOKE, P. (1984). *Localities: The Changing Face of Urban Britain*. London: Unwin Hyman.

- COWAN, R.S. (1983). *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave*. New York: Basic Books.
- CURRAN, C., C.A. CARLSON, AND D.A. FORD (1982). "A theory of residential location decisions of two-earner households." *Journal of Urban Economics* 12, 102-14.
- DAVIES, M.W. (1982). *Woman's Place is at the Typewriter: Office Work and Office Workers, 1870-1930*. Philadelphia: Temple University Press.
- DAVIS, J.A., AND T.W. SMITH (1991). *General Social Surveys, 1972-1991: Cumulative Guidebook*. Chicago: National Opinion Research Center.
- DOERINGER, P., AND M. PIORE (1971). *Internal Labor Markets and Manpower Analysis*. Lexington, MA: D.C. Heath.
- DEAR, M., AND A. SCOTT, EDS. (1981). *Urbanization and Urban Planning in Capitalist Society*. New York: Methuen.
- ENGLAND, K.V.L. (1993). "Suburban pink-collar ghettos: The spatial entrapment of women?" *Annals of the Association of American Geographers* 83(2), 225-42.
- ENGLAND, K.V.L. (1994). "Reply to Susan Hanson and Geraldine Pratt." *Annals of the Association of American Geographers* 84(3), 502-04.
- ENGLAND, P. (1981). "Assessing trends in occupational sex segregation, 1970-1976." In Berg, I., ed., *Sociological Perspectives on Labor Markets*. New York: Academic Press, 273-95.
- EVANS, S.M., AND B.J. NELSON (1989). *Wage Justice: Comparable Worth and the Paradox of Technocratic Reform*. Chicago: University of Chicago Press.
- FAUE, E. (1991). *Community of Suffering and Struggle: Women, Men, and the Labor Movement in Minneapolis, 1910-1940*. Chapel Hill: University of North Carolina Press.
- FELDMAN, M. (1977). "A contribution to the critique of urban political economy: The journey to work." *Antipode* 9, 30-50.
- FERGUSON, E. (1994). "Recent advances in urban transportation planning methods, models, and research techniques." *Journal of Planning Education and Research* 13, 185-88.
- FITZSIMMONS, J.D. (1991). *Female Labor Force Participation Change in the Central United States, 1950-1980*. Unpublished Ph.D. Thesis. Minneapolis: University of Minnesota.
- FRASER, J.A. (1986). *The Best U.S. Cities for Working Women*. New York: New American Library.
- GELBACH, D.L. (1985). "No more lonely fights." *Minnesota Business Journal*. November, 26-35.
- GOLDTHORPE, J. (1983). "Women and class analysis: In defense of the conventional view." *Sociology* 17, 465-88.
- GORDON, D., R. EDWARDS, AND M. REICH (1982). *Segmented Work, Divided Workers: The Historical Transformation of Labor in the U.S.* Cambridge: Cambridge University Press.
- GREENWALD, M. (1980). *Women, War, and Work*. Westport, CT: Greenwood Press.

- HANSON, S., ED. (1986). *The Geography of Urban Transportation*. New York: Guilford Press.
- HANSON, S., ED. (1995). *The Geography of Urban Transportation*. Second edition, forthcoming. New York: Guilford Press.
- HANSON, S., AND I. JOHNSTON (1985). "Gender differences in worktrip length: Explanations and implications." *Urban Geography* 6, 193-219.
- HANSON, S., AND G. PRATT (1988). "Reconceptualizing the links between home and work in urban geography." *Economic Geography* 64, 299-321.
- HANSON, S., AND G. PRATT (1988). "Spatial dimensions of the gender division of labor in a local labor market." *Urban Geography* 9, 180-202.
- HANSON, S., AND G. PRATT (1991). "Job search and the occupational segregation of women." *Annals of the Association of American Geographers* 81(2), 229-53.
- HANSON, S., AND G. PRATT (1992). "Dynamic dependencies: A geographic investigation of local labor markets." *Economic Geography* 68, 373-405.
- HANSON, S., AND G. PRATT (1994). "On suburban pink collar ghettos: The spatial entrapment of women? by Kim England." *Annals of the Association of American Geographers* 84(3), 500-02.
- HANSON, S., AND G. PRATT (1995). *Gender, Work and Space*. New York: Routledge.
- HARRIS, R. (1984). "Residential segregation and class formation in the capitalist city: A review and directions for research." *Progress in Human Geography* 18, 26-49.
- HART, J.F., ED. (1991). *Our Changing Cities*. Baltimore: Johns Hopkins University Press.
- HARTMANN, S. (1982). *The Home Front and Beyond: American Women in the 1940s*. Boston: G.K. Hall.
- HARTSHORNE, R. (1932). "The Twin City district: A unique form of urban landscape." *Geographical Review* 22(3), 431-42.
- HARVEY, D. (1973). *Social Justice and the City*. London: Edward Arnold.
- HARVEY, D. (1985). *The Urbanization of Capital*. Oxford: Basil Blackwell.
- HAYDEN, D. (1984). *Redesigning the American Dream*. New York: W.W. Norton.
- HAYDUK, L.A. (1987). *Structural Equation Modeling with LISREL: Essentials and Advances*. Baltimore, MD: Johns Hopkins.
- HIGLEY, M. (1919). *Women in Banking in the City of Minneapolis*. Minneapolis: Women's Occupational Bureau.
- HODGE, D.C. (1990). "Geography and the political economy of urban transportation." *Urban Geography* 11(1), 87-100.
- HOELTER, J.W. (1983). "The analysis of covariance structures: Goodness-of-fit indices." *Sociological Methods and Research* 11, 325-44.

- HOOVER, E., AND R. VERNON (1959). *Anatomy of a Metropolis*. New York: Doubleday.
- HORWOOD, E., AND R. BOYCE (1959). *Studies of the Central Business District and Urban Freeway Development*. Seattle: University of Washington.
- HOYT, H. (1939). *Structure and Growth of Residential Neighborhoods in American Cities*. Washington, D.C.: Federal Housing Administration.
- JOHNSTON-ANOMONOWO, I., S. MCLAFFERTY, AND V. PRESTON (1995). "Gender, race, and the spatial context of women's employment." In Garber, J.A., and R.S. Turner, eds., *Gender in Urban Research*. London: Sage, 236-55.
- JÖRESKOG, K.G. (1970). "A general method for analysis of covariance structures." *Biometrics* 57, 239-57.
- JÖRESKOG, K.G. (1973). "A general method for estimating a linear structural equations system." In Goldberger, A.S., and O.D. Duncan, eds., *Structural Equation Models in the Social Sciences*. New York: Academic Press, 85-112.
- JÖRESKOG AND SÖRBOM/SPSS, INC. (1989). *Lisrel 7: A Guide to the Program and Applications*. Chicago: SPSS, Inc.
- KAIN, J.F. (1968). "Housing segregation, negro employment, and metropolitan decentralization." *Quarterly Journal of Economics* 82, 175-97.
- KOMOTO, C.T. (1994). *Intraurban Migration in the Minneapolis-St. Paul Metropolitan Area*. Unpublished Ph.D. Thesis. Minneapolis: University of Minnesota.
- LEIPMANN, K.K. (1945). *The Journey to Work*. London: Kegan Trench and Truber and Co.
- LEY, D. (1983). *A Social Geography of the City*. New York: Harper & Row.
- MADDEN, J.F. (1981). "Why women work close to home." *Urban Studies* 18, 181-94.
- MADDEN, J.F., AND L. CHIEN CHIU (1990). "The wage effects of residential location and commuting constraints on employed married women." *Urban Studies* 27, 253-69.
- MADDEN, J.F., AND M.J. WHITE (1980). "Spatial implications of increases in the female labor force: A theoretical and empirical synthesis." *Land Economics* 56, 432-46.
- MANNING, I. (1978). *The Journey to Work*. Boston: Allen and Unwin.
- MARAFFA, T.A., AND S.R. BROOKER-GROSS (1984). "Aspects of the journey-to-work within a small city laborshed." *Urban Geography* 5, 178-86.
- MARKUSEN, A.R. (1981). "City spatial structure, women's household work, and national urban policy." In Stimpson, C.R., et al., eds., *Women and the American City*. Chicago: University of Chicago Press, 20-41.
- MASSEY, D. (1984). *Spatial Divisions of Labor*. London: Methuen.
- MCLAFFERTY, S., AND V. PRESTON (1991). "Gender, race, and commuting among service-sector workers." *Professional Geographer* 43, 1-15.

- MCLAFFERTY, S., AND V. PRESTON (1992). "Spatial mismatch and labor market segmentation for African-American and Latina women." *Economic Geography* 68, 406-31.
- METROPOLITAN COUNCIL (1992). *1990 Travel Behavior Inventory*. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.
- METROPOLITAN COUNCIL (1992). *Home Interview Survey, 1990 Travel Behavior Inventory*. [Machine-readable data file.] St. Paul, MN: Metropolitan Council.
- METROPOLITAN COUNCIL (1992). *Home Interview Survey, Methodology and Results*. [Technical documentation.] St. Paul, MN: Metropolitan Council.
- METROPOLITAN COUNCIL (1992). *Trouble at the Core*. St. Paul, MN: Metropolitan Council.
- MUTH, R.F. (1969). *Cities and Housing*. Chicago: University of Chicago Press.
- NELSON, K. (1986). "Labor demand, labor supply, and the suburbanization of low-wage office work." In Scott, A.J., and M. Storper, eds., *Production, Work, Territory*. Boston: Allen and Unwin, 149-71.
- PEET, R. (1984). "Class struggle, the relocation of employment, and economic crisis." *Science and Society* 48(1), 38-51.
- PRATT, E.E. (1911). *Industrial Causes of Congestion of Population in New York City*. New York: AMJ Press. cited in Madden, J.F. (1981). "Why women work close to home." *Urban Studies* 18, 181-94.
- PRATT, G., AND S. HANSON (1988). "Gender, class, and space." *Environment and Planning D: Society and Space* 6, 15-35.
- PRATT, G., AND S. HANSON (1993). "Women and work across the life course: Moving beyond essentialism." In Katz, C., and J. Monk, eds., *Full Circles: Geographies of Women over the Life Course*. New York: Routledge, 27-54.
- PRATT, G., AND S. HANSON (1994). "Geography and the construction of difference." *Gender, Place and Culture* 1(1), 5-29.
- PRESTWICH, R. (1968). *The Manufacturing Industry of the Twin Cities: Changes in Locational Emphases, 1946-1967*. Unpublished M.A. Thesis. Minneapolis: University of Minnesota.
- REES, P.H. (1970). "The factorial ecology of metropolitan Chicago." In Berry, B.J.L., and F.E. Horton, eds., *Geographic Perspectives on Urban Systems*. Englewood Cliffs, NJ: Prentice-Hall.
- RESKIN, B., AND H. HARTMANN (1986). *Men's Work, Women's Work: Sex Segregation on the Job*. Washington, D.C.: National Academy Press.
- ROSE, G. (1993). *Feminism and Geography*. Minneapolis: University of Minnesota Press.
- RUTHERFORD, B.M., AND G.R. WEKERLE (1988). "Captive rider, captive labor: Spatial constraints and women's employment." *Urban Geography* 9, 116-37.
- SAS INSTITUTE, INC. (1988). *SAS User's Guide: Statistics*. Version 5 edition. Cary, NC: SAS Institute, Inc.

- SAEGERT, S. (1981). "Masculine cities and feminine suburbs: Polarized ideas, contrasting realities." In Stimpson, C.R., et al., eds., *Women and the American City*. Chicago: University of Chicago Press, 93-108.
- SCOTT, A.J. (1986). "Industrialization and urbanization: A geographical agenda." *Annals of the Association of American Geographers* 76, 25-37.
- SCOTT, A.J. (1988). *Metropolis: From the Division of Labor to Urban Form*. Berkeley: University of California Press.
- SCOTT, A.J., AND M. STORPER, EDS. (1986). *Production, Work, Territory*. Boston: Allen and Unwin.
- SHEVKY, E., AND W. BELL (1955). *Social Area Analysis*. Stanford: Stanford University Press.
- SINGELL, L.D., AND J.H. LILLYDAHL (1986). "An empirical analysis of the commute to work patterns of males and females in two-earner households." *Urban Studies* 2, 119-29.
- STEVENS, G., AND J.H. CHO (1985). "Socioeconomic indexes and the new 1980 census occupational classification scheme." *Social Science Research* 14, 142-68.
- STIMPSON, C.R., ET AL. (1981). *Women and the American City*. Chicago: University of Chicago Press.
- STORPER, M., AND R. WALKER (1989). *The Capitalist Imperative: Territory, Technology, and Industrial Growth*. New York: Basil Blackwell.
- TIMMS, D. (1971). *The Urban Mosaic*. London: Cambridge University Press.
- U.S. BUREAU OF THE CENSUS (1952). *1950 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul*. Washington, D.C.: U.S. Government Printing Office.
- U.S. BUREAU OF THE CENSUS (1962). *1960 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul*. Washington, D.C.: U.S. Government Printing Office.
- U.S. BUREAU OF THE CENSUS (1972). *1970 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul*. Washington, D.C.: U.S. Government Printing Office.
- U.S. BUREAU OF THE CENSUS (1983). *1980 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul*. Washington, D.C.: U.S. Government Printing Office.
- U.S. BUREAU OF THE CENSUS (1991). *State and Metropolitan Area Data Book 1991*. Washington, D.C.: U.S. Government Printing Office.
- U.S. BUREAU OF THE CENSUS (1992). *1990 Census of Population and Housing, Census Tract Statistics, Minneapolis-St. Paul*. Washington, D.C.: U.S. Government Printing Office.
- U.S. BUREAU OF THE CENSUS (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing*. Five percent sample. [Machine-readable data file.] Washington, D.C.: U.S. Government Printint Office.
- U.S. BUREAU OF THE CENSUS (1992). *Public-Use Microdata Sample, 1990 Census of Population and Housing*. [Technical documentation.] Washington, D.C.: U.S. Government Printint Office.

- U.S. BUREAU OF THE CENSUS (1994). *1990 Census Transportation Planning Package, Urban Element*. [Technical documentation for summary tape.] Washington, D.C.: U.S. Government Printing Office.
- U.S. BUREAU OF THE CENSUS (1994). *Census Transportation Planning Package, 1990 Census of Population and Housing, Minneapolis-St. Paul Metropolitan Statistical Area*. [Machine-readable data file.] Washington, D.C.: U.S. Government Printing Office.
- U.S. BUREAU OF THE CENSUS (1994). *City and County Data Book 1994*. Washington, D.C.: U.S. Government Printing Office.
- VILLENEUVE, P., AND D. ROSE (1988). "Gender and the separation of employment from home in metropolitan Montreal." *Urban Geography* 9, 155-79.
- WALBY, S. (1986). *Patriarchy at Work*. Minneapolis: University of Minnesota Press.
- WALBY, S. (1990). *Theorizing Patriarchy*. Cambridge, MA: Basil Blackwell.
- WALKER, R.A. (1981). "A theory of suburbanization: Capitalism and the construction of urban space in the United States." In Dear, M., and A. Scott, eds., *Urbanization and Urban Planning in Capitalist Society*. New York: Methuen, 383-429.
- WEKERLE, G.R., AND B. RUTHERFORD (1989). "The mobility of capital and the immobility of female labor: Responses to economic restructuring." In Wolch, J., and M. Dear, eds., *The Power of Geography: How Territory Shapes Social Life*. Winchester, MA: Unwin Hyman, 139-72.
- WHEATON, B., B. MUTHEN, D. ALWIN, AND G. SUMMERS (1977). "Assessing reliability and stability in panel models." In Heise, D., ed., *Sociological Methodology 1977*. San Francisco: Jossey-Bass, 84-136.
- WHEELER, J.O. (1967). "Occupational status and work-trips: A minimum distance approach." *Social Forces* 45, 508-15.
- WRIGHT, E.O. (1987). "Women and the class structure." *Politics and Society* 17(1), 35-66.
- WYLY, E.K. (1995). "Gender differences in urban travel." Paper presented at the Sixth annual Transportation Research Conference of the Center for Transportation Studies. Minneapolis: University of Minnesota.

