

Employers as Mediating Institutions for Public Policy: The Case of Commute Options Programs

Leisha DeHart-Davis*
Assistant Professor
Department of Public Administration
University of Kansas

Randall Guensler
Associate Professor
School of Civil and Environmental Engineering
Georgia Institute of Technology

**Corresponding Author:
University of Kansas
Department of Public Administration
1541 Lilac Lane, #318
Lawrence, KS 66045-3177
E-Mail: lldavis@ku.edu
Phone: 785-864-9022

Abstract

Scholars have recently noted the role that employers can play as “mediating institutions” for public policy. Mediating institutions connect the private lives of individuals with public policy concerns by communicating societal norms to members and providing social contexts that encourage a commitment to these norms. Despite the potential importance of employers as mediating institutions for public policy, little scholarly attention has been devoted to employer mediation behavior. Accordingly, this study examines two research questions. What factors influence an employer’s willingness to mediate policy problems? And how effective are employers as mediating institutions? The mediation behaviors of interest relate to employer efforts to mitigate traffic congestion and air quality problems by enabling employee “commute options,” which are alternatives to single-occupancy vehicle commuting to work. Drawing on theories of organization behavior, the study hypothesizes that self-interest, organizational control, and association membership will affect willingness to provide commute options. The study also hypothesizes that employers providing commute options will have lower percentages of employees that drive to work alone. Both sets of hypotheses are supported by statistical analyses of data from a cross-sectional mail survey of metropolitan Atlanta organizations.

Keywords: mediating institutions, organization behavior, transportation policy

Introduction

Scholars have recently noted the role that employers can play as “mediating institutions” for public policy (Henry and Gordon, 2003; Madden, 1980). Mediating institutions connect the private lives of individuals with public policy concerns by communicating societal norms to members and providing social contexts that encourage a commitment to these norms (Berger and Neuhaus, 1977). Family, neighborhoods, religious institutions, and voluntary associations are viewed as the traditional mediating institutions. However, significant increases in the percentage of time that people spend at work, combined with declines in the time devoted to traditional mediating institutions, have led employers to play an increasingly important role as mediating institutions (Fort, 1996).

In addition to serving as the focal point for peoples’ lives, employers are logical mediating institutions for public policy because they provide centralized access to individuals that may be targeted by policymakers for behavioral change (Weiss and Tschirhart, 1994). Employers, particularly large ones, can invest resources in helping to solve or mitigate the effects of social problems that affect their self-interest (Madden, 1980, p. 113). Finally, employers provide the social contexts in which behavior can be sanctioned or discouraged, another important function of mediating institutions for public policy concerns (Berger and Neuhaus, 1977). These features are particularly pertinent given the diminishing role of direct government intervention for addressing policy problems (Frederickson and Smith, 2003, p. 207).

Despite the potential importance of employers to achieving public policy goals, little attention has been devoted to studying employers as voluntary mediating institutions.¹ Accordingly, this study examines two research questions. First, what organizational characteristics influence an employer’s willingness to serve as a mediating institution? This

information is particularly valuable for policy managers responsible for recruiting such participation. The second research question addresses the relationship between employer mediation and desired policy outcomes. In particular, how effective are employers as mediating institutions? While policy scholars are beginning to recognize employers as mediating institutions, little research effort has been devoted to quantifying their results. This study takes a step in that direction.

The employer mediation behavior of interest in this study pertains to traffic congestion and air quality. These twin problems plague metropolitan areas with large populations, sizable vehicle fleets, and extensive suburbanization which, in turn, have led to significant increases in per-capita vehicle travel. Employers can serve as policy mediators for these issues by promoting “commute options” programs to their employees. Commute options programs include the provision of work modes that allow employees to avoid commuting during rush-hour traffic and organizational incentives designed to discourage employees from driving to work alone. Using data from a cross-sectional mail survey of metropolitan Atlanta organizations, this study examines the organizational characteristics associated with the availability to employees of commute-options work modes, as well as the effects of certain policy mediation activities on the percentage of employees that drive to work alone.

The paper begins with a discussion of the literature on mediating institutions. The second section describes traffic congestion and air quality as intertwined policy problems ripe for employer policy mediation. Section three presents hypotheses on three organizational attributes thought to influence the availability of commute options to employees. The fourth section describes data collection, while the fifth profiles the measures and models used to test the study

hypotheses. Section six profiles the model results. Discussion and conclusion sections finalize the paper.

Mediating Institutions for Public Policy

Berger and Neuhaus were the first scholars to examine the role of mediating institutions in public policy (1977). Focusing on families, neighborhoods, churches, and voluntary associations, the authors contend that public policies should strengthen and utilize these mediating structures as a way to empower citizens to play a greater role in public policy and, subsequently, make them feel less alienated from government. For example, the federal government could return tax dollars to neighborhoods, who as a community would decide how they would be spent; families could be allowed to choose their children's schools through tuition vouchers; churches could receive government funding to administer social services (this before the advent of Bush's faith-based funding); and voluntary associations could serve as public policy implementers, as occurred in 1975 when 100,000 Vietnamese refugees were resettled by nonprofit organizations. Berger and Neuhaus view corporations as a one of the "megastructures" that included government and organized labor from which most individuals felt alienated. By contrast, the smaller size of families, neighborhoods, churches and voluntary corporations create more intimate spaces for their members to experience the consequences of their actions and thus develop moral character and a sense of citizenship.²

Madden argues that Berger and Neuhaus were wrong to exclude corporations as mediating institutions for public policy concerns (1980). As do other mediating institutions, he asserts, corporations provide meaning and identity to employees. From a public policy perspective, the corporation's societal location, between individual stakeholders and the government, provides the opportunity to work for the betterment of these stakeholder (e.g.,

employees, shareholders and customers). This form of mediation can involve, for example, lobbying for laws that protect employees or suppliers or lending bulldozers to local authorities for clean up after a tornado. In contrast with Berger and Neuhaus, corporations are less an incubator for individual moral development and more a facilitator of societal good through the improvement of stakeholder lives. Thus organization size is a plus, potentially providing a larger well of financial resources from which to draw for investing in mediation activities.

Fort agrees that businesses are mediating structures (1996, 1997, 2001), but for reasons different than those of Madden's. According to Fort, the time people spend at work has displaced the time they spend participating in other mediating structures (family, neighborhood groups, churches, voluntary associations, etc.). Fort is concerned with ethical corporate behavior, which he argues can be achieved (among other approaches) through employee representation in decision-making, expansion of employee ownership, and organization-wide moral discourse (2001, p. 115). Fort's conceptualization of the size of a mediating institution is more aligned with that of Berger and Neuhaus: the smaller the better, so that individuals have the opportunity to experience first-hand the consequences of their actions and learn the role of the good organization citizen (Fort 1996). While not written in the language of public policy, Fort suggests the necessity of policy mechanisms (such as tax incentives and social audits) to motivate businesses to formally take on the role of mediation institutions (2001, p. 115).

While not focusing on employers or businesses, Weiss and Tschirhart examine the role of mediating institutions in facilitating government-sponsored public information campaigns (1994). In reviewing the promotional materials for 100 such campaigns, these scholars observe that many campaigns target mediating institutions, including families and communities, to provide a social context for members that will reinforce the behavioral goals of public

information campaigns. In doing so, mediating institutions can serve as an additional channel through which messages about desired behavioral changes can be disseminated.

Henry and Gordon, testing Weiss and Tschirhart's assertions, are the first scholars to identify employers as mediating institutions for public policy implementation. These scholars evaluate a public information campaign in Atlanta, GA, to determine whether altering workplace norms affect driving behavior on ozone-alert days (2003). The campaign in question works through public and private employers to disseminate messages regarding the importance of telecommuting, alternative work schedules, and alternative commute options on days anticipated to be smoggy. State agencies are required by executive order to reduce single-occupancy vehicle commutes by 20 percent on high ozone days and to develop plans for achieving that goal. While federal employers in the area face no such mandate, they nonetheless have agreed to develop and execute strategies for reducing commuting. Local government agencies have been encouraged by the public information campaign to do the same. Using daily telephone survey data from 4860 Atlanta residents over a 153-day period, Henry and Gordon analyzed awareness of ozone issues and daily driving patterns. Given that state institutions are mandated to reduce commuting on ozone alert days, and that federal and local agencies have followed suit, Henry and Gordon use an individual's employment by a government agency as a proxy for membership in a mediating institution. The results indicate that employees of these mediating institutions are responsible for almost all of the reductions in commuting miles on ozone alert days, leading the authors to conclude that without institutional cooperation, alternatives to solo commutes during rush hour are not an option for many employees.

The research presented in this paper shares common elements with various aspects of the literature on mediating institutions. As do Berger and Neuhaus, we contend that mediating

institutions can ease citizens' feelings of alienation from the state. In the case of commute options programs, avoiding rush-hour traffic and solo commuting to work may make employees feel they are doing their part in alleviating traffic congestion and air quality. Like Madden, we concur that corporations play a critical social role, particularly in an age of dwindling resources for direct government intervention in complex policy problems. We agree with Fort that employers are a primary mediating institution for most citizens. Like Henry and Gordon, we focus on employers as mediating institutions. Unlike Henry and Gordon, our mediating institutions include mostly voluntary private employers. As in Weiss and Tschirhart's study, our policy mediators are disseminating messages that encourage conformance with government goals, in this case, reduced traffic congestion and improved air quality.

Employers as Mediating Institutions for Traffic Congestion and Air Quality

Traffic congestion and poor air quality are intertwined policy problems that plague metropolitan areas across the nation. Sprawling urban development patterns and a dramatic increase in the number of vehicles in the United States have produced traffic congestion that has clogged the nation's highways and interstates. Citizens and policymakers alike consistently rank traffic congestion as an important quality-of-life issue (TRB, 2001; Burchell, et al, 2002).

Traffic congestion also incurs significant economic costs, by some estimates \$63 billion per year in fuel and time losses to the traveling public in urban areas (Schrank and Lomax, 2002).

In addition to lowering quality of life and incurring significant economic costs, traffic congestion is a public health issue. Vehicles produce 40 to 60 percent of the emissions that contribute to ground-level ozone in urban areas, which aggravates breathing for children, the

elderly, and people with respiratory conditions (USEPA, 2003). Furthermore, congested traffic generally produces more emissions than free-flowing traffic (TRB, 1995).

To understand the importance of employers as mediating institutions for traffic congestion and air quality, one must first understand how work travel contributes to these problems. Over three-quarters of all trips made to and from work in the United States in 2000 were in single-passenger vehicles (Reschovsky, 2004). In the context of this study, vehicle commuting to work and back represents approximately 22 percent of all daily trips taken in the Atlanta region (ARC, 2003). While 22% may not seem a significant figure, this fraction of activity occurs predominantly under congested conditions, which significantly elevates fuel consumption and emissions for all vehicles operating during the commute period. Furthermore, civil engineers design and construct highway systems to facilitate travel during the most congested condition. Hence, tremendous capital infrastructure costs are associated with providing freeway lanes that are needed for only a few hours each day. Thus reductions in single-occupancy work commutes have a significant potential to reduce peak-period congestion which, in turn, reduces total daily regional emissions by a few percent. This seemingly minor emissions reduction for most urban areas is significant given the requirement to achieve attainment of the national ambient air quality standards.

While employers do not necessarily control how employees get to work, employers do control work modes and work schedules that influence these patterns. For example, compressed work weeks allow employees to work forty-hours in four days or eighty hours in nine days, thereby eliminating the need for a day of commuting to the worksite. Teleworking (also known as telecommuting) allows employees to work at home or at another location part-time or full-time, thereby eliminating commuting during these times. Flexible scheduling enables employees

to avoid rush hour traffic by establishing their own start and finish times for work. Employers can also provide incentives to employees that reduce solo commuting, such as preferential parking for vanpools and deduction of transit and vanpool expenses from pre-tax income.

Because U.S. employers are not required to offer commute options to employees, public agencies and nonprofit associations concerned with traffic congestion and air quality promote commute options to employers. For example, the U.S. Environmental Protection Agency and the U.S. Department of Transportation co-sponsor “Best Workplaces for Commuters”, a program which publicizes employers that offer commute options. In addition to providing public recognition, Best Workplaces for Commuters offers training on implementing commute options programs and access to web-based tools for program tracking.

At the local level, transportation management associations (TMAs) provide commute options services to employers. These geographically-based alliances of employers and property managers offer technical assistance and centralized coordination of programs that employers can participate in, such as ridesharing and guaranteed ride home programs. There are 130 TMAs across the United States, eight of which are located in the Atlanta metropolitan area.

The Clean Air Campaign is another source of commute options assistance for Atlanta employers. A partnership of government, business, civic, health, environmental and educational organizations, the Clean Air Campaign is a non-profit organization that serves as an information clearinghouse for metropolitan Atlanta organizations (including TMAs) that have programs in place to address traffic congestion and air pollution. The Clean Air Campaign provides services similar to those provided by Atlanta’s eight TMAs, although there are three key differences. First, the Clean Air Campaign publicizes the participation of its members through an online membership listing and case studies that profile programmatic successes, whereas TMAs do not.

Second, the Clean Air Campaign focuses on initiatives across Atlanta, whereas TMAs operate within specific geographic areas. For example, the Clean Air Campaign launched the Telework Leadership Initiative in 2003, selecting 17 employers across the metropolitan Atlanta area to receive consulting services and staff reimbursement funds to develop teleworking programs over a six-month period. Finally, the Clean Air Campaign's annual budget is quite large (approximately \$7 million) and much of the funding is dedicated to mainstream media advertising campaigns designed to increase public awareness of transportation and air quality issues.³

Theory and Hypotheses

This section focuses on the theoretical bases for hypotheses regarding an employer's willingness to serve as a mediating institution for traffic congestion and air quality concerns. Four organizational attributes are expected to influence an employer's willingness to offer commute options to employees: (1) the perception that doing so advances organizational self-interest, (2) internal control exerted over employees, and (3) membership in associations that promote policy mediation. These factors were chosen for their applicability to commute options programs, as well as their potential influence on employer willingness to mediate other types of public policy problems.

Self-Interest and Policy Mediation

Why do employers voluntarily mediate policy problems? Organizational self-interest is a logical starting point (Madden, 1980, p. 116). From this perspective, firms may behave voluntarily in ways that benefit society only when there is a perceived economic payoff (direct or

indirect) for doing so. The literature on corporate environmental behavior is replete with examples that demonstrate the importance of perceived self-interest in motivating pro-social behavior: Industrial facilities may voluntarily exceed regulatory requirements in an effort to influence future regulations (Lyon and Maxwell, 2004; Maxwell, Lyon and Hackett, 2000; Segerson and Micelli, 1998), seek public recognition (Arora and Cason, 1996), or attempt to differentiate themselves in the marketplace (Prakash, 2000). Government agencies appear to be convinced of the importance of corporate self-interest when they stress the direct and indirect economic benefits of voluntarily participating in public policy programs (Welch, Bretschneider and Mazur, 2000).

Government and nonprofit organizations devoted to traffic congestion and air quality issues assert that commute options programs can strengthen personnel recruitment and retention, improve employee productivity, and enhance public image. Commute options are expected to enhance productivity because employees spend less time in traffic and more time at work. Less time commuting means more time to balance work and family, strengthening a firm's ability to recruit new employees and retain existing ones. Flexible work schedules designed to minimize commute times may also play a role in employee recruitment and retention. Commute options programs are also expected to enhance an organization's reputation by signaling that they are good employers and good corporate citizens.

Based on the benefits touted by government promoters of commute options programs, employers perceiving these positive impacts from commute options work modes are expected to make them more widely available to employees. While the hypothesis seems self-evident, testing it will suggest the persuasiveness of current marketing messages: If no such relationship is found, then program promoters may be tapping the wrong employer motivations.

Organizational Control

The extent to which an organization controls its employees may also influence its willingness to mediate policy problems. Organization control is defined as actions taken to reduce employee discretion (Wintrobe, 1982) and align employee behaviors with organizational goals (Hall, 1963). Policy mediation, by definition, requires employers to sacrifice some control by allowing workplace norms to be aligned with broader societal norms. For example, companies that participate in the Voluntary Protection Program of the U.S. Occupational and Health Safety Administration (OSHA) seek to empower employees to make companies accountable for worker safety. Participants in the program are thus required to provide their employees with access to self-inspections and safety data; enable employees to report hazards; and to file a complaint with OSHA if the employer does not comply with the terms of the voluntary agreement. In the OSHA example, companies empower employees to hold them accountable for broader societal obligations, an endeavor which requires relinquishment of some control.

Potter notes that commute options programs reduce managerial control over employees by altering work patterns (2003). For example, telecommuting employees work at home, out of direct supervisory site, facilitating shirking and opportunistic behaviors. Flexible work schedules, which allow employees to work staggered rather than fixed schedules, impose greater uncertainty and complexity in scheduling. For example, it may become more difficult to schedule meetings or coordinate tasks when employees work different schedules. Compressed work weeks reduce the number of days that employees work onsite, thereby increasing the risk that employees will be needed on an “off” day. Given the potential for commute options work

modes to complicate managerial control, more controlling organizations are expected to make these work modes less available to employees.

Association Membership

Voluntary associations may also play an important role in persuading employers to serve as policy mediators. Voluntary associations have been defined in various ways, including “a body of people who have organized themselves in pursuit of particular goals” (Berger and Neuhaus, 1977, p. 34). Associations provide a socialization process by which identity is developed and norms are communicated (Fort, 1996). Members, in turn, conform their behavior to the norms of the association because they desire the approval and respect of fellow members and because doing so will enhance their reputation (King, 2002).

The corporate environmental behavior literature provides much of the evidence that association membership affects behavioral change in organizations. Firms that are members of environmental groups tend to have lower toxic releases than firms not belonging to such groups (Maxwell, Lyon and Hackett, 2000). Trade groups have been shown to influence marinas to undertake best environmental practices (May, 2003). And bleached Kraft pulp producers that were members of environmental groups were more likely to use cleaner technologies than non-members (Maynard and Shortle, 2001). In these examples, the associations serve as mediating institutions by influencing their members to behave in socially desirable ways. This leads to the expectation that employers that are members of voluntary associations addressing air quality and traffic congestion issues will offer more commute options work modes to employees than non-member employers.

Data

The hypotheses are tested with data collected from a cross-sectional mail survey of Atlanta employers conducted between April 2003 and January 2004. The sample comprised a random selection of organizations employing less than 5000 employees from the Metropolitan Atlanta Chamber of Commerce (MACOC) membership list ($n=262$); a census of MACOC members employing over 5000 employees ($n=38$); a random selection of 300 employers of 4000 household participants in the SMARTRAQ regional travel diary study⁴; and all 207 employers of household participants in the Commute Atlanta study, a research effort designed to examine the influence of variable pricing on driving behavior.⁵

Employers were telephoned to identify their human resource directors and to verify contact names, titles, and mailing address information. Human resource (HR) directors were selected as the survey contact because they tend to be involved in the implementation of commute options programs. Once contact data were finalized, the survey process proceeded in four stages. First, an alert letter was mailed to the sample notifying them that the survey was forthcoming and explaining the survey's purpose and importance of participation. A few days later the sample was mailed a printed survey with cover letter, a postage-paid return envelope, and a one-dollar incentive. The cover letter conveyed that recipients could decline participation by returning the blank survey. The survey also allowed HR directors to respond by web, giving them a website address and unique identification number to enter the site. A reminder follow-up postcard was mailed a few days after the first survey package. Non-respondents were contacted two weeks later with a cover letter emphasizing the importance of participation, a replacement survey, and a postage-paid return envelope.

An additional contact was made with Chamber members, which consisted of a replacement survey with a postage-paid return envelope, another one dollar incentive, and a cover letter from the president of the Metropolitan Atlanta Chamber of Commerce (MACOC) requesting participation. Rather than targeting human resource directors, the follow-up MACOC letter was addressed to upper-level managers in charge of operations. This additional contact boosted response rates from the Chamber sample by approximately seven percent. Additional details on recruitment and survey methods can be found in Feng, et al. (2005).

Prior to administering the full survey to these employers, a pre-test survey was conducted among 30 companies randomly selected from a web-based directory. The pre-test process resulted in minor changes to the survey, including the clarification of ambiguous wording and the elimination of individual items that had yielded non-variant responses.

The survey process yielded a 51 percent response rate (n=412), with 40 percent of respondents from the Metropolitan Atlanta Chamber sample (n=166); 25 percent of respondents from the Commute Atlanta employer sample (n=105); and 34 percent of respondents from the SMARTRAQ employer sample (n=141). (The response rates within these sampling frames were 55, 51, and 47 percent, respectively.) To estimate nonresponse bias, the size of firms returning surveys were compared to those not returning them. This exercise was conducted for the Chamber sample only, because this sampling frame was the only one for which size information was available. A Chi-Square test indicates that firm size is independent of response rate (Chi-Square Statistic=1.27, Asympotic Sig=0.97).

Models and Measures

The statistical models employed here seek to accomplish two goals. The first goal is to estimate the influence of organizational characteristics on the availability to employees of three different commute options work modes. The second goal is to evaluate how various employer policy mediation activities related to traffic congestion and air quality influence employee commute behavior. The models of work mode availability employ an ordered probit approach because the three dependent variables (levels of availability to employees of compressed workweeks, flexible scheduling, and teleworking) are ordinal, but the exact distances between levels of availability are unknown (Long, 1997, p. 114). The second model uses two-sided Tobit because the dependent variable, percentage of employees driving to work alone, is truncated at 0 and 100. Tables 1 and 2 list descriptive statistics for the dependent and explanatory variables in both models.

Determinants of Employer Policy Mediation

The dependent variables in the first set of models are the levels of availability to employees of work modes that avoid rush-hour commutes. There are three work modes relevant to commute options: flexible work schedules, compressed workweeks, and one or two days of teleworking per week. Work modes are coded “0” for “not available to employees”, “1” for “available to some employees”, and “2” for “available to all employees”.

The independent variables to be used include organization control; the perceived benefits of particular commute options work modes; membership in the Clean Air Campaign, an Atlanta-wide nonprofit association that promotes employer mediation activities for traffic congestion and air quality; membership in transportation management associations, which also promote

employer mediation activities for traffic congestion and air quality, but pertain to specific geographic areas; and membership in both the Clean Air Campaign and a transportation management association. The total number of people employed at the worksite (size) is included as a control variable, as is a dummy variable indicating whether the survey respondent is a state agency, institution of higher learning or federal agency. The identity of these organizations is important because state agencies and public institutions are required, by a 1997 gubernatorial executive order, to formulate commute options plans for ozone alert days. Although not a requirement, federal agencies in the Atlanta area followed suit as a result (Henry and Gordon, 2003, p. 51).

Three measures of organization control are employed: procedural control, job autonomy, and hierarchy. Procedural control is operationalized by a scale that sums a respondent's level of agreement (from 0=strongly disagree to 3=strongly agree) with the following three statements about their organization's control preferences: (1) *Going through proper channels is constantly stressed*; (2) *Whatever situation arises, we always have proper procedures for dealing with it*; and (3) *In this organization, compliance with rules and procedures is very important*. Thus the procedural control scale ranges in value from 0, indicating strong disagreement with all three statements, to 9, indicating strong agreement with all three statements. Cronbach's alpha for the scale is 0.70. Job autonomy is taken as survey participant's level of agreement (from 0=strongly disagree to 3=strongly agree) with the following statement: *The way work is done is left pretty much to the employee doing the work*. (The organization control and employee autonomy measures are based on Aiken and Hage 1966). Hierarchy is measured using survey participant's numerical assessment of the level of hierarchical authority in their organization, from 0

signifying few layers of authority to 10 signifying many layers of authority (Bozeman and Rainey, 1998).

Three dummy variables are implemented for membership in associations that promote commute options: one dummy variable for members of only the Clean Air Campaign (nine percent of the sample); one dummy variable for members of only a transportation management association (three percent of the sample); and one dummy variable for members of both (six percent of the sample). In each case, variables are coded “1” to indicate membership or “0” to indicate non-membership.

Benefits are measured by a scale that sums the survey respondent’s indication of the nature of the impacts (0=Negative, 1=Neutral, 2=Positive) that commute options have on recruitment, retention, productivity, and reputation. The commute options programs of interest include compressed workweeks, flexible arrival and departure times and one to two days per week of teleworking. Thus, benefit scores range from “0” for employers perceiving negative impacts from all modes to “8” for employers perceiving positive impacts of all modes.

Modeling Employee Commute Behavior

The second model examines the impact of employer mediation activities on the percentage of employees that drive alone to work. Four types of activities are examined, all of which may influence employee behavior, not only by facilitating solo commute alternatives, but also by signaling employer values. The first mediation activity is the provision of personnel benefits that facilitate alternative commute patterns. This activity is operationalized as the sum of such benefits offered by an employer. There are nine activities of interest, including the pre-tax deduction of public transit expenses and participation in a guaranteed ride home program.⁶

Twenty percent of survey respondents offer at least one of these benefits, and 15 percent offer two or more benefits. By contrast, fifty-four percent of the respondents offer none of these benefits. Employers that offer more commute-related benefits are expected to have lower percentages of employees driving to work alone.

The second employer mediation activity is the extent to which employers promote commute options programs. Three programs are of interest: guaranteed ride home, which guarantees ridesharing employees a trip home under emergency circumstances; 1-800-RIDEFIND, which located fellow carpoolers for commuters; and the promotion of public transit routes and fares. Promotion frequency includes “Never” or “Rarely” (0); “Once or Twice Per Year (1); or “Each Month or More” (2). The measure sums the promotion frequency for all three programs. Thus, potential scores range from 0, for all three programs rarely promoted, to 6, for all three programs promoted monthly or more. Eighty percent of the sample rarely promotes any of the three programs, while twenty percent of employers in the sample promote at least one program once or twice a year. Employers that promote these commute options more frequently are expected to experience a lower percentage of employees driving to work alone.

The third mediation activity is the provision of parking incentives for employees using commute options, including preferential or reserved parking for carpools and vanpools, shuttle service to and from offsite parking areas, cash or transit passes to employees who give up parking spaces, and preferential or reserved parking for alternative fuel vehicles. Parking incentives are treated as unique given the critical impact that parking availability has on commute behavior (Vaca and Kuzmyak, 2005). The parking incentives variable ranges from zero, indicating none of the four incentives are offered, to four, indicating that all of the incentives are offered. Fifteen percent of the sample offers at least one these incentives, while

eighty-five percent of the sample offers none. Employers offering more of these incentives are expected to have lower solo commuting rates.

The fourth policy mediation activity is employee-paid parking, which is also expected to significantly lower the percentage of employees that drive to work alone. The provision of free parking is a significant economic benefit factored into the commute decision. Approximately 85 percent of respondent organizations offer free parking to their employees. Employee-paid parking is measured as a dummy variable, with 0 indicating those organizations that pay for employee parking and 1 for those organizations that require employees to pay for their own parking.

Parking availability is also included in the model as a control variable, based on the assumption that more time required to find parking is a deterrent to solo commuting. This variable is coded “0” if parking can be immediately found upon arrival to work; “1” if it takes a few minutes to find parking; and “2” if parking takes five or more minutes.

Modeling Results

Commute Options Work Mode Availability Models^{7,8}

Table 3 outlines results of the compressed workweeks model. As expected, organizations that perceive higher benefits from compressed workweeks indicate more availability of compressed workweeks to employees ($p < 0.01$). Also as expected, organizations who are members of the Clean Air Campaign and both the Clean Air Campaign and a transportation management association make compressed workweeks more available than nonmembers of such associations ($p < 0.01$ and $p < 0.05$, respectively). However, membership in a transportation management

association alone is not a significant model influence. Hierarchy is associated with less compressed work week availability ($p < 0.10$), as expected, although procedural control is not a significant model influence. Higher employee autonomy is correlated with less availability of compressed work weeks, contradicting expectations ($p < 0.10$). Larger organizations make compressed work weeks more available to employees than do smaller organizations ($p < 0.05$). Status as a state institution or federal agency is not a significant model variable. Fully standardized coefficients indicate that perceived benefits, Clean Air Campaign membership, and organization size are the strongest model influences.⁹ McKelvey and Zevoina's R^2 , which for ordinal outcomes most closely approximates the ordinary least squares R^2 statistic (Long and Freese, 2003, p. 163), is 0.23 for this model

Ordered probit results for the flexible scheduling model are outlined in Table 4. The perception of flexible scheduling benefits is associated with a greater availability of flexible scheduling to employees ($p < 0.01$). Procedural control is a significant influence in this model, associated with less availability of flexible scheduling to employees ($p < 0.05$). Hierarchy, however, is an insignificant model influence. Employee autonomy is associated with greater availability of flexible scheduling to employees ($p < 0.05$), in contrast with its negative correlation to compressed work week availability. Clean Air Campaign membership is associated with greater availability of flexible scheduling to employees ($p < 0.10$), but neither membership in a transportation management association nor memberships in both the Clean Air Campaign and a transportation management association are significant model influences. Organization size and classification as a state institution or federal agency are associated with a higher availability of flexible scheduling to employees (both $p < 0.05$). Fully standardized coefficients indicate that

perceived benefits of flexible scheduling is by far the strongest model influence, with employee autonomy serving as a distant second. McKelvey and Zevoina's R^2 is 0.30 for this model.

Table 5 lists results for the telecommuting model, whose dependent variable is the level of availability to employees one to two days per week of working from home. Positive perceived benefits from telecommuting are associated with greater availability of telecommuting to employees ($p < 0.01$). Employee autonomy is associated with greater availability of telecommuting ($p < 0.01$), whereas higher procedural control is associated with lesser availability ($p < 0.10$). Once again, hierarchy is not a significant model influence. Clean Air Association membership is associated with a higher availability of telecommuting ($p < 0.01$), although membership in a transportation management association only or membership in both the Clean Air Campaign and a transportation management association are insignificant model influences. Organization size is a significant positive influence on telecommuting availability ($p < 0.05$),¹⁰ but status as a state institution or federal agency is not. Fully standardized coefficients reveal that perceived benefit is the strongest influence on work mode availability, with employee autonomy a distant second in strength. McKelvey and Zevoina's R^2 for this model is 0.30.

One way to substantively interpret ordered probit results is to examine the probability changes in the values of the dependent variable given changes in the values of the explanatory variables, holding other model influences constant (Long, 1997, p. 135). Table 6 lists these probability changes in the three levels of availability of each work mode given a move from minimum to maximum values of the statistically significant independent variables, holding all other variables constant.

Going from the smallest to largest employer produces the largest increases in the probability of offering commute options work modes, although more so for compressed

workweeks and teleworking (69 percent and 61 percent) than for flexible scheduling (20 percent). A move from the lowest to the highest value of perceived benefits is also associated with sizeable increases in probabilities that organizations will offer commute work modes to some or all employees. This effect appears highest for flexible scheduling (59 percent) and lowest for compressed workweeks (37 percent).

Clean Air Campaign membership has the most impact on the probabilities of offering compressed workweeks and teleworking to some or all employees (29 and 27 percent increases over nonmembers), with lesser impacts on the probability of offering flexible scheduling (8 percent). Membership in both the Clean Air Campaign and a transportation management association is associated with a 19 percent increase in the availability to some or all employees of compressed workweeks. An organization's status as a state institution or federal agency increases the probability of offering flexible scheduling by 17 percent.

A move from lowest to highest employee autonomy increasing the probabilities of offering teleworking and flexible scheduling to some or all employees by 34 percent and 25 percent, respectively, while it lowers the probability of offering compressed work weeks by 22 percent. A move from lowest to highest procedural control reduces the probability that an organization will offer teleworking by 30 percent, as well as the probability that an organization will offer flexible scheduling by 21 percent. An increase from the least to the most hierarchical organizations reduces the probability of offering compressed workweeks by 15 percent.

Employee Commute Behavior Model

Coefficients¹¹ from the Tobit regression model of solo-commute behavior are reported in Table 7.¹² For every additional commute options benefit offered, the reported percentage of employees

driving to work alone decreases by 2.5 percent ($p < 0.01$). Every additional increase in the level of promotion frequency reduces solo commute percentages by nearly two percent ($p < 0.05$). Additional time required to find a parking space decreases drive-alone percentages by nearly four percent ($p < 0.05$). However, the number of commute-alternative parking incentives and employee-paid parking do not significantly influence the percentage of employees driving to work alone ($p > 0.10$). The chi-square statistic for the model (calculated by doubling the difference in the estimated log-likelihoods for the fitted model and a null model with only an intercept) is significant at five degrees of freedom (80.67, $p < 0.00$), indicating an acceptable fit.

An examination of fully standardized coefficients indicates that the provision of commute options benefits has the strongest effect on drive-alone percentages, with a one standard deviation increase in benefits (1.70 of nine benefits) reducing the percentage of drive-alone employees by 0.56 of a standard deviation (8.40 percent). Time to park has the second strongest effect, in which a one-standard deviation increase in time required to park (roughly $\frac{1}{2}$ of a three-point scale) also reduces solo commuting by 0.27 of a standard deviation (four percent). A one standard deviation increase in promotion frequency (1.05) also decreases drive-alone percentage rates by 0.27 of a standard deviation (four percent).

Discussion

Let us begin by interpreting the results of the commute options work modes models. To facilitate discussion, Table 8 reports the coefficients and significant levels of the explanatory variables across the different types of work modes.

The model results support the hypothesis that organizations perceiving more benefits from commute options work modes will make them more available than organizations perceiving

less such benefit. The perception of organizational benefit appears to be the strongest predictor of the availability of the various alternative work modes. These results suggest that mediation behavior is indeed driven by self-interest (Fort, 1996; Madden, 1980). The more practical implication of the result is that government promoters have correctly identified the advantages of commute options, namely, employee retention, employee recruitment, and productivity. This is no small matter for government and nonprofit promoters of commute options: Knowing that marketing messages are “on target” is one form of program effectiveness that contributes to successful recruitment of organizations into the program.

The organizational control measures yield mixed results for their influence on work mode availability. Higher procedural control is associated with less availability of flexible scheduling and teleworking, but has no statistically significant effect on compressed work weeks. Hierarchy is associated with less availability of compressed workweeks, but has no statistically significant effect on flexible scheduling or teleworking availability. Employee autonomy is associated with greater availability of flexible scheduling and teleworking, but less availability of compressed workweeks.

Hierarchy and procedure may vary in the significance of their impacts on work mode availability because they invoke different types of control. Hierarchy involves layers of authority for approving organizational tasks which may be hindered if employees (either the ones seeking approval or the ones granting it) are onsite for fewer than five days. By comparison, procedural control, which seeks to reduce organizational uncertainty by the imposition of rules, may have more negative impacts on teleworking and flexible scheduling because these work modes, by definition, invoke a greater level of uncertainty in how and when employees perform their duties. Finally, the negative relationship between employee autonomy and compressed work weeks may

indicate a tradeoff between autonomy and time: Allowing personnel to choose how and when they perform tasks may work against compressing work into fewer days.

The results support the hypothesis that members of the Clean Air Campaign will make commute options work modes more available than non-members. However, membership in transportation management associations does not significantly influence work mode availability. And only in the case of compressed workweeks does membership in both organizations increase work mode availability to employees. It should be noted that the Clean Air Campaign is an Atlanta-wide initiative, with a much larger budget and a higher percentage of federal funding than most transportation management associations, which pertain to specific geographic areas and can vary widely in the scope of their mediation activities. The broader implication of the result is that certain associations (in this case, well-funded and broadly based) may more effectively serve as mediating institution recruiters.

It is also possible that Clean Air Campaign membership increases commute option mediation activities, not due to association persuasion, but because good corporate citizens self-select into its membership. From this perspective, the Clean Air Campaign membership may be biased towards organizations motivated to contribute to the public good in a manner similarly ascribed to public servants (Brewer, Selden and Facer 2000, Perry and Wise 1990, Perry 1997). Unfortunately, we lack the data to distinguish the effects of an organization's public service ethic from the efficacy of the Clean Air Campaign exhortations to provide commute options to employees.

The final modeling exercise seeks to explain the percentage of employees that drive to work alone as a function of four employer mediation activities (Table 7). Two of the four activities significantly influence the percentage of employees that drive to work alone. The first

is the provision of commute options benefits, including access to guaranteed ride home program, the pre-tax deduction of carpool, vanpool and transit expenses, and onsite sale of tokens and transit passes. An examination of fully-standardized coefficients indicates that the availability of these benefits exerts the strongest influence on solo commute percentages. Perhaps commute options benefits are an important mechanism for altering commuting behavior because they signal an organization's willingness to invest its own resources in addressing traffic congestion and air quality, in addition to providing mechanisms that facilitate an employee's ability to take individual action in addressing these problems.

The frequency with which employers promote external commute options programs appears to have a significant influence on solo commuting. While such promotion activity is not as resource intensive as the provision of personnel benefits, it still may have the effect of communicating to employees social norms of importance to the organization.

The model's two remaining employer mediation activities, parking incentives and employee-paid parking, do not significantly influence solo commuting. The insignificance of employee-paid parking appears, at first, to contradict decades of studies on the influence of paid parking on solo driving (TRB, 2005). However, these studies address parking pricing elasticity – the relationship between parking pricing and parking consumption -- rather than the relationship between employee-paid parking and solo commute percentages. It is possible that employee-paid parking is not a significant model influence because time to park has greater impacts on solo driving than paying or not paying for parking. This suggestion is born out by the exclusion of time-to-park in the Tobit model, which produces a significant negative effect for employee-paid parking ($p < 0.05$). More research is needed to explore the relative contribution of various internal mediating activities on solo commute patterns.

It is striking that even the strongest influence on solo commuting behavior makes only small dents in the percentages of employees that drive to work alone. Keep in mind that Atlanta commutes are more like journeys: According to the 2003 American Community Survey, five metropolitan Atlanta counties have commutes that fall into the top 100 of all counties in the nation. Residents of Gwinnett County, eighteenth on the list, average a commute time of 30.8 minutes, tying with Cook County, IL, and Riverside County, CA (U.S. Census Bureau, 2003). That the vast majority of Atlanta employees insist on solo commutes under these arduous conditions indicates the challenges of modifying driving behavior in an automobile-dependent society.

Three caveats are in order. First, the results are limited by the use of Atlanta employers for the study sample. The Atlanta corporate community has a reputation for “civic cooperation,” working internally and with public officials to further the public interest, an approach applied in particular to urban planning and revitalization (Stone 1989). Thus, the mediation activities of Atlanta employers may not translate to metropolitan areas whose corporate communities lack a history of civic cooperation on public issues.¹³ Second, the sample does not represent Atlanta employers as a whole, given the use of the Metropolitan Atlanta Chamber membership list (forty percent of the sample), which over-represents larger organizations and possibly “good corporate citizens” more likely to engage in policy mediation. Third, the data are based on managerial estimates of employee commute patterns, which could be inaccurate or biased. Additional research is needed using more objective assessments of employee behavior.

Conclusion

This paper has analyzed the role of employers as mediating institutions for employee commuting behavior, which affects traffic congestion and air quality. The results yield two broad conclusions. First, employers can influence employee commute behavior through policy mediation activities, although the magnitude of these changes is small. Second, certain employer attributes are associated with a greater propensity to mediate through commute options activities, including voluntary association membership, organization control, and perceived self-interest. Knowing these characteristics is important to government and non-profit promoters of commute options programs, who must “know their clients” and be able to effectively invest marketing resources -- public dollars -- where participation is most likely.

These results raise a broader issue associated with the role of government in promoting voluntary mediation to employers. Given dwindling government resources and waning political will to impose direct control over individual behavior, policymakers may increasingly attempt to persuade employers to mediate society’s most pressing and intractable problems, such as individual driving behavior. This persuasion constitutes a “marketing” function that is significantly different from the coercive role to which policy managers are used to playing. The question becomes the extent to which public organizations can separate their coercive functions from their marketing functions. Will an agency’s desire to sell compromise its ability to enforce? Will private sector organizations use policy mediation as a means of offsetting coercive requirements? Will policy mediation align the will of the state with the will of private organizations in ways that could potentially oppress, rather than empower, citizens? These queries are beyond the scope of this study, but are critical to a thorough understanding of the role of employers as mediating institutions for public policy.

Notes

1. Employers can be coerced or persuaded to serve as mediating institutions. For example, regulations by the U.S. Occupational Safety and Health Administration requiring employers to post safety information for workers constitute a coercive requirement to mediate public policy. By contrast, this study focuses on those factors associated with voluntary decisions to mediate policy problems.

2. We appreciate the suggestion of an anonymous reviewer, who urged a more careful delineation of the different conceptualizations of mediating institutions by the scholars discussed in this section.

3. In fact, the Clean Air Campaign implemented the public information campaign studied by Henry and Gordon (2003). SMARTRAQ stands for Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality, a \$4 million, seven-year study of Atlanta's transportation and land use patterns. Participants in the study were recruited by random digit dialing and stratification by household income, land-use type and household size (Wolf, et al, 2000).

4. The Commute Atlanta Study consisted of households within the metropolitan Atlanta area selected by random digit dialing and stratified by household income, land-use type and household size.

5. These benefits include showers for employees biking or walking to work; onsite sale of transit passes/tokens; organizational membership in guaranteed ride home program (which provides

rides home in emergency situations for employees that have carpooled or vanpooled to work); employer-subsidized bus, rail, or vanpool passes; bicycle lockers; employer-coordinated carpool or vanpool; satellite offices from which employees can work; pre-tax deductions of carpool, vanpool, and transit expenses; and brokering of discount bus, rail, and vanpool passes.

6. Ordered probit assumes “parallel regression,” meaning that each explanatory variable has the same effect on the odds of different values of the dependent variable (Long, 1997, p. 140; Long and Freese, 2003, p. 168). To illustrate, the coefficient from a binary regression model estimating the relationship between employee autonomy and the probability of indicating that compressed workweeks are available to some employees or no employees ($y \leq 1$) should be roughly the same as the coefficient that estimates the relationship between employee autonomy and the probability that compressed work weeks are available to all employees, some employees and no employees ($y \leq 2$). The parallel regression assumption is violated for three of nine independent variables in the flexible scheduling model (hierarchy, Clean Air Campaign membership, and government agency status); for one of the nine independent variables in the compressed work weeks model (hierarchy); and for none of the independent variables in the teleworking model.

7. As Long and Freese note, this is a frequently violated assumption of ordinal probit (p. 168).

8. In response to violations of the parallel regression assumption, we replicate these results using ordinary least squares modeling and find that the direction and significance of the coefficients are highly similar in each of the three models. A normal probability plot of the OLS residuals indicate minor departures from normality for the flexible scheduling and teleworking models, but

more significant normality departures for the compressed workweek model. To test for multicollinearity, we performed ordinary least squares regression for both models and examined the resulting Variance Inflation Factor (VIF) scores. VIFs are calculated by regressing each independent variable on all other independent variables and then calculating the inverse of 1 minus the resulting R². The VIF scores from the three models never exceed 1.50, thus falling far short of the score of five that would suggest collinearity concerns (Berk, 2003, p. 121).

9. Fully standardized coefficients convey the change in the standard deviation of the dependent variable given a one-unit increase in the standard deviation of an independent variable, holding other independent variables constant.

10. While not a variable of theoretical interest, organization size appears to consistently influence an employer's ability to offer commute options work modes. This result may be due to larger firms having more resources available to coordinate and monitor alternative work patterns and, in the case of telecommuting, provide computers and phone lines for at-home employees.

11. Some scholars contend that straightforward Tobit coefficients do not have much substantive interpretation because the results apply to a latent variable (McDonald and Moffit 1980). Still others interpret Tobit coefficients in the same manner as ordinary least squares coefficients (Long 1997). We employ the latter approach for the sake of providing more substantive meaning to the study results.

12. The presence of heteroskedasticity in the model residuals led to the use of White's heteroskedasticity-robust standard errors. Non-normal residuals were also detected. A Box-Cox transformation of the dependent variable (not reported in this table, but available upon request) led to greater residual normality and produced the same model results.

13. We thank the anonymous reviewer who raised the possibility that Atlanta organizations may be predisposed to a commitment to civic affairs, given their history of involvement in metropolitan governance (Stone 1989).

References

Aiken, Michael, and Jerald Hage. 1966. Organizational Alienation: A Comparative Analysis.

American Sociological Review 31 (4):497-507.

ARC. 2003. *Atlanta Region Transportation Planning Fact Book 1998*. Atlanta, GA: Atlanta Regional Commission.

Arora, S., and T. N. Cason. 1996. Why Do Firms Volunteer to Exceed Environmental Regulations? Understanding Participation in EPA's 33/50 Program. *Land Economics* 72 (4):413-432.

Berger, Peter L., and Richard J. Neuhaus. 1977. *To Empower People: The Role of Mediating Structures in Public Policy*. Washington, D.C.: American Enterprise Institute for Public Policy Research.

Bozeman, B., and H. Rainey. 1998. Organization Rules and the Bureaucratic Personality.

American Journal of Political Science 42 (1):163-198.

Brewer, G. A., S. C. Selden, and R. L. Facer. 2000. Individual Conceptions of Public Service

- Motivation. *Public Administration Review* 60 (3):254-264.
- Burchell, R.W., N.A. Shad, D. Listokin, H. Phillips, A. Downs, S. Seskin, J.S. Davis, T. Moore, D. Helton, and M. Gall. 1998. *Costs of Sprawl Revisited*. Washington, D.C.: Transportation Research Cooperative Program.
- Feng, Chunxia, Leisha DeHart-Davis, and Randall Guensler. 2005. Survey Design and Preliminary Results for Atlanta Employer Commute Options Survey. Paper read at Air and Waste Management Association 98th Annual Meeting, at Pittsburgh, PA.
- Fort, Timothy L. 1996. Business as Mediating Institution. *Business Ethics Quarterly* 6:149-163.
- Fort, Timothy L. 1997. The Corporation as Mediating Institution: An Efficacious Synthesis of Stakeholder Theory and Corporate Constituency Statutes. *Notre Dame Law Review* 73:173-.
- Fort, Timothy L. 2001. *Ethics and Governance: Business as Mediating Institution*. New York: Oxford University Press.
- Frederickson, H. George, and Kevin B. Smith. 2003. *The Public Administration Theory Primer*. Edited by J. Shafritz, *Essentials of Public Policy and Administration*. Boulder: Westview Press.
- Hall, Richard H. 1963. The Concept of Bureaucracy: An Empirical Assessment. *American Journal of Sociology* 69:32-40.
- Henry, Gary T., and Craig S. Gordon. 2003. Driving Less for Better Air: Impacts of a Public Information Campaign. *Journal of Policy Analysis and Management* 22 (1):45-63.
- King, Ronald R. 2002. An Experimental Investigation of Self-Serving Biases in an Auditing Trust Game: The Effect of Group Affiliation. *Accounting Review* 77 (2):265-284.
- Long, J. Scott. 1997. *Models for Categorical and Dependent Variables, Advanced Quantitative*

- Techniques in the Social Sciences*. Thousand Oaks, CA: Sage Publications.
- Long, J. Scott, and J. Freese. 2003. *Regression Models for Categorical Dependent Variables Using Stata*. College Station, TX: State Press.
- Lyon, Thomas P., and John W. Maxwell. 2004. *Corporate Environmentalism and Public Policy*. Cambridge, MA: Cambridge University Press.
- Madden, Richard B. 1980. The Large Business Corporation as Mediating Structure. In *Democracy and Mediating Structures: A Theological Inquiry*, edited by M. Novak. Washington, D.C.: American Enterprise Institute for Public Policy Research.
- Maxwell, John W., Thomas P. Lyon, and Steven C. Hackett. 2000. Self-Regulation and Social Welfare: The Political Economy of Corporate Environmentalism. *The Journal of Law & Economics* 43:583-618.
- May, Peter J. 2003. Marine Facilities and Water Quality. *Coastal Management* 31:297-317.
- Perry, James L. 1997. Antecedents of Public Service Motivation. *Journal of Public Administration Research and Theory* 7 (2):181-197.
- Perry, James L., and Lois Recascino Wise. 1990. The Motivational Bases of Public Service. *Public Administration Review* 50:367-373.
- Potter, Edward E. 2003. Telecommuting: The Future of Work, Corporate Culture, and American Society. *Journal of Labor Research* 24 (1):73-84.
- Prakash, A. 2000. *Greening the Firm: The Politics of Corporate Environmentalism*. Cambridge: Cambridge University Press.
- Reschovsky, Clara. 2004. Journey to Work: 2000: U.S. Census Bureau.
- Schrank, David, and Tim Lomax. 2004. The 2004 Urban Mobility Report. College Station, TX: Texas Transportation Institute.

- Segerson, K., and T. J. Miceli. 1998. Voluntary Environmental Agreements: Good or Bad News for Environmental Protection? *Journal Of Environmental Economics And Management* 36 (2):109-130.
- Stone, Clarence N. 1989. *Regime Politics: Governing Atlanta 1946-1988*. Lawrence: University of Kansas Press.
- TRB. 1995. Expanding Metropolitan Highways: Implications for Air Quality and Energy Use. Washington, DC: Transportation Research Board.
- TRB. 2001. Strategic Highway Research: Saving Lives, Reducing Congestion, Improving Quality of Life. Washington, D.C.: Transportation Research Board.
- U.S. Census Bureau. 2003. American Community Survey Summary Tables. June 28, 2005 http://factfinder.census.gov/servlet/GRTTable?_bm=y&-geo_id=01000US&_box_head_nbr=R04&-ds_name=ACS_2003_EST_G00_&-redoLog=false&-format=US-31&-mt_name=.
- USEPA. 2001. National Air Quality and Emissions Trends Report, 1999. Washington D.C.: U.S. Environmental Protection Agency.
- USEPA. 2003. Ozone: Good Up High, Bad Nearby: U.S. Environmental Protection Agency.
- Vaca, E., and J.R. Kuzmyak. 2005. Traveler Response to Transportation System Changes. Washington, D.C.: Transportation Research Board.
- Weiss, Janet A., and Mary Tschirhart. 1994. Public Information Campaigns as Policy Instruments. *Journal of Policy Analysis and Management* 13 (1):82-119.
- Welch, Eric. W., Allan Mazur, and Stuart Bretschneider. 2000. Voluntary Behavior by Electric Utilities: Levels of Adoption and Contribution of the Climate Challenge Program to the Reduction of Carbon Dioxide. *Journal of Policy Analysis and Management* 19 (3):407-

425.

Wintrobe, Ronald. 1982. The Optimal Level of Bureaucratization Within a Firm. *Canadian Journal of Economics* 15:649-669.

Wolf, J., R. Guensler, L. Frank, and J. Ogle. 2000. The Use of Electronic Travel Diaries and Vehicle Instrumentation Packages in the Year 2000 Atlanta Regional Household Travel Survey: Test Results, Package Configurations, and Deployment Plans. Paper read at 9th International Association of Travel Behaviour Research Conference, at Gold Coast, Queensland, Australia.

Table 1. Descriptive Statistics For Variables in Work Mode Availability Models

| | Mean | Median | Min | Max | Std. Dev. |
|------------------------------------|------|--------|-----|--------|-----------|
| Compressed Work Weeks Availability | 0.40 | 0 | 0 | 2 | 0.60 |
| Flexible Scheduling Availability | 0.98 | 1 | 0 | 2 | 0.68 |
| Teleworking Availability | 0.44 | 0 | 0 | 2 | 0.56 |
| Compressed Work Week Benefits | 5.45 | 6 | 0 | 8 | 2.11 |
| Flexible Scheduling Benefits | 6.06 | 7 | 0 | 8 | 2.02 |
| Teleworking Benefits | 5.48 | 6 | 0 | 8 | 2.30 |
| Procedural Control | 5.69 | 6 | 0 | 9 | 1.73 |
| Employee Autonomy | 1.61 | 2 | 0 | 3 | 0.71 |
| Hierarchy | 4.16 | 4 | 0 | 10 | 2.96 |
| Clean Air Campaign | 0.09 | 0 | 0 | 1 | 0.28 |
| Transportation Mgmt. Assoc. | 0.03 | 0 | 0 | 1 | 0.18 |
| Membership in Both | 0.06 | 0 | 0 | 1 | 0.23 |
| State/Federal Government | 0.05 | 0 | 0 | 1 | 0.21 |
| Size | 472 | 105 | 2 | 23,168 | 1610.51 |

Note: Listwise n=327

Table 2. Descriptive Statistics For Variables in Solo Commute Percentage Model

| | Mean | Median | Min | Max | Std. Dev. |
|--|-------|--------|-----|-----|-----------|
| Solo Commute Percentage | 89.38 | 95 | 0 | 100 | 15.19 |
| Commute Options Benefits | 1.12 | 0 | 0 | 9 | 1.70 |
| Promotion Frequency | 0.44 | 0 | 0 | 6 | 1.05 |
| Commute Alternative Parking Incentives | 0.24 | 0 | 0 | 4 | 0.67 |
| Employee-Paid Parking | 0.15 | 0 | 0 | 1 | 0.36 |
| Time to Park | 0.25 | 0 | 0 | 2 | 0.53 |

Note: Listwise n=322

Table 3. Ordered Probit Results of Compressed Work Week Availability

| | Beta | Robust SE | z | P> z | bStdXY |
|---------------------------|-------|-----------|-------|------|--------|
| Benefits | 0.15 | 0.04 | 4.03 | *** | 0.28 |
| Procedural Control | 0.00 | 0.04 | -0.04 | 0.97 | 0.00 |
| Employee Autonomy | -0.20 | 0.11 | -1.91 | 0.06 | -0.13 |
| Hierarchy | -0.04 | 0.03 | -1.65 | 0.10 | -0.11 |
| Clean Air Campaign | 0.75 | 0.23 | 3.23 | *** | 0.18 |
| Transportation Mgmt Assoc | 0.37 | 0.45 | 0.82 | 0.41 | 0.06 |
| Membership in Both | 0.64 | 0.26 | 2.47 | 0.01 | 0.13 |
| State/Federal Government | 0.48 | 0.32 | 1.52 | 0.13 | 0.09 |
| Size (Employees in 1000s) | 0.13 | 0.05 | 2.50 | 0.01 | 0.18 |

Notes: n=327; McKelvey and Zavoina's $R^2=0.23$; Robust S.E. are White's Heteroskedasticity-
Robust standard errors; "bStdXY" are fully standardized coefficients; ***=p<0.01

Table 4. Ordered Probit Results of Flexible Scheduling Availability

| | Beta | Robust SE | z | P> z | bStdXY |
|-----------------------------|-------|-----------|-------|------|--------|
| Benefits | 0.22 | 0.04 | 5.77 | *** | 0.38 |
| Procedural Control | -0.09 | 0.04 | -2.37 | 0.02 | -0.14 |
| Employee Autonomy | 0.29 | 0.10 | 2.82 | 0.01 | 0.17 |
| Hierarchy | -0.04 | 0.03 | -1.51 | 0.13 | -0.10 |
| Clean Air Campaign | 0.32 | 0.19 | 1.68 | 0.09 | 0.08 |
| Transportation Mgmt. Assoc. | 0.38 | 0.36 | 1.07 | 0.29 | 0.06 |
| Membership in Both | 0.23 | 0.28 | 0.82 | 0.41 | 0.04 |
| State/Federal Government | 0.86 | 0.37 | 2.34 | 0.02 | 0.15 |
| Size (Employees in 1000s) | 0.06 | 0.03 | 2.01 | 0.04 | 0.09 |

Notes: n=327; McKelvey and Zavoina's R2=0.30; Robust S.E. are White's Heteroskedasticity-
Robust standard errors; "bStdXY" are fully standardized coefficients; ***=p<0.01

Table 5. Ordered Probit Results of Telecommuting Availability

| | Beta | Robust SE | z | P> z | bStdXY |
|-----------------------------|-------|-----------|-------|------|--------|
| Benefits | 0.19 | 0.05 | 3.94 | *** | 0.36 |
| Procedural Control | -0.09 | 0.05 | -1.85 | 0.07 | -0.12 |
| Employee Autonomy | 0.31 | 0.10 | 3.16 | *** | 0.18 |
| Hierarchy | 0.01 | 0.03 | 0.20 | 0.84 | 0.01 |
| Clean Air Campaign | 0.70 | 0.19 | 3.61 | *** | 0.16 |
| Transportation Mgmt. Assoc. | 0.28 | 0.36 | 0.77 | 0.44 | 0.04 |
| Membership in Both | 0.18 | 0.28 | 0.63 | 0.53 | 0.03 |
| State/Federal Government | 0.45 | 0.28 | 1.61 | 0.11 | 0.08 |
| Size (Employees in 1000s) | 0.10 | 0.04 | 2.55 | 0.01 | 0.13 |

Notes: n=327; McKelvey and Zavoina's $R^2=0.30$; Robust S.E. are White's Heteroskedasticity-Robust standard errors; "bStdXY" are fully standardized coefficients; ***= $p<0.01$

Table 6. Probability Change of Making Work Mode Available to Some or All Employees By Going From Minimum to Maximum Value of Independent Variable

| | Compressed Work Weeks | Flexible Scheduling | Teleworking |
|-----------------------------|-----------------------|---------------------|-------------|
| Benefits | 0.37 | 0.59 | 0.48 |
| Procedural Control | | -0.21 | -0.30 |
| Hierarchy | -0.15 | | |
| Employee Autonomy | -0.22 | 0.25 | 0.34 |
| Clean Air Campaign | 0.29 | 0.08 | 0.27 |
| Transportation Mgmt. Assoc. | | | |
| Both | 0.19 | | |
| State/Federal Government | | 0.17 | |
| Size (Employees) | 0.69 | 0.20 | 0.61 |

Note: Shaded areas indicate statistically insignificant variables

Table 7. Tobit Model of Solo Commute Percentages

| | Beta | Robust s.e. | z | P> z | bStdXY | SDofX |
|--|-------|-------------|--------|------|--------|-------|
| Commute Options Benefits | -2.49 | 0.79 | -3.18 | *** | -0.56 | 1.70 |
| Promotion Frequency | -1.92 | 0.98 | -1.96 | 0.05 | -0.27 | 1.05 |
| Commute Alternative Parking Incentives | 0.78 | 1.16 | 0.67 | 0.50 | 0.07 | 0.67 |
| Employee-Paid Parking | -3.74 | 2.92 | -1.28 | 0.20 | -0.18 | 0.36 |
| Time to Park | -3.85 | 1.87 | -2.07 | 0.04 | -0.27 | 0.53 |
| Constant | 94.50 | 0.79 | 119.36 | *** | | |

Notes: n=322; Beta=Tobit coefficient; Robust s.e.=White's heteroskedasticity robust standard error; bStdXY=fully standard coefficients; SDofX=standard deviation of X; n=329; Chi²=80.67; SDofY=15; ***=p<0.01

Table 8. Ordinal Probit Results of Commute Alternative Work Modes

| | Compressed Work Weeks | | Flextime | | Teleworking 1 | |
|---------------------------------------|-----------------------|-----|----------|-----|---------------|-----|
| | Beta | Sig | Beta | Sig | Beta | Sig |
| Benefits | 0.15 | *** | 0.22 | *** | 0.19 | *** |
| Procedural Control | 0.00 | | -0.09 | ** | -0.09 | * |
| Employee Autonomy | -0.20 | * | 0.29 | ** | 0.31 | *** |
| Hierarchy | -0.04 | * | -0.04 | | 0.01 | |
| Clean Air Campaign | 0.75 | *** | 0.32 | * | 0.70 | *** |
| Tranportation Mgmt. Assoc. | 0.37 | | 0.38 | | 0.28 | |
| Membership in Both | 0.64 | ** | 0.23 | | 0.18 | |
| State/Federal Government | 0.48 | | 0.86 | ** | 0.45 | |
| Size (Employees in 1000s) | 0.13 | ** | 0.06 | ** | 0.10 | ** |
| n | 319 | | 319 | | 319 | |
| McKelvey and Zavoina's R ² | 0.23 | | 0.30 | | 0.30 | |

Note: *** = p<0.01; **=p<0.05;*=p<0.10; Shaded=p>0.10

Table 1. Descriptive Statistics For Variables in Work Mode Availability Models

| | Mean | Median | Min | Max | Std. Dev. |
|------------------------------------|------|--------|-----|--------|-----------|
| Compressed Work Weeks Availability | 0.40 | 0 | 0 | 2 | 0.60 |
| Flexible Scheduling Availability | 0.98 | 1 | 0 | 2 | 0.68 |
| Teleworking Availability | 0.44 | 0 | 0 | 2 | 0.56 |
| Compressed Work Week Benefits | 5.45 | 6 | 0 | 8 | 2.11 |
| Flexible Scheduling Benefits | 6.06 | 7 | 0 | 8 | 2.02 |
| Teleworking Benefits | 5.48 | 6 | 0 | 8 | 2.30 |
| Procedural Control | 5.69 | 6 | 0 | 9 | 1.73 |
| Employee Autonomy | 1.61 | 2 | 0 | 3 | 0.71 |
| Hierarchy | 4.16 | 4 | 0 | 10 | 2.96 |
| Clean Air Campaign | 0.09 | 0 | 0 | 1 | 0.28 |
| Transportation Mgmt. Assoc. | 0.03 | 0 | 0 | 1 | 0.18 |
| Membership in Both | 0.06 | 0 | 0 | 1 | 0.23 |
| State/Federal Government | 0.05 | 0 | 0 | 1 | 0.21 |
| Size | 472 | 105 | 2 | 23,168 | 1610.51 |

Note: Listwise n=327

Table 2. Descriptive Statistics For Variables in Solo Commute Percentage Model

| | Mean | Median | Min | Max | Std. Dev. |
|--|-------|--------|-----|-----|-----------|
| Solo Commute Percentage | 89.38 | 95 | 0 | 100 | 15.19 |
| Commute Options Benefits | 1.12 | 0 | 0 | 9 | 1.70 |
| Promotion Frequency | 0.44 | 0 | 0 | 6 | 1.05 |
| Commute Alternative Parking Incentives | 0.24 | 0 | 0 | 4 | 0.67 |
| Employee-Paid Parking | 0.15 | 0 | 0 | 1 | 0.36 |
| Time to Park | 0.25 | 0 | 0 | 2 | 0.53 |

Note: Listwise n=322

Table 3. Ordered Probit Results of Compressed Work Week Availability

| | Beta | Robust SE | z | P> z | bStdXY |
|---------------------------|-------|-----------|-------|------|--------|
| Benefits | 0.15 | 0.04 | 4.03 | *** | 0.28 |
| Procedural Control | 0.00 | 0.04 | -0.04 | 0.97 | 0.00 |
| Employee Autonomy | -0.20 | 0.11 | -1.91 | 0.06 | -0.13 |
| Hierarchy | -0.04 | 0.03 | -1.65 | 0.10 | -0.11 |
| Clean Air Campaign | 0.75 | 0.23 | 3.23 | *** | 0.18 |
| Transportation Mgmt Assoc | 0.37 | 0.45 | 0.82 | 0.41 | 0.06 |
| Membership in Both | 0.64 | 0.26 | 2.47 | 0.01 | 0.13 |
| State/Federal Government | 0.48 | 0.32 | 1.52 | 0.13 | 0.09 |
| Size (Employees in 1000s) | 0.13 | 0.05 | 2.50 | 0.01 | 0.18 |

Notes: n=327; McKelvey and Zavoina's $R^2=0.23$; Robust S.E. are White's Heteroskedasticity-
Robust standard errors; "bStdXY" are fully standardized coefficients; ***=p<0.01

Table 4. Ordered Probit Results of Flexible Scheduling Availability

| | Beta | Robust SE | z | P> z | bStdXY |
|-----------------------------|-------|-----------|-------|------|--------|
| Benefits | 0.22 | 0.04 | 5.77 | *** | 0.38 |
| Procedural Control | -0.09 | 0.04 | -2.37 | 0.02 | -0.14 |
| Employee Autonomy | 0.29 | 0.10 | 2.82 | 0.01 | 0.17 |
| Hierarchy | -0.04 | 0.03 | -1.51 | 0.13 | -0.10 |
| Clean Air Campaign | 0.32 | 0.19 | 1.68 | 0.09 | 0.08 |
| Transportation Mgmt. Assoc. | 0.38 | 0.36 | 1.07 | 0.29 | 0.06 |
| Membership in Both | 0.23 | 0.28 | 0.82 | 0.41 | 0.04 |
| State/Federal Government | 0.86 | 0.37 | 2.34 | 0.02 | 0.15 |
| Size (Employees in 1000s) | 0.06 | 0.03 | 2.01 | 0.04 | 0.09 |

Notes: n=327; McKelvey and Zavoina's R2=0.30; Robust S.E. are White's Heteroskedasticity-
Robust standard errors; "bStdXY" are fully standardized coefficients; ***=p<0.01

Table 5. Ordered Probit Results of Telecommuting Availability

| | Beta | Robust SE | z | P> z | bStdXY |
|-----------------------------|-------|-----------|-------|------|--------|
| Benefits | 0.19 | 0.05 | 3.94 | *** | 0.36 |
| Procedural Control | -0.09 | 0.05 | -1.85 | 0.07 | -0.12 |
| Employee Autonomy | 0.31 | 0.10 | 3.16 | *** | 0.18 |
| Hierarchy | 0.01 | 0.03 | 0.20 | 0.84 | 0.01 |
| Clean Air Campaign | 0.70 | 0.19 | 3.61 | *** | 0.16 |
| Transportation Mgmt. Assoc. | 0.28 | 0.36 | 0.77 | 0.44 | 0.04 |
| Membership in Both | 0.18 | 0.28 | 0.63 | 0.53 | 0.03 |
| State/Federal Government | 0.45 | 0.28 | 1.61 | 0.11 | 0.08 |
| Size (Employees in 1000s) | 0.10 | 0.04 | 2.55 | 0.01 | 0.13 |

Notes: n=327; McKelvey and Zavoina's $R^2=0.30$; Robust S.E. are White's Heteroskedasticity-Robust standard errors; "bStdXY" are fully standardized coefficients; ***=p<0.01

Table 6. Probability Change of Making Work Mode Available to Some or All Employees By Going From Minimum to Maximum Value of Independent Variable

| | Compressed Work Weeks | Flexible Scheduling | Teleworking |
|-----------------------------|-----------------------|---------------------|-------------|
| Benefits | 0.37 | 0.59 | 0.48 |
| Procedural Control | | -0.21 | -0.30 |
| Hierarchy | -0.15 | | |
| Employee Autonomy | -0.22 | 0.25 | 0.34 |
| Clean Air Campaign | 0.29 | 0.08 | 0.27 |
| Transportation Mgmt. Assoc. | | | |
| Both | 0.19 | | |
| State/Federal Government | | 0.17 | |
| Size (Employees) | 0.69 | 0.20 | 0.61 |

Note: Shaded areas indicate statistically insignificant variables

Table 7. Tobit Model of Solo Commute Percentages

| | Beta | Robust s.e. | z | P> z | bStdXY | SDofX |
|--|-------|-------------|--------|------|--------|-------|
| Commute Options Benefits | -2.49 | 0.79 | -3.18 | *** | -0.56 | 1.70 |
| Promotion Frequency | -1.92 | 0.98 | -1.96 | 0.05 | -0.27 | 1.05 |
| Commute Alternative Parking Incentives | 0.78 | 1.16 | 0.67 | 0.50 | 0.07 | 0.67 |
| Employee-Paid Parking | -3.74 | 2.92 | -1.28 | 0.20 | -0.18 | 0.36 |
| Time to Park | -3.85 | 1.87 | -2.07 | 0.04 | -0.27 | 0.53 |
| Constant | 94.50 | 0.79 | 119.36 | *** | | |

Notes: n=322; Beta=Tobit coefficient; Robust s.e.=White's heteroskedasticity robust standard error; bStdXY=fully standard coefficients; SDofX=standard deviation of X; n=329; Chi²=80.67; SDofY=15; ***=p<0.01

Table 8. Ordinal Probit Results of Commute Alternative Work Modes

| | Compressed Work Weeks | | Flextime | | Teleworking 1 | |
|---------------------------------------|-----------------------|-----|----------|-----|---------------|-----|
| | Beta | Sig | Beta | Sig | Beta | Sig |
| Benefits | 0.15 | *** | 0.22 | *** | 0.19 | *** |
| Procedural Control | 0.00 | | -0.09 | ** | -0.09 | * |
| Employee Autonomy | -0.20 | * | 0.29 | ** | 0.31 | *** |
| Hierarchy | -0.04 | * | -0.04 | | 0.01 | |
| Clean Air Campaign | 0.75 | *** | 0.32 | * | 0.70 | *** |
| Tranportation Mgmt. Assoc. | 0.37 | | 0.38 | | 0.28 | |
| Membership in Both | 0.64 | ** | 0.23 | | 0.18 | |
| State/Federal Government | 0.48 | | 0.86 | ** | 0.45 | |
| Size (Employees in 1000s) | 0.13 | ** | 0.06 | ** | 0.10 | ** |
| n | 319 | | 319 | | 319 | |
| McKelvey and Zavoina's R ² | 0.23 | | 0.30 | | 0.30 | |

Note: *** = p<0.01; **=p<0.05;*=p<0.10; Shaded=p>0.10