Trip Reduction Incentives: Gender Differences and Policy Implications

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ABSTRACT

The social science literature in transportation identifies a number of gender differences in the commuting behaviors of men and women. Women tend to make more trips related to family needs, and they also travel more than do men overall, particularly between the ages of 24 and 54—the prime child rearing and family development years. This suggests that men and women may respond to and be affected differently by incentive programs used by employers to reduce the number of trips made and vehicle miles traveled by workers. Knowledge of these differences, and identification of programs that have been particularly responsive to women's needs, would be useful to community transportation planners, transit authorities, and companies attempting to meet requirements for trip reduction.

The environmental literature provides a number of recommendations for the design of programs aimed at changing behaviors that adversely affect the environment. In general, this literature has not been integrated with the transportation management literature. This paper provides some lessons learned from the environmental literature and examines their applicability to the Washington State Commute Trip Reduction Program. It describes the incentives and sanctions used by employers in Washington State to encourage their staff to reduce trips to work and the evaluation activities undertaken to assess the success of the program and the impacts on male and female employees of the trip reduction program. It presents results of discussions with employers and transit authorities about the availability and need for information about the differential effectiveness of various incentives and the policy implications of these findings. The paper provides an assessment framework derived from recent developments in environmental management and assessment and utilizes data collected from employees in Washington State as part of the Washington State Trip Reduction Program, along with data from a ten-year series of telephone surveys of representative samples of frequent, infrequent, and nonriders of public transportation in the Seattle metropolitan area. The analysis discusses gender differences in the use/nonuse of trip reduction incentives and in the relative attractiveness of various alternatives to single-person, daily car commuting to work. The paper also presents preliminary information about the degree of awareness and response to gender and other social group differences in the effectiveness/desirability of trip reduction incentives by employers' transportation coordinators in the Puget Sound area.

> "Commuting, like all passenger travel, is a social phenomenon, an economic phenomenon and a technological phenomenon." (Pisarski 1996: 1)

> "In 1977 Harvey Brooks...pointed out that long-term environmental problems pose a special challenge to humanity. Even if the *causes* of environmental problems such as the greenhouse effect could be easily understood, their cure would be difficult when—as is often the case—we have become committed in ways both deep and complex to the activities that cause these problems....The obstacles to a sustainable society are hard and heavy, and the levers short and frail. Learning how to move those obstacles is the first step." (Lee 1993:5, xii.)

> "Unfortunately travel reduction and environmental programs are constructed to attempt to reduce societal costs without any meaningful attempt to offset personal benefits lost." (Rosenbloom and Burns 1993).
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> "To the greatest extent practicable and permitted by law...each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations...." (Executive Order 12898 on Environmental Justice, February 11, 1994).

INTRODUCTION

This paper focuses on the Commute Trip Reduction (CTR) program in Washington State, with particular attention to King County, one of the eight counties subject to the Washington State CTR regulations. It discusses the design, implementation, and consequences of this program from the perspective of emerging standards of practice and lessons learned from environmental assessment and natural resource management, with the goal of providing a bridge between the transportation management and environmental management literature. By looking at the structure and processes of the program and at available data documenting its implementation in King County, it assesses the potential for the CTR program to cause disproportionate impacts on women. To avoid redundancy it takes as a starting point, rather than a focus of investigation, the well-documented findings in literature that a wide variety of social and demographic attributes, including gender, affect commuting behavior and transportation choices. These attributes can affect choices and opportunities in ways that can result in disproportionate allocation of benefits and costs and unintended adverse impacts on families and communities when policies such as travel demand management are implemented (Meyerhoff et al. 1993; McLafferty and Preston 1991).

Inequities and unintended consequences between genders or between employees with young children and those without often occur because program planners do not understand or take into account socially established patterns of responsibilities, constraints and resource limitations that shape individual behaviors or do not provide opportunities for potentially affected groups to participate in the design of the program. Of particular salience to this discussion is the well-documented finding that child- and elder-care and household maintenance responsibilities, predominantly still fulfilled by women, make it more difficult and costly to switch from single occupant vehicles to other modes of transport (Rosenbloom and Burns 1993; Rosenbloom and Burns 1994; Wachs 1988; McLafferty and Preston 1991). In addition, other attributes such as single parenting and low-wage jobs that make any monetary or time costs imposed by such policies more impactful also tend to be disproportionately associated with women and minorities (Guiliano 1979; McLafferty and Preston 1991; Pas 1984; Meyerhoff et al. 1993; Rosenbloom and Burns 1993).

The increased attention to environmental impacts and intensified efforts to regulate activities that affect the environment reflect an emerging realization that science and technology, combined with a growing human population, have the potential to transform the world. A growing body of environmental management and impact assessment literature joins the policy analysis literature in emphasizing the difficulty of predicting the outcomes of environmental policy or management initiatives and stressing the importance of monitoring, evaluation, and modification as a way of compensating for this difficulty (Holling 1978; Lee 1993; Ostrom 1990; Renn et al. 1995). This literature also highlights the importance of addressing organizational issues and incentive/ disincentive structures when designing programs or implementing policies to address environmental problems or achieve environ-

mental goals. It increasingly emphasizes that effective program design must give careful consideration to equity, acceptability, administrative feasibility and unintended social consequences (Branch et al. 1984; Kasperson and Dow 1991; Sachs 1995; Lach et al. 1994; Bradbury et al. 1994). Environmental literature highlights the importance of public involvement and participation in the design of programs and selection among alternatives in order to identify and avoid adverse social and environmental consequences and enhance acceptability and implementability (Holling et al. 1978; Lee 1993; Carley and Christie 1993; Nugent 1996; Bradbury et al. 1994; Hildebrand and Cannon 1993; Renn et al. 1995).

The emergence of the grassroots environmental justice movement in the mid-1990s has drawn particular attention to the need to consider the distributional consequences of environmental policies and practices by challenging the fairness or equity of how environmental hazards, burdens, and benefits are distributed across various populations (Bullard 1990; Capek 1992; Davis and Bailey 1996; Lach et al. 1994). The environmental justice movement focuses primarily on the disproportionate imposition of impacts from environmental hazards to minority and low-income populations and has raised awareness of a significant social problem. However, social impact assessment, a component of environmental impact assessment, has long identified the need to consider how environmental policies and decisions may differentially affect any social or stakeholder groups (Branch et al. 1984; Hildebrand and Cannon 1993).

The objectives of the Washington CTR program are to reduce the number of trip miles and single occupant vehicles to and from work, reduce congestion, and reduce peak hour travel. The principal impetus for the CTR program is environmental; important supporting considerations are economic and public satisfaction/quality of life. Differences in program characteristics and employee attributes affecting transportation choices create the potential for CTR program benefits, costs, and consequences to be differentially distributed among social groups in ways that are socially significant at both the individual and societal level (Rosenbloom and Burns 1993; Stewart 1994).

As described in greater detail below, those designing and involved in the early implementation of the Washington CTR program gave a great deal of attention to gaining the support and acceptance of the affected employers. To its credit, the Washington CTR program includes an extensive program evaluation and monitoring component, and specific arrangements for knowledgeable technical assistance and support. However, in a review of program documents and exploratory interviews with a limited number of program participants, we found little evidence that employers' trip reduction programs had been designed or were being evaluated with specific attention to the needs and issues of different social groups. There was little indication that issues of equity in the distribution of costs and benefits across employees or employee groups, such as women, or adverse unintended social and community consequences of trip reduction and transportation demand management policies and programs, had been a focus of attention by policymakers, the governmental agencies providing technical assistance, or employers and their employer transportation coordinators. More attention had been paid to the potential for differential impacts on employers (Dodds nd; Egan nd; Johnson nd).

The goal of programs such as the Washington CTR is to encourage changes in commuting behavior in ways that prevent harmful environmental degradation by eliciting sufficient change efficiently and with minimum social cost. To be successful the behavioral changes must occur without intrusive regulations that restrict individual freedom of choice and inequitable distribution of costs. The laudable goal of protecting the environment has no simple solution. Efforts must be made and responsibility shared between individuals, businesses, and government agencies alike. It is important to capture information from programs such as the Washington CTR so that subsequent programs can benefit from this experience.

This paper describes some of the innovative and positive efforts being undertaken in Washington State and particularly King County to implement an effective and flexible program that achieves trip reduction goals while supporting workers in meeting their community and family responsibilities and preventing an increase in social inequities. It presents the results of interim evaluation studies of the King County program and identifies aspects of the program that deserve greater attention and study. The paper is organized as follows: Section 2 describes the approach and methods used in this paper, and presents a brief review of the environmental management, assessment literature and some lessons from this literature that seem pertinent for our examination of the Washington CTR program. Section 3 describes the Washington State approach to CTR, with specific attention to the King County Program and some of the innovative programs developed by collaboration between the County and individual work sites. Section 4 describes the monitoring and evaluation components of the state program and presents data on the use of CTR options at affected King County work sites. Section 5 summarizes our conclusions and offers some recommendations for the program. Section 6 suggests some areas for additional research.

APPROACH AND METHODS

ENVIRONMENTAL ASSESSMENT AND MANAGEMENT: A FRAMEWORK FOR EXAMINING THE WASHINGTON CTR PROGRAM

A growing body of literature is devoted to the methods and results of efforts to develop and implement effective strategies for managing nonmarket, shared resources such as clean air or clean water, maintaining or promoting environmentally responsible behaviors, and assessing the complex consequences of environmental and resource management strategies and policies (Edwards 1987; Ostrom 1990; Hardin 1968; Hildebrand and Cannon 1993). Tremendous effort has been exerted to design programs that reduce or eliminate environmentally destructive behaviors broadly and quickly enough to protect the environment. There is widespread agreement that it is highly preferable to achieve these goals through voluntary actions, since this preserves freedom of choice, an important component of social well-being, and enhances flexibility, a key requirement for successfully addressing complex problems.

However, there are questions about whether voluntary programs, driven by regulatory requirements rather than market forces, can achieve the behavioral changes needed to protect the environment. A widespread goal is to avoid the situation in which quality of life is doubly reduced—by both environmental degradation and the imposition of draconian measures that limit individual freedom and choice. The difficulty of achieving these goals of protecting shared, nonmarket resources has received a great deal of attention in environmental literature (Edwards 1987; Holling 1978; Ostrom 1990; Kolluru 1944).

Review of environmental management and impact assessment literature identified five approaches that offer guidance applicable to the design and evaluation of programs such as the Washington Commute trip Reduction (CTR) initiative: Adaptive management; strategic environmental management; environmental impact assessment; research on conservation behavior and environmental values; and environmental equity. Each of these is discussed briefly below, and contributes to a set of lessons that appear pertinent to examination of the Washington State CTR program.

Adaptive Management

Adaptive management emphasizes the need to employ an experimental approach in designing environmental policies and management initiatives. It acknowledges the complexity of the natural and social systems and advocates designing interventions and monitoring/data gathering efforts specifically to

gain knowledge and understanding that can be used to improve management approaches and policies. An important principle of adaptive management is flexibility—setting outcome goals, but providing flexibility in the means for achieving those goals. Among the key advocates of adaptive management are Holling et al. (1978) and Lee (1993), who have written extensively about the requirements and difficulties of adaptive management.

Strategic Environmental Management

Strategic environmental management is an approach emerging in private industry and government agencies that emphasizes the benefits of addressing environmental issues proactively, rather than as a matter of compliance with environmental regulations, and systematically incorporating consideration of environmental consequences into key decisions at all levels of an organization. It stresses integration, analysis, priority setting, and attention to issues of implementation, evaluation, and learning (Kolluru 1994; Wever 1966). Strategic environmental management focuses on developing an integrated set of analytic techniques that agencies or companies can employ to ensure the effectiveness and efficiency of environmental management practices. Strategic environmental management also emphasizes the importance of attending to issues of organizational effectiveness, such as the location of environmental authority and initiative within the agency or company, and the value of incorporating findings from organizational and management research in the design and implementation of environmental policies. Evaluations of environmental management initiatives often identify organizational and management characteristics as among the most critical in determining program success or failure (Kolluru 1994).

Environmental Impact Assessment

Environmental impact assessment, including social impact assessment, was codified into the U.S. system with the passage of the National Environmental Policy Act in 1970. Social impact assessment, though applied unevenly, attempts to identify and evaluate the distributional and system effects of environmental policies and proposed projects on individuals, social groups, and communities. It stresses the importance of providing opportunities for those potentially affected by the policy or program to be informed and involved in the design, evaluation, and decision-making process, and emphasizes the importance of understanding the social processes that distribute impacts to different groups. It also emphasizes the power of perception, values and process, and the consequences of gaining acceptance and support rather than opposition and resistance to the outcomes of policies and programs. Social impact assessment also attempts to address the impacts of environmental policies and development projects on "quality of life," though the effectiveness of these efforts has been questioned (Branch et al. 1984; Burdge 1994; Hildebrand and Cannon 1993; Andrews 1986; EPA 1973). To date, social and environmental impact assessment have generally not focused on the environmental consequences of changing human demographics and behaviors that occur as secondary effects of environmental policies or programs.

Behavioral Research

Despite considerable research on methods to promote and reinforce environmentally responsible behaviors, programs that aim to influence and, ultimately, change human behaviors produce mixed results. In part, the lack of consistency is due to the absence of a conceptual model that links values, beliefs, motivations, information, and behavior. For instance, studies trying to link environmental values to concrete behaviors typically find that even persons who are the most pro-environmental do not consistently behave in ways that have positive benefits to the environment.

Recent theoretical and empirical work view pro-environmental behaviors as part of a system connecting values (personal and environmental) with motivation, information, and social context. Especially critical is the notion of "conservation competence" (DeYoung 1989; Corral-Verdugo 1996; Vining and Ebreo 1990). Conservation competence focuses on provision of relevant information and support services, within a particular context, that make it easier for a behavior to be carried out. For instance, recycling behaviors are much more likely to be undertaken and to become habitual when people are provided with recycling containers and when they live in single-family neighborhoods where their friends and neighbors also recycle (and presumably where their behaviors are "on view"). Monetary incentives, on the other hand, have proven to be less successful in making long-term changes in behavior: once the incentive is removed, the behavior often is not maintained.

Behavior change is also more likely to take place among people who already have positive environmental values and who are intrinsically motivated to behave in a pro-environmental manner. As an example, studies have found that people increasingly view recycling as "biospheric altruism" (Thogersen 1996) and that they thus view recycling behaviors as falling within the realm of ethics and morality. These behaviors then become powerful motivators of other pro-environmental behaviors. In implementing a pro-environmental program, this research emphasizes that attention needs to be paid to both the introduction phase and the maintenance phase of the behavioral change. Information and support services may be particularly important for initial changes in behavior, whereas the social context and environmental values may be especially critical in maintaining the behavioral change over time. Highlighting the environmental value of the sought-after behaviors can help reinforce participation in programs such as trip reduction and recycling.

Environmental Equity and Justice

In addition to adverse impacts on the natural environment, there is growing evidence and concern about human health impacts and their distribution across different populations. As synthesized by Lach et al. (1994), environmental equity refers to the distribution of environmental hazards, burdens and benefits across populations, and is frequently discussed in terms of social equity (the distribution of environmental impacts across social groups defined by such attributes as income, social class, ethnic status, gender, age and family characteristics); geographic equity (the spatial distribution of benefits, risks and impacts); and inter-generational equity (the distribution of potential impacts across present and future generations). In addition to the distribution of impacts or outcomes, environmental equity is also concerned with the level of procedural equity in the decision-making processes that lead to these differential allocations. Environmental justice is the goal of a grassroots social movement that is concerned with both environmentalism and social justice.

As articulated by Lach et al. (1994), the issue of fairness in the allocation of resources and the processes for distributing resources is the central focus of discussions about environmental equity and social justice. The environmental equity and justice literature identifies three principal bases for achieving fairness in the allocation of resources: (a) an equitable distribution that allocates resources based on relative input; (b) an equal distribution that allocates resources equally among all involved regardless of input; and (c) a needs-based distribution that apportions resources to those who have the greatest requirements for survival. Although the characteristics of a fair process or procedure are less well established, the following components are often suggested:

- All affected participants are identified and represented in discussions about the distribution;
- Participants perceive that everyone is acting in 'good faith' and willing to work together;
- Participants have access to all available information;

- Procedures are used consistently; and
- Procedures, rules, and guidelines are flexible and adaptable to the circumstances.

As with strategic environmental management and social impact assessment, the environmental equity discussion emphasizes the importance of the organizational location of decision-making and control and the openness of the design and decision-making process. Access to information and the ability to influence decisions that affect them through a process of public information, participation and involvement in the planning and decision-making processes has been identified as a requirement of both formal environmental regulations and environmental management approaches. Monitoring and evaluation are seen as important tools to provide evidence of the achievement of fair processes and outcomes.

Pertinent Lessons from the Environmental Management Literature

Based on review of this literature associated with these five environmental approaches, we suggest the following as lessons learned from consideration of the design and implementation of environmental management programs that are pertinent for examining the Washington CTR program:

- Recognize the complexity of social and natural systems and design interventions as experiments. Incorporate monitoring and evaluation as key components of the program and be prepared to modify the program in response to what is learned from this information. Lee (1993) emphasizes the importance of capitalizing on every opportunity to gain greater understanding and data that can be used to improve environmental management efforts. This requires an emphasis on monitoring and evaluation, and of effective sharing and use of monitoring and evaluation information.

- Set outcome goals but avoid prescribing how they are to be achieved. Design flexibility into the program. This allows for flexibility to accommodate local and changing circumstances and for taking advantage of learning and innovation and is a central tenant of adaptive management.

- Analyze system characteristics and relationships. Identify key relationships that influence program design.

- All five approaches emphasize the importance of identifying the significant connections between and within parts of the system under examination. Rosenbloom and Burns (1993), for example, point out that one of the reasons that CTR programs have had limited success is that they do not address key factors driving the use of single occupancy vehicles by working women: child-care and household maintenance responsibilities.

- Inform and involve stakeholders and the public. Take a collaborative approach. Effective interaction with stakeholders and provision of information and opportunities for involvement to the general public are emphasized as critical for success in all five approaches, both because such involvement increases acceptability and support for the initiative and because it provides critical information to program implementors.

- Where possible, provide for voluntariness, which increases acceptability and reduces perceptions of risk. Provide multiple options to increase opportunities for choice.

There is substantial literature that clearly demonstrates the positive effect of voluntariness on acceptability and perceptions of safety and risk. For these reasons, it is generally considered preferable, where possible, to achieve environmental goals through voluntary compliance rather than the imposition of prescriptive regulations.

- Address distributional and equity issues.

  Both the environmental literature and social policy literature emphasize the importance of assessing the distributional and equity consequences of programs and policies, although the environmental justice movement demonstrates that this is often not done effectively. Failure to address these issues can jeopardize the credibility and acceptability of the program or policy and can lead to serious adverse social (and political) costs.

- Recognize that organizational aspects influence outcomes.

  Although the importance of organizational and management effectiveness is widely known and accepted, circumstances often lead to inattention to these aspects of program design and implementation. Program proponents and supporters are often not in a position to evaluate or address organizational and management problems.

- Provide accountability and feedback.

  Achieving behavioral change is difficult and requires information, feedback, and accountability, facts noted in all five environmental management approaches. This requires establishment of appropriate data collection and accounting procedures, as well as appropriate organizational and institutional relationships.

- Recognize and address the fundamentals of behavioral change.
  This includes the relationship between values and behavior, the benefits of encouraging incremental change, and the need to provide reinforcement of desired behaviors.

METHODS AND DATA

To help frame the question and determine what information was already available and well-established concerning gender issues in commute trip reduction, the authors conducted a literature search and review. Given the extent of research and strength of evidence in the literature about women's travel patterns and their continuing disproportionate responsibility for caregiving and household maintenance, and the limited information available about the design and impacts of commute trip reduction programs, we focused our attention on developing a set of lessons learned from the environmental management literature, describing the characteristics of the Washington State and King County Commute trip Reduction Programs, analyzing data from the first two rounds of surveys of employers and employees in King County, and gathering information about the organizational dynamics of program design and implementation. Information about the Washington State and King County programs was assembled from available sources, employee surveys and interviews with a limited number of program administrators, transportation consultants, and employee transportation coordinators at programs identified as successful in meeting the CTR target goals.

To gather more descriptive, process, and evaluative data and to help us validate the pertinence of the lessons derived from the environmental management literature, the authors interviewed key King

County transportation planners, transportation consultants active in King County, and a dozen CTR representatives of local companies that were succeeding in meeting their program goals. These interviews focused on identifying successful programs and learning about the internal workings of the CTR program. We asked how the programs had been initiated, what key objectives they had set out to accomplish, and whether they thought their strategies had been or were going to be successful. To determine whether the special needs of women had been specifically taken into consideration in the design of the program at the state, county, or company level, we asked the respondents about their familiarity with data on women's travel patterns and whether the needs of different employee groups had been specifically taken into consideration in the design of the program, with a special query about the needs of those with primary responsibility for children and elders. We asked who participated in the development of the CTR program, and whether they had any data indicating whether certain incentives were more or less appealing to certain groups of employees. Given the small and opportunistic nature of the sample of interviewees, the information we gained from this process is considered suggestive and exploratory, providing context for interpretation of the employee survey data and consideration of the applicability of the lessons learned from the environmental management literature. It also supports our conclusions about research needs.

A particularly pertinent finding with implications for research and the availability of data in this area was the reluctance of employers to: (1) specifically plan programs to meet the needs of particular employee groups; (2) identify programs as beneficial to a particular group of employees; or (3) collect data that would imply or encourage analysis along these lines. Neither the state nor the county asks for gender information in its annual surveys. None of those interviewed indicated that they had designed or designated components of their program to be beneficial to or particularly considerate of women (or any other particular group). Those who acknowledged awareness of these issues indicated that their programs were intentionally kept "gender neutral." That is, no emphasis was placed on alternatives that might be more appealing to women employees with primary domestic responsibilities. One rationale for this position was that the work force increasingly includes men who also assume domestic responsibilities. Another rationale is concern about possible claims of discrimination. Some CTR representatives were concerned (or had been so advised by legal counsel in some instances) that their companies might subject themselves to claims of discrimination if their programs offered primary caretakers options not available to others in the company. Title VII civil rights laws, as interpreted, require that any such policies be gender-neutral on their face.[2] As a result of these considerations, the ability to analyze the distribution of costs and benefits of the CTR programs across social groups, including gender, is severely limited.

THE WASHINGTON STATE APPROACH TO COMMUTE TRIP REDUCTION

This section describes the legislation and program characteristics and the roles and responsibilities of the key components and participants in the state program. It also provides a brief description of the King County program, including a brief sketch of two innovative trip reduction programs: the Preston Vanpool program and the U-Pass program at the University of Washington.

LEGISLATION AND PROGRAM CHARACTERISTICS

The Washington State Legislature adopted the Commute Trip Reduction (CTR) law and incorporated it into the State's Clear Air Act in 1991. The legislature found that automotive traffic in Washington metropolitan areas was the major source of emissions of air contaminants, which cause significant harm to public health and degrade the quality of the environment, and took steps to correct the problem (RCW 70.94.521). The premise of the law is that congestion and air pollution can be

reduced when people reduce their numbers of single-occupant-vehicle commutes (SOVs) as well as vehicle miles traveled (VMTs). This is important in Washington State, where, according to the King County Department of Transportation, " [t]raffic congestion and the resulting air pollution cost nearly $1 billion annually in related health problems and lost productivity in the State of Washington." (Municipality of Metropolitan Seattle 1993:A3).

The CTR program receives funds from the State Air Pollution Account, a dedicated user-fee account. These funds are specifically designated for use to support statewide implementation and assistance to counties, cities, and towns implementing CTR plans and ordinances.[3] Although not required by federal law when passed, the CTR program represented an effort by the State of Washington to improve air quality, reduce traffic congestion, and decrease transportation-related fuel consumption before federal laws were imposed. This was particularly important in the Puget Sound region, which, according to a regional transportation report, had the 20th largest population base in the United States and the sixth worst highway traffic congestion. The State had concluded that the costs of fully accommodating traffic on roads and highways were prohibitive and that decreasing the demand for vehicle trips through an employer-based program represented a significantly less costly and at least as effective method for reducing traffic congestion. The CTR law was passed during a time when policymakers and citizens were engaged in a number of public discussions about how the region could manage continued growth while maintaining the regions valued quality of life.

The state law applies to employers with 100 or more full-time employees at a single worksite who begin their scheduled work day between 6 a.m. and 9 a.m. (with exemptions for some higher education employees, seasonal employees, and most construction worksites) in the eight Washington counties with populations over 150,000: Clark, King, Kitsap, Pierce, Snohomish, and Spokane. Figure 1 shows the eight affected counties [map from Merchant 1995—1995 report to the Washington State Legislature: 1]. The law established a goal of reducing single occupant vehicle rates and vehicle miles traveled per person at affected worksites by 15 percent by 1995, 25 percent by 1997 and 35 percent by 1999, compared to the 1992 baseline rate for the zone[4] in which the worksite is located. (Johnson nd.)

As noted in the *1995 Report to the Washington State Legislature*, "[u]nlike mandatory trip reduction programs established in other states through federal air pollution regulations, Washington's program relies on a collaborative partnership between the public and private sectors to make positive progress toward these goals." The program calls upon affected employers to make good faith efforts to achieve the CTR goals, and requires them to measure progress by surveying their employees in 1995, 1997, and 1999, if not more frequently. The structure of the program and the focus of the support activities emphasize flexibility and voluntariness, both with regard to the relationship between the program and the employers and between the employers and their employees. Support materials and technical assistance are provided to encourage employers to develop programs that provide a wide selection of options among which employees may choose.

PROGRAM ROLES AND RESPONSIBILITIES

Employer CTR Responsibilities

Reflecting this framework of flexibility and voluntariness, the law requires affected employers to: (a) appoint and identify an Employee Transportation Coordinator (ETC); (b) develop and implement measures to reduce single occupant commuting; (c) distribute information on alternative commute modes to affected employees; (d) conduct biennial employee commute surveys; and (d) report

progress annually. The law also requires affected employers to conduct an employee survey and establish base year single-occupant vehicle (SOV) and vehicle miles traveled (VMT) rates. Two of the program's most important short-term goals were to gain complete program participation by employers, local jurisdictions, and state agencies and to make progress toward implementing successful worksite programs. According to the evaluation provided by the Task Force, by 1995, every affected jurisdiction had passed a CTR ordinance and 100 percent of the 825 worksites affected by the law, representing over 335,000 employees, were participating in the program. In addition, another 30 smaller employers were participating in the program voluntarily. Most worksites offered their program to all employees, with the result that the Washington CTR program is estimated to have covered over 465,000 employees in 1995. (Johnson nd.)

According to the Washington State Energy Office Evaluation, some employers see the CTR program as providing benefits to their company, while others see it as an unnecessary burden (Burrell et al 1995:11). An active Employee Transportation Coordinator (ETC) is seen as critical for the success of the program.

Task Force Responsibilities: Participation, Representation and Evaluation

At its outset, the CTR program faced a challenge of acceptability and effectiveness. Success of the program is dependent upon gaining and maintaining the cooperation and participation of the affected jurisdictions and employers. To address this challenge, the CTR law established a 23-member Task Force composed of citizens and representatives of employers, local jurisdictions, transit agencies, and state agencies to provide oversight and guidance and a Technical Assistance Team to promote program consistency statewide, enhance collaboration, and assist jurisdictions and employers in developing effective CTR programs (Merchant 1995:2; Lagerberg nd). The Task Force is mandated to oversee implementation and evaluation of the law, including assessing progress toward implementation, evaluating benefits and costs of the program, assessing program impacts, and providing recommendations about whether the law should be continued, modified, or terminated (Johnson nd). To gather information about the progress of the program, the Task Force sponsored a series of five open forums for employers affected by the CTR law, whose purpose was to communicate directly with employers and local jurisdiction representatives.

Governmental Agency Responsibilities: Leadership, Support, Participation and Evaluation

The law requires state government to take a leadership role in the program (Merchant 1995:2). The Washington State Department of Transportation (WSDOT) is the lead agency, responsible for implementation and evaluation of the program. (Johnson 1996; Johnson nd; Egan nd). The Department of General Administration coordinates the state plan and assists state agencies with transportation policy development. The 1995 State Transportation Policy Plan provides cost-efficient alternatives, such as public buses and vanpools, to single-occupant commuting and helps increase public awareness of the need to decrease vehicle trips. In 1995, the state budget for CTR was $3.1 million per year. Of this, $2.4 million passed through to local jurisdictions to cover administrative and oversight costs, technical assistance to employers, and special projects.

Responsibility for implementing the CTR law is delegated to local governments in the eight affected counties. Counties affected by the law and jurisdictions within them that have affected worksites must adopt a CTR ordinance and develop a CTR program for their employees and establish goals for reducing the single-occupant vehicle rate (SOV) and vehicle miles traveled per employee (VMT) at affected worksites. Cities adopted their own ordinances, allowing each jurisdiction to consider the needs and resources available to employers and commuters within their region. Local jurisdictions are

using the CTR program as a strategy in their transportation and growth management planning, and use information from the program to help identify projects that support the transportation needs of major employers.

A number of local jurisdictions provide support and technical assistance to the CTR program and participating employers. King County Metro has been particularly active in this effort. (Merchant 1995: 1-2.). According to an evaluation conducted by the Washington State Energy Office, local jurisdictions attribute much of the success of the program to the "cooperative nature of the relationship between local jurisdictions and employers" (Burrell et al 1995:1). Maintaining this cooperative relationship is expected to be challenging, given the responsibility local jurisdictions have to enforce the law by requiring program modifications when employers do not meet goals.

THE KING COUNTY PROGRAM

King County's Transit Division and its predecessor, Metro, have been advising local employers about alternative modes of transportation for nearly 15 years. Formerly known as the Municipality of Metropolitan Seattle (Metro) before its 1994 merger with King County, the King County Department of Transportation's Transit Division prepares and makes available useful CTR program materials to employers within King County. Those materials clearly describe the employers' responsibilities under state law and applicable local ordinances. They also provide thorough checklists to help employers' CTR representatives plan and carry out successful programs at their work sites[5]. A recurring theme from employer representatives surveyed is that using the regional CTR program experience of KC Transit staff has saved the employers start-up and implementation costs and contributes to their successful CTR programs.

As the agent for 15 local jurisdictions within King County, KC Transit advises employers on planning and promoting a tailor-made CTR program for their affected work sites. KC Transit representatives provide an array of services. These services include information on how to analyze employee needs, survey employees, garner corporate resources, "train the trainer," set goals for individual work sites, set up pass sales or fare subsidy programs, plan incentive programs and promote the CTR program. CTR program staff also tracks employer progress and collects regional performance data (Metro Transit 1996a).

Commuting options available in the Puget Sound region include bus (provided by three separate systems), ferry, carpooling, vanpooling, bicycling, walking, telecommuting, flextime and alternative or compressed work schedules.[6] The travel demand management (TDM) options which comprise the incentives and penalties provided by CTR programs are grouped into six categories:

- parking management—items such as discounted parking costs or priority parking spaces for carpools and vanpools;
- subsidies—including subsidies and incentives for use of non-drive-alone modes;
- special programs—telecommuting, internal ridematch services, shuttle services or Guaranteed Ride Home program;
- schedules—policies allowing a work schedule that eliminates a commute trip during the morning peak such as flextime or compressed work week schedules;
- fleet vehicles—providing company vehicles for work-related trips, carpooling or vanpooling; and
- site amenities—items such as bike racks and showers.

The King County CTR program provides information to employers about those alternative modes, costs of planning, and effective ways to encourage employees to consider alternatives to solo driving. One KC Transit staff member explained, "There is no substitute to energetic, nay mildly aggressive, on-site promotion of this program. Getting people to 'think green' is probably more successful in the Puget Sound area than appealing to people's pocket books." The publication *How to Implement and Promote Your CTR Program* offers local employers a variety of cartoon clip art and copy designed to encourage employees to explore alternative ways to get to work. The themes include strategies to approach people inclined to ask "what's in it for me?" (reduce stress and save money), invoke a little fear and guilt ("can you live with dirty air?") or encourage people to be part of something better ("Clean Air? It's your choice").[7]

TWO EXAMPLE PROGRAMS

In addition to providing the public transit facilities and system, technical assistance, and research and evaluation services, KC Transit also works to identify collaborative initiatives that can provide service to residents and workers in King County and contribute to trip reduction efforts. Two examples of such innovative programs undertaken in support of the CTR legislation are the Preston vanpool and the U-Pass programs. Both programs are examples of programs that combine subsidies with special program elements to meet the needs of special populations and employers.

Preston Vanpool Project

Preston is a rural city about 25 miles outside Seattle. Preston was a logging town but during the past decades has lost its main industry and much of its population base. Not far from Interstate 90, Preston has recently become the location of a new industrial park. Because the work force in the area was insufficient to support the needs of the new manufacturing businesses, new employers looked elsewhere for the employment pool and transportation to its work site. Representatives from the industrial park met with the Greater Seattle Chamber of Commerce and local government representatives. The Seattle/Preston Workforce Connection was formed to provide training for citizens living in the central district of Seattle and link them with jobs available in the Preston Industrial Park. The Central Seattle district, like many other inner-cities, suffers from a diminishing number of entry-level employment opportunities. (Urban Enterprise 1996) The Workforce Connection group recognized that to get trained people from the inner-city to the industrial park required the cooperation of many groups including KC Transit. During a two-year period, a coalition of creative individuals from government, businesses and social agencies designed a blueprint to provide training to workers—and transportation to get them to jobs in Preston. [8]

The Department of Social and Health Services and Employment Security agreed to make available to a Preston employer, a pool of job-ready applicants who would be prescreened and ready to work. This reduced recruitment, hiring and training costs for the employer. Dependable workers were needed by the employer who, in turn, was willing to diversify its work force and provide jobs to a targeted community. The employees would be trained, coached, and counseled by persons dedicated to the success of the program.

Transportation to the industrial park is provided by KC Transit vans and subsidized in part by the Department of Transportation and the affected employer. Initially, 17 new employees were trained and hired; the employees are picked up in their neighborhood by the vans and transported directly to the work site.

Still in its infancy, the Seattle/Preston work force project is not without critics. Some argue that transporting entry-level workers outside their neighborhoods to minimum-wage level, or even $6-$7 per hour jobs is not sustainable. Others, however, contend that this public/private partnership is a realistic alternative to unemployment and provides workers with experience and an opportunity to "integrate into a new and different work environment to positively affect their future, both individually and as an overall community." (Seattle/Preston Workforce Connection 1996:2) These workers get more than a pay check. Discussions about child care and YMCA camps in Preston are underway. In addition, a low-cost Basic Health Plan will be available to the employee which will be transferable if the employee moves on.

The U-Pass Project

The University of Washington (UW) is an educational institution with 50,000 students, faculty, and staff on campus each day. Roughly 15 percent of the students live in on-campus student housing; the rest commute to campus by other means. To alleviate traffic congestion, the UW has had notable success with its flexible U-Pass program, which has been recognized internationally as a leader in commute trip reduction efforts. (University of Washington 1996)

The U-Pass program began as a three-year pilot project in 1991 and has had overwhelming success. Offered to every student, faculty, and staff member, the U-Pass provides many benefits including unlimited rides, seven days per week, on King County's Metro buses and Community Transit (CT), the transportation service in Snohomish County north of King County. The benefit is substantial, as the cost for this pass is only $27 per quarter for students and $37.50 per quarter for faculty and staff.[9] The U-Pass is funded by user fees, general parking fees, and other UW general fees.

To offer more frequent and convenient bus service to the UW campus, the university negotiated with KC Transit and CT for additional bus routes and annual service hours. The buses are also equipped with bike racks, a popular feature among students who bike one direction and ride the bus the other. Bus ridership has increased on the University campus from 21 to 34 percent since the U-Pass program began.[10]

The University, which has 12,000 parking spaces, 50,000 students, faculty, staff and thousands of guests and visitors weekly, collaborated with KC Transit's predecessor, Metro, to develop two innovative reciprocal programs that link subsidies for transit use (U-Pass) with parking management options specifically to respond to employee/student needs for flexibility. In one program, the faculty or staff member who has purchased a U-Pass but no quarterly or annual parking permit is allowed to purchase a book of individual commuter parking tickets during an academic quarter, at a rate roughly half that charged to faculty/staff who have not purchased a U-Pass. The individual tickets can be used in specific parking lots or zones an average of twice a week, thereby allowing the employee to take alternative transportation the other three days. In the other program, employees who need to drive their cars to campus most days, and some residence hall students, may obtain monthly parking for $42.00. These people are given a complimentary U-Pass, to encourage them to use alternative transportation when driving their car to campus is not necessary. (University of Washington 1996:3)

MONITORING AND EVALUATION: RESULTS

STATEWIDE INTERNAL ASSESSMENT ACTIVITIES

Data from a variety of sources were collected to help evaluate the effects and effectiveness of the CTR program. At this stage in the program, attention has not been directed toward analysis of the

differential impacts of the program or individual incentives on different types of organizations or different groups of individuals, although this need was identified in the Phase 1 assessment documents.

Data compiled for program assessment in Phase 1 included:

- Biennial employee questionnaires (approximately 220,000 biennially, 1993 and 1995).
- Annual reports and program descriptions (900 per year).
- CTR cost survey (290 biennially).
- ETC, jurisdiction, and county focus groups (17 conducted in 1995).
- Employer forums (6 completed in 1994/1995).
- Employee interviews (380 conducted in 19951996). (Lagerfeld nd.)

The CTR Task Force is attempting to answer the following questions about the CTR program:

- Did employers develop and implement worksite programs?
- Did employers achieve the SOV and VMT reduction goals?
- Did the programs result in reduction in air pollution, congestion and energy consumption?
- Were program benefits greater than program costs?

In addition, in 1992 the Washington State Department of Transportation funded an intensive study of a selected sample of organizations subject to the CTR regulations in King, Pierce, and Snohomish counties. This study surveyed employees (2,495 responses out of 3,211 questionnaires distributed; 57 percent of respondents were women) and employers (45 persons at 14 worksites) in organizations considered to have "model" TDM programs. The report by Poulenez-Donovan and Ulberg (1995), indicates that transit riders, carpoolers, and others who received some benefits from the employers' TDM programs believed that the organizations, along with society, generally were "picking up the costs for TDM efforts" (p. 34). All groups "felt that society was the greatest beneficiary of the programs," although program users were more likely than SOV-users to see themselves as the primary beneficiaries. This study also found that most employees were already using their preferred mode for commuting, indicating that those carpooling, riding transit, or using other means to get to work did not prefer to drive alone to work. The TDM programs may be enabling employees to successfully utilize their preferred mode rather than causing people to change their mode preferences (p. 38)[11]. They did not examine gender issues in detail, although they did have the data to do this analysis.

In 1995, the Washington State Energy Office conducted a series of 17 focus group meetings in the affected counties, involving 124 people (Burrell et al 1995:5). No analysis of these focus groups had been published at the time of this paper.

Johnson (nd) assessed the benefits that could be attributed to the CTR program, attempting to characterize:

- Benefits to commuters arising from mode switches, such as reduced expenditures for gasoline, reduced vehicle operation and maintenance costs, and the amenities of using non-SOV modes.
- Benefits to worksites, such as the value of vacated parking spaces and increased employee satisfaction and corporate profitability.
- Benefits to society, such as reduced costs for new highway capacity or the value of increased capacity on existing highways, increased visibility and reduced materials damage and other pollution impacts, and strengthened national security associated with reduced reliance on foreign oil.

The WSDOT emphasizes both the importance and difficulty of accurately measuring the monetary and nonmonetary costs and benefits of programs such as the CTR, but emphasizes that "[q]uantifying the benefits of employer-based TDM programs such as CTR is essential if these programs are to successfully compete for resources and institutional support against traditional approaches to resolving air quality, congestion, and energy consumption problems, and if they are to be taken seriously by the public and policymakers. The TDM research community should devote significant effort to refining existing techniques and developing additional methods for quantifying the benefits of TDM programs" (Johnson nd.).

The Washington State Energy Office also collected information about first-year administrative, capital and facilities, incentives, and materials and supplies costs of first-year program implementation. This preliminary survey found that the two largest categories of administrative costs were ETCs' time and the costs of administering the biennial employee surveys. These two items accounted for about 97 percent of the reported administrative costs, and averaged $4,175 per worksite across the eight counties (Johnson nd.). The survey found that the distribution of worksite incentive and subsidy costs were highly skewed. Many sites reported incurring no costs for incentive payments or commuting subsidies (Johnson nd.).[12] The WSDOT plans to conduct ongoing analyses over the next several years to "refine the cost estimates and to understand why costs vary between different types of employers, different size employers, and employers in different geographic areas, and what particular program elements appear to be most effective at different worksites" (Johnson nd.). Current data provide only a limited ability to assess employee commuting decisions or to correlate worker characteristics with use of incentives and program impacts, in part because only limited demographic information about employees is collected and individual employees are not tracked from survey to survey. (Dodds nd.)

Data from 1993 and 1994 worksite surveys indicate that the Washington CTR program had systematic consequences for commuting patterns. Key findings were that:

- General information and promotion appeared to have limited impact, but specific information on a single mode did.
- Less and more expensive parking increased use of all non-drive alone modes.
- Incentives to use a particular mode increased use of that mode. [However, non-drive alone modes are substitutes, and actions that increase use of one mode will tend to reduce use of other modes (Dodds nd).]

Poulenez-Donovan and Ulberg (1995) conducted a study of the CTR program for the Washington State Transportation Center that included eight organizations (14 sites) participating in the Washington State CTR program. Although they collected information about employee characteristics, including gender, their analysis did not break out the results on this basis. They provided a number of recommendations for program implementation which include:

1. Identify and make policies that relate to targeted behaviors.
2. Use information sessions in work group settings as a primary means of communicating TDM program efforts to workers.
3. Provide extensive specific "how-to" information about alternate commute modes.
4. Make behavioral change goals graduated and public.
5. Include public monitoring and specific feedback regarding goal attainment.
6. Encourage or require supervisors and managers to model and reinforce alternate mode use.

KING COUNTY PERFORMANCE DATA

This section describes the King County program, focusing on data gathered from employee surveys and analyses conducted by Georgiadou and Major of KC Transit (1996), but including information from secondary sources and interviews with transportation managers and employee transportation coordinators at CTR-affected sites. The discussion focuses on the patterns of travel demand management options used at worksites and a comparison of sites according to their success in achieving trip reduction goals. Descriptive information obtained from interviews with transportation planners, managers, and employee transportation coordinators at CTR-affected work sites is included for illustration and to provide context.

Patterns of Goal Achievement in 1993 and 1995

During 1993, the first year that the CTR law was implemented, participating employers in King County were asked, on an optional basis, to conduct baseline employee surveys to validate the baseline zone values for SOV and VMT in King County. These values had been previously established by the Puget Sound Regional Council based on census data. Out of the 495 work sites in King County identified as CTR-affected in 1993, 293 conducted baseline CTR employee surveys. In 1995, the CTR-affected work sites were required to conduct another employee survey to track progress. The following data present patterns of CTR options included in the programs of the 255 work sites that conducted surveys in both 1993 and 1995.

Figure 1 shows the pattern of goal achievement at these 255 sites. Although CTR-affected work sites in King County had their official CTR programs in place for only a brief period at the time of the 1995 survey (from six to fifteen months), goal performance in 1995 compared with 1993 reveals movement in the right direction—a reduction of the proportion of drive-alone commuters and the number of vehicle miles traveled. The percentage of sites with an SOV rate worse than their zone's baseline decreased from 25 percent in 1993 to 15 percent in 1995. The percentage that achieved the levels set for 1995 increased from 41 percent in 1993 to 46 percent in 1995.

Figure 1
1995 and 1993 SOV Goal Achievement Among Sites That Surveyed Both Years

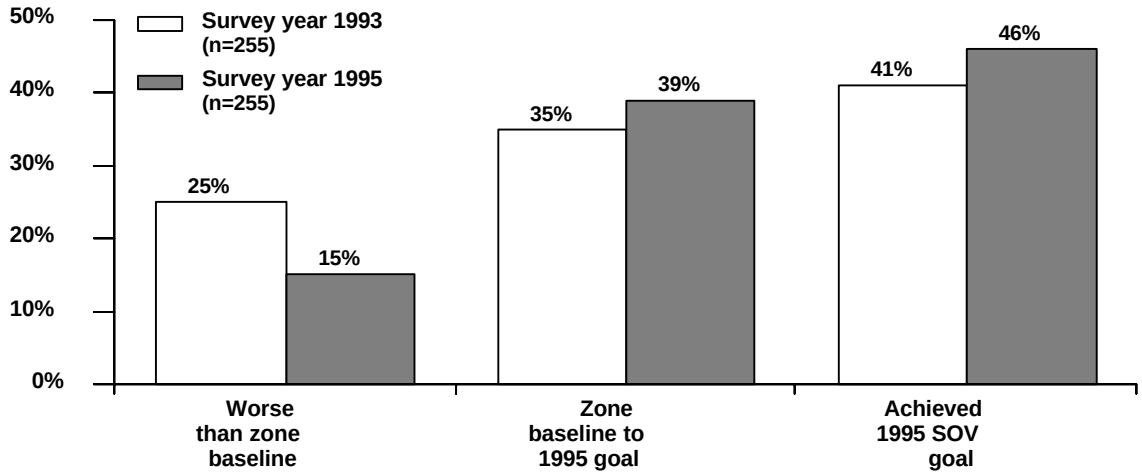
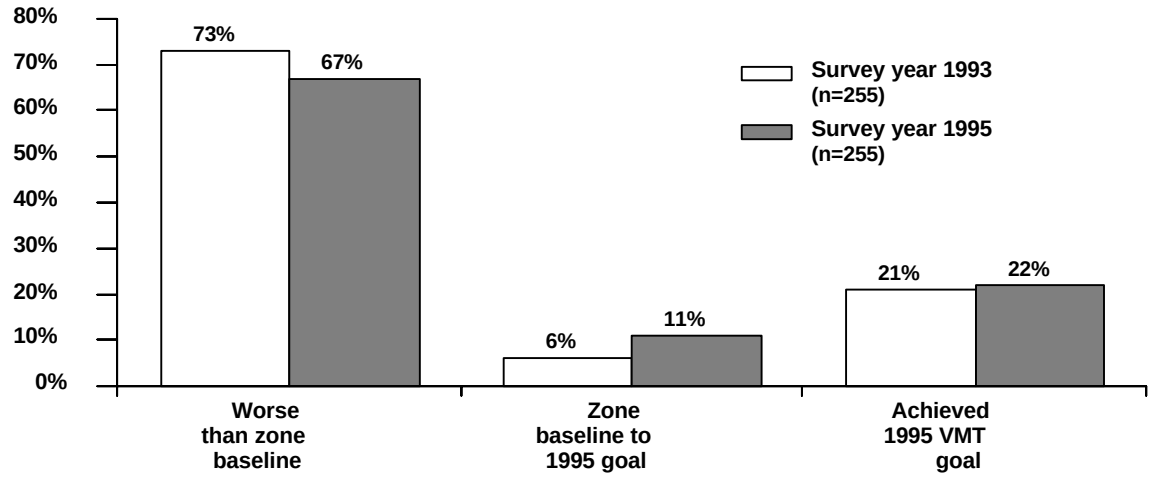


Figure 2 shows similar information for the vehicle miles traveled (VMT) data. As seen in this figure, the percentage of sites with a VMT rate worse than their zone's baseline decreased from 73 percent in 1993 to 67 percent in 1995. The proportion that achieved the level set for 1995 stayed about the same—21 percent in 1993 and 22 percent in 1995. (Georgiadou, F. and Major, M. 1996:12)

Figure 2
1995 and 1993 VMT Goal Achievement Among Sites That Surveyed Both Years



Patterns of Travel Demand Management Options Offered by King County CTR-Affected Work Sites

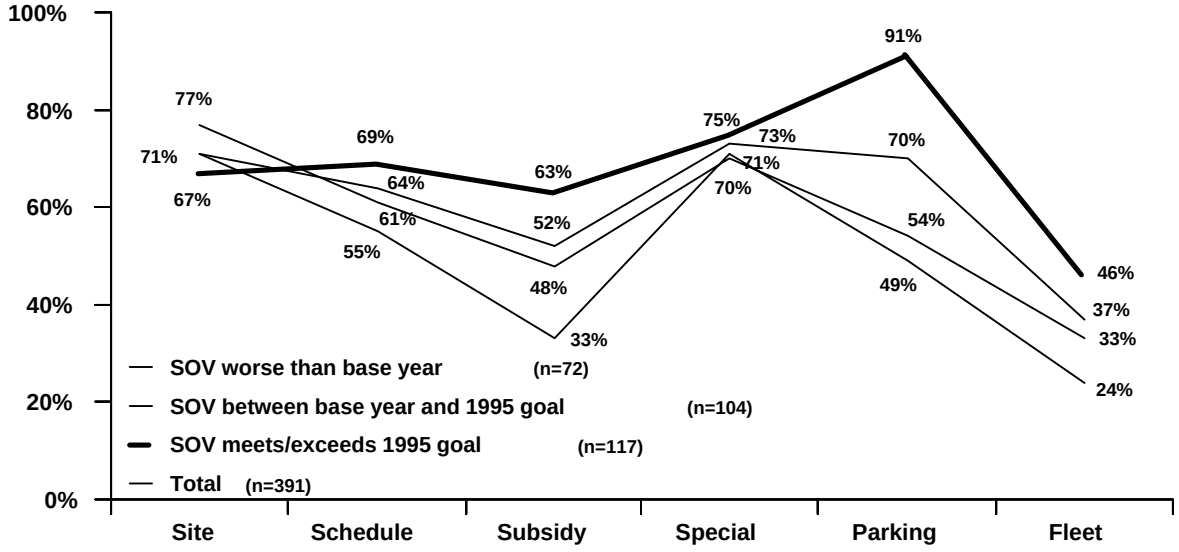
An affected work site's CTR program includes a set of transportation demand management (TDM) options, also known as the work site's CTR program elements. Work sites report information about their TDM options in their annual *CTR Employer Program Report*. The following section describes the TDM options reported in use by affected work sites when they conducted the 1995 CTR employee survey, the basis for their SOV and VMT goal measurement. Data for the entire sample are presented, along with information illustrating patterns of TDM option offerings by sites grouped according to their degree of success in meeting 1995 target SOV goals. Following this, patterns observed for elements within the TDM options are discussed.

The results presented here are preliminary and associated only with SOV goal achievement. No conclusions should be drawn as to the success or failure of different program elements based on these data, as it is important to evaluate programs in their entirety. In future analyses, the differential impacts of the individual incentives on different types of employers or different groups of employees will be examined, although the absence of gender information in the employee survey limits the ability to detail patterns of use by male and female workers.

Figure 3 shows the proportion of programs that included options in each of the six TDM categories, grouped by level of SOV goal achievement, as shown by the 1995 CTR Employee Questionnaire data. The pattern for the entire sample is also shown to provide a point of reference. Overall, more than 70

percent of the work sites reported offering special programs, site amenities, and parking options, while only 52 percent reported offering subsidies and 31 percent reported offering fleet options. Compared with sites that had not met their 1995 SOV goal, a greater proportion of sites that met their 1995 SOV goal included subsidy elements, parking management strategies, and fleet elements in their CTR programs. In particular, they were more likely to have charges for parking, discounts for carpool parking, subsidies for transit and ferry fares, and fleet vehicles for work-related trips. Sites that met their goal were also more likely to include work schedule flexibility than were those sites with an SOV rate worse than their zone's baseline value. High and low achievers did not differ significantly in the extent to which they included special programs and site amenities options (both of which were included by over two-thirds of the sites in each achievement group). (Georgiadou, F. and Major, M. 1996:25)

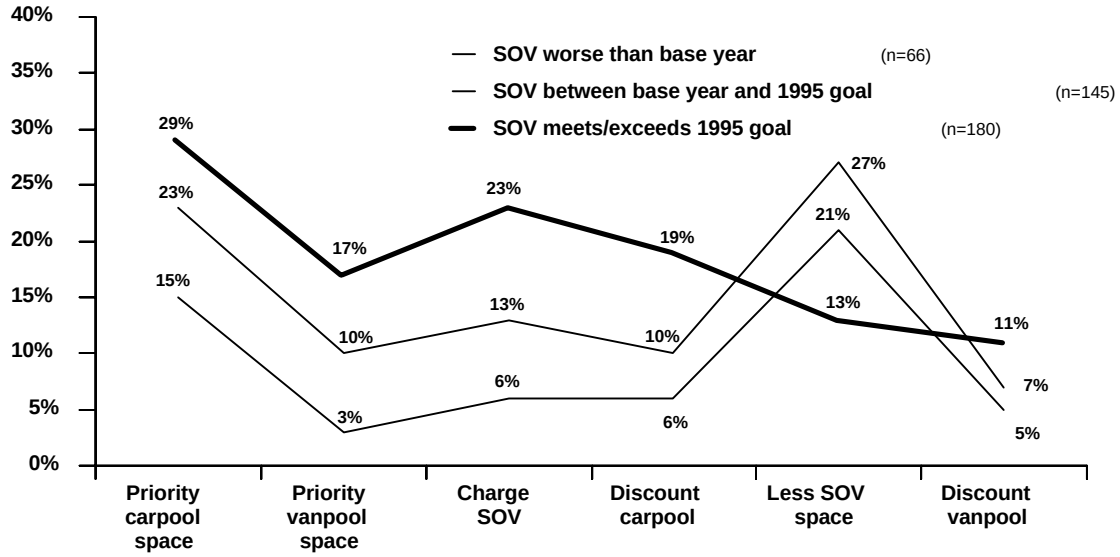
Figure 3
Types of Reported TDM Elements by SOV Goal Achievement



TDM Option 1: Parking Management.

Sites that met their 1995 SOV goal were more likely than other sites to have parking charges for drive-alone commuters and more likely to discount the parking costs for carpools. As shown in Figure 4, they are more likely than those sites with SOV rates worse than their zone's base-year values to provide priority parking spaces for carpools or vanpools. They are less likely than sites that were between their zone's base-year value and the 1995 goal to have reduced the number of parking spaces for drive-alone commuters. (Georgiadou, F. and Major, M. 1996:30)

Figure 4
Reported Parking Management Strategies by SOV Goal Achievement



Priority parking

Parking management options include preferential or priority parking at the work site and discounted parking fees for carpools and vanpools. Under the priority parking approach, spaces for carpools are reserved close to employee entrances and elevators. That feature addresses the employees' desires for parking convenience and the oft-repeated concern about safety[13]. As an example of combining methods, an employee transportation coordinator (ETC) at one site took the additional step of including a "Good for You! Thanks for Carpooling" message on the carpool-reserved signs to provide "a little peer support and pressure."

Priority parking was thought by those we interviewed to be especially effective where parking was limited, a relatively common occurrence in King County. One ETC, for example, noted that at one of their work sites, which has been grandfathered into an area that has been renewed and is now primarily residential and with very limited free parking, the provision of reserved priority spaces in the single lot next to the work site for carpoolers/vanpoolers had created a lot of employee interest and participation in carpools and vanpools.

Subsidized parking

Discounted or free parking for carpools and vanpools can be of real benefit to employees when employers do not offer free or subsidized parking on site. Transportation managers pointed out, for example, that in downtown Seattle, all-day parking rates at private lots and garages range from $6-18 per day. Most commuters expect to pay rates of $135-$200 a month in a private garage. As part of

its CTR program, the City of Seattle offers carpool parking at selected locations around the city, with the stated goals of reducing traffic congestion and pollution in downtown Seattle. The rates are $150 per **quarter** for two-person carpools and $75 per **quarter** for three-person carpools. To get a permit, carpoolers must confirm they will drive together into downtown Seattle at least four days a week. Although city workers have priority, space is available for other non-city employees on a space-available basis. There is a significant waiting list for some parking areas.[14]

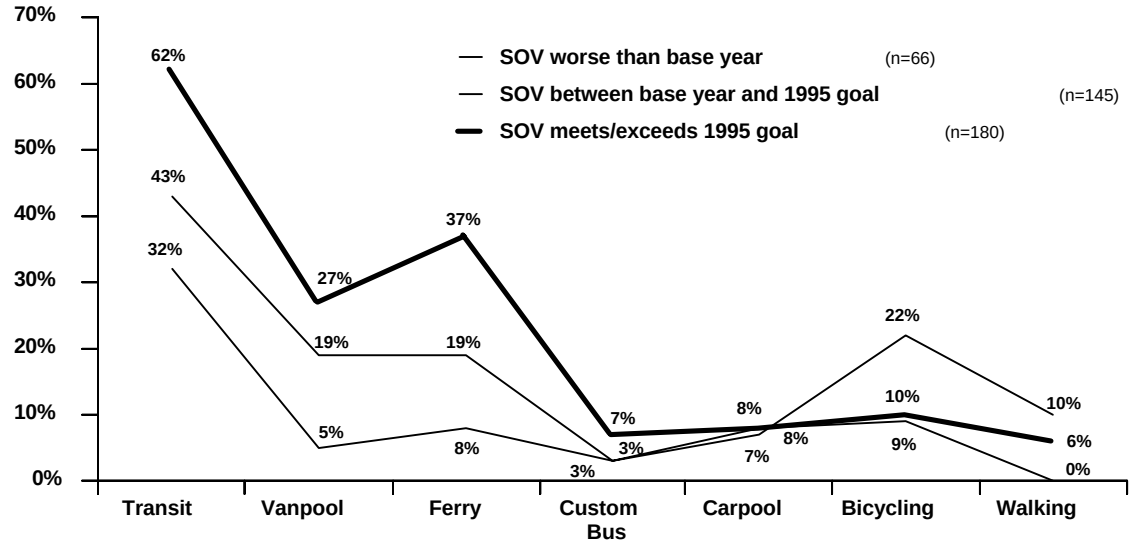
Parking passes

A parking pass allows registered carpoolers/vanpoolers, bus riders, bicyclists, and walkers to park free or at a discounted rate a number of times per week or month. This option is especially useful for employees with primary care responsibilities, because it allows them to participate in the CTR program and gives them an incentive to find an alternative to driving alone the majority of the time, while giving them flexibility to bring their cars to the work site on designated days or as needed. This offers alternatives for many workers, such as to establish carpools for their children, leave their cars at park-and-ride lots after dropping off their children, or take advantage of other commute options.

TDM Option 2: Subsidies for Alternative Transit Modes

Affected work sites that met their 1995 SOV goal are more likely than other sites to include subsidies for transit and ferry fares. They are more likely than the sites with SOV rates worse than their zone's base-year value to include subsidies for vanpool fares and incentives for walking to work. As shown in Figure 5, work sites with SOV rates between their zone's base year and their 1995 goal are more likely than all other sites to provide an incentive for bicycling to work. They are more likely to provide a subsidy for ferry fares than sites with SOV rates that are worse than their zone's base-year value. Work sites with SOV rates worse than their zone's base-year value had not provided any incentive for walking to work and thus were less likely than the other sites to have that element. (Georgiadou, F. and Major, M. 1996:28)

Figure 5
Reported Parking Management Strategies by SOV Goal Achievement



Bus subsidies

In King County (and throughout the region), KC Transit will provide bus passes to participating employers on consignment. The employer can then sell the passes to employees at a discount. Bus subsidies have been particularly effective at the University of Washington (UW) as part of the U-Pass program described above. Although most employers require employees to use the bus a high proportion of the time in order to receive a subsidy, some interest has been expressed in *individual commuter tickets*. A number of employees with child care responsibilities interviewed for the purpose of this paper said they could and would organize their after-work errands two days a week, if they could have their cars at their worksites for those times. There is growing recognition among the employee transportation coordinators interviewed that this type of flexibility might encourage an additional contingent of workers to participate in the CTR program, and that if every employee would commit to ride the bus, ride their bikes or carpool, even one day per week, a 20 percent reduction in SOV and VMT to the affected work site would be realized. In addition, data from the Rider/Nonrider Survey conducted by KC Transit has shown that a high proportion of King County residents have never ridden the bus. Encouraging experimentation by supporting a "try it" approach is seen as a way to introduce new users to alternative transportation modes, thus establishing a basis for additional behavior change and value commitment.

FlexPass

FlexPass offers employees daily access to many commute options. KC Transit and the employer work together to offer specific transportation services to employees through the FlexPass program. The FlexPass program typically includes full access to KC Transit services, ridematch service, Home Free Guarantee, vanpool fare subsidies and free or reduced rate carpool or vanpool parking. The package may also include park-free days, merchant discount programs, voucher programs or other strategies tailored to the work site. Having access to many transit benefits increases employees' flexibility when they choose their daily commute mode. It also increases the likelihood of a successful FlexPass program.

Vanpools

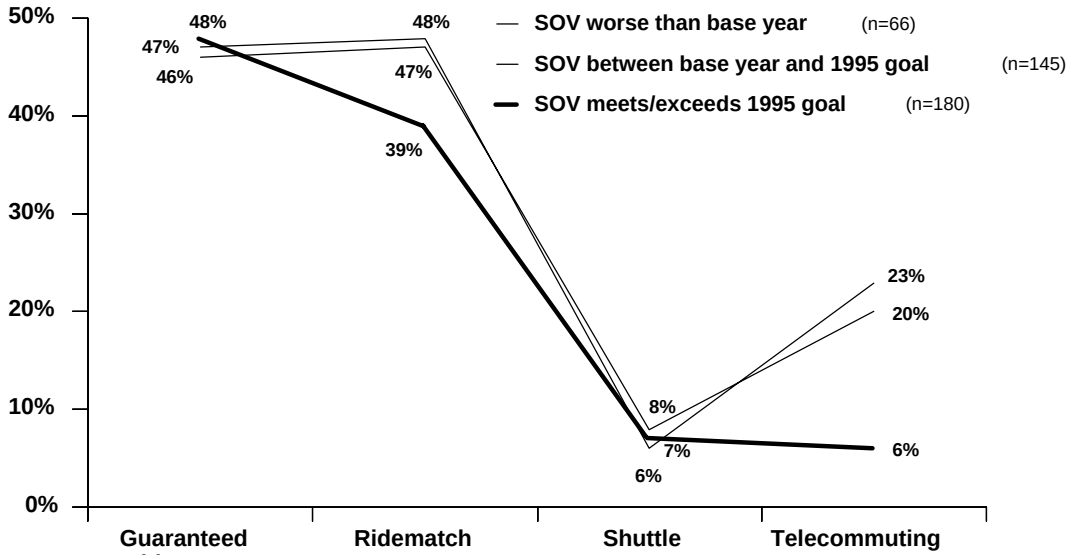
In the Puget Sound region, KC Transit has a well-organized vanpool program with more than 700 vans available to local employers. Vans accommodate 5-15 passengers. Fares are charged on a self-sustaining basis, and fares vary depending on the distance traveled and the van size. The benefit of the vanpool to the employees is that the annualized cost of vanpool fares per passenger is substantially lower than the cost of driving cars alone. The routes are also more flexible and generally faster than the bus. In addition, the vanpool driver gets to keep the van at his or her home and is allowed to use it for personal use at a reduced rate per month. Through the initiative of both employers and KC Transit, some creative vanpool programs have been initiated in King County, both before and after the CTR legislation was passed.

Responses to our targeted September survey confirmed that CTR representatives consider employee subsidies that can be used flexibly on buses, vanpools, and carpools to be one of the most important incentives of their successful CTR program. Further, King County Transit's 1994 Rider/Nonrider Survey confirmed that in response to a question posed to the general population, 31.5 percent of people surveyed said a single pass covering fares for vanpools, buses, and ferries throughout the Puget Sound region would very likely increase the use of alternative transportation.

TDM Option 3: Special Programs

Special programs were less frequently included than some of the other TDM options, even though they were popular with employees. As shown in Figure 6, sites that had already met their 1995 SOV goal were less likely than other sites to have a telecommuting program for their employees. In providing Guaranteed Ride Home, Ridematch, or shuttles, the sites do not differ statistically. (Georgiadou, F. and Major, M. 1996:29)

Figure 6
Reported Special Programs by SOV Goal Achievement



Shuttle service

Although shuttle services are offered at only a minority of the CTR-affected work sites that completed both surveys, employer-provided daytime shuttle services that take employees between buildings during the day—or are available to employees during lunch hours for errands to local shopping centers and restaurants—have proven to be an effective part of the regional CTR program, especially for large employers and employers whose workers live in concentrated neighborhoods. For example, health-care providers on Seattle's Capitol Hill operate a regular shuttle between hospitals and medical centers, as well as to the UW School of Medicine and Medical Center.

The University of Washington contracts with a private vendor to provide shuttle services from the campus directly to the rider's home after dark. One of the first of its kind on college campuses, Night Ride operates from dusk to 12:30 a.m. during the school year, in three service areas where the majority of students live. Vans circulate throughout the campus on a fixed route—picking up faculty, students, and staff with U-Passes at five locations—and deliver riders directly to their doors within the established service areas. The program has proven to be responsive to after-dark safety concerns for women students in particular. It also effectively reduces campus traffic congestion by providing direct service to and beyond campus housing. Microsoft provides shuttle services for its employees, who often work irregular hours and tend to live in areas with less dense bus service.

Guaranteed rides home

The guaranteed ride home program is a benefit offered by employers to provide employees with a ride home in an emergency. It is also available if an employee is required to work past normal hours and has taken the bus, carpool, vanpool, bicycled or walked to work that day. The purpose of the program is to give employees assurance that they can get home quickly if necessary. Studies conducted by KC Transit's predecessor, Metro, showed that "employees rate guaranteed ride home (GRH) programs as very important but rarely use them. At a relatively low cost, GRH gives employers a powerful way to lessen employee anxiety about not having emergency transportation available—and to remove strong psychological barriers that prevent individuals from trying commute alternatives." (Municipality of Metropolitan Seattle 1994:3/75)

GRH programs are clearly an important benefit to primary caregivers, because it gives employees with these additional responsibilities flexibility to get home quickly when necessary. In the region served by KC Transit, the program is called the "Home Free Guarantee" and is partially grant-funded. Under this program, KC Transit contracts with local taxis and supplies vouchers for taxi service to participating employers. After the service is used, the taxi returns the voucher to KC Transit and is repaid for the service provided under the program.

There are other successful guaranteed ride home programs in this region. Some companies choose to make their company vehicles available to employees for emergencies. Other employers contract directly with taxi companies. One pioneer of this latter approach was, again, the University of Washington. The UW's Reimbursed Ride Home program is another element of the U-Pass, and is available to all faculty and staff. Employees faced with an emergency can call one of two taxi service providers under contract with the university. The employee pays the fare at the time of the ride and submits the receipt to the university's Transportation Office for a 90 percent reimbursement. The university repays an employee at this rate up to 50 miles per quarter.

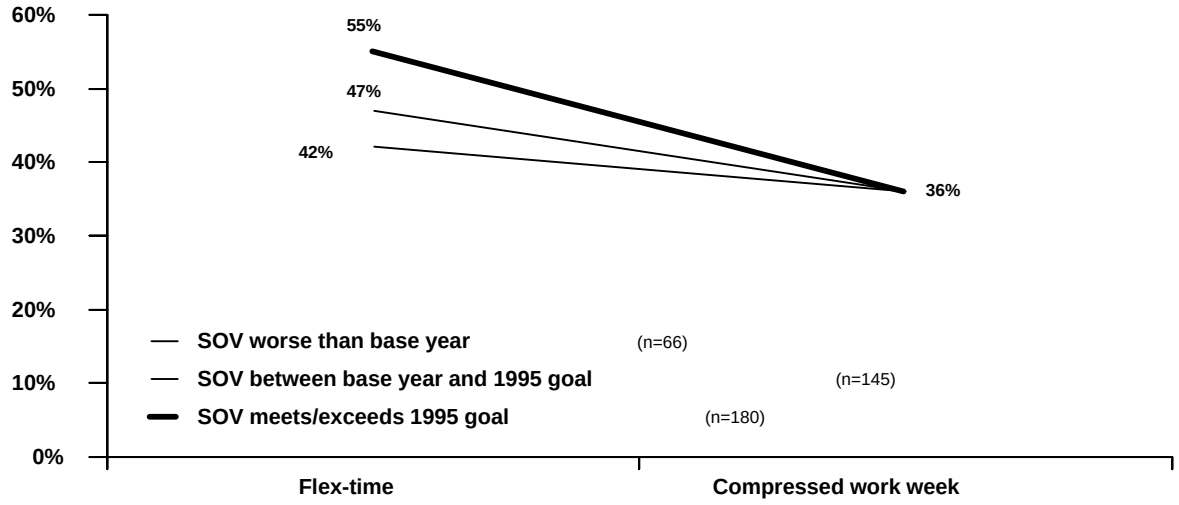
Ridematch assistance

Employer ridematch systems can greatly help ridesharing arrangements for two-person carpools, enough employees to fill a vanpool, or even custom bus service. Employer representatives surveyed acknowledged they are aware of and have used the Regional Ridematch System provided by KC Transit and annually or semiannually offer "travel fairs" to encourage new people to try alternatives. Company CTR representatives noted that most carpools coming to their work sites were, not surprisingly, created within their organizations among colleagues and friends.

TDM Option 4: Work Schedule Options

Approximately half of the affected work sites included flextime and about 40 percent allowed employees to work compressed weeks. As shown in Figure 7, the survey revealed little difference in the availability of these options among employers who achieved or failed to achieve their 1995 SOV goals. (Georgiadou, F. and Major, M. 1996:27)

Figure 7
Reported Work Schedule Options by SOV Goal Achievement



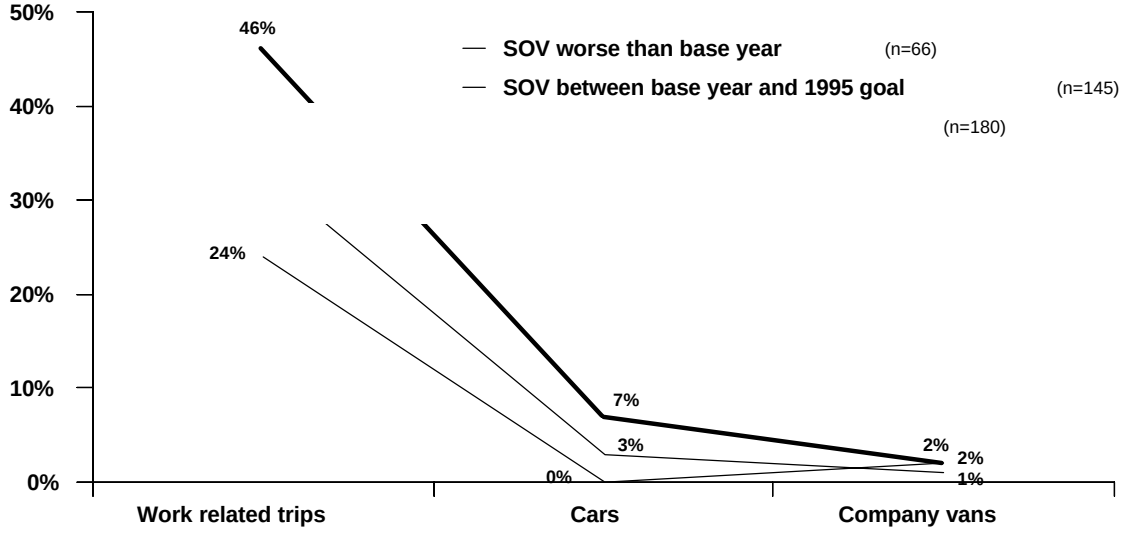
Flextime

Flextime and telecommuting options are favored increasingly by employees with family responsibilities who can effectively work alternative schedules. There is considerable literature on the use, benefits, and costs of flextime from both the employee's and the employer's point of view. The benefits for employees are clear. One cautionary note is that in unionized workplaces flextime, like other CTR benefits, has recently become an issue that must be bargained if it changes the employees' working conditions. If a policy changes the working conditions, and a union agreement is in place, the personnel, labor, and legal departments should be consulted before carrying out new policies. As noted by one personnel lawyer recently, it remains to be seen how labor unions will balance the needs of their members with family responsibilities against the tradition of granting such benefits as flextime and limited parking based on seniority.[15]

TDM Option 5: Fleet Vehicles

Figure 8 shows the distribution of work sites that include fleet vehicle options in their CTR program. Sites that met their 1995 SOV goal were more likely than other sites to provide vehicles for work-related trips. They were also more likely than sites with SOV rates worse than their zone's base-year rate to provide company cars. (Georgiadou, F. and Major, M. 1996:31)

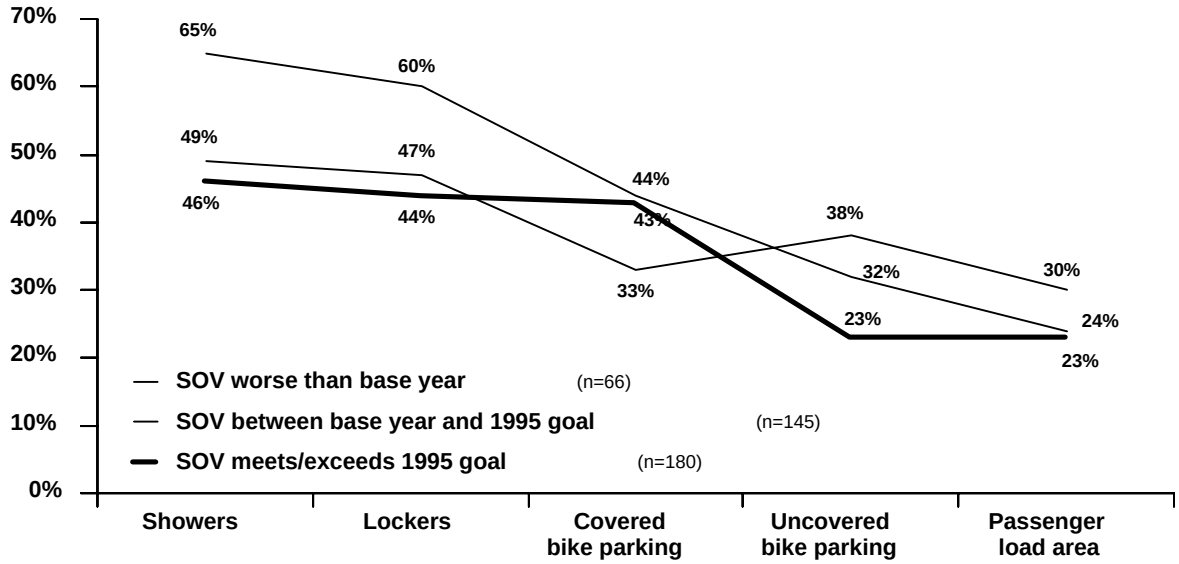
Figure 8
Reported Company Fleet Vehicle Elements by SOV Goal Achievement



TDM Option 6: Site Amenities

Worksites with SOV rates between their zone's base year value and the 1995 goal were more likely than other worksites to have showers on their premises. They were also more likely than sites that had already achieved their 1995 SOV goal to have showers and clothes lockers at the time of surveys. Sites that had already met their 1995 SOV goal were less likely to have uncovered bicycle parking than sites with SOV rates worse than their zone's base year values.

Figure 9
Reported Site Amenities by SOV Goal Achievement



CONCLUSIONS AND RECOMMENDATIONS

In this section, we summarize some observations about the Washington State and King County CTR programs in light of the framework presented in Section 2. The environmental literature provides useful input and perspectives for the design and evaluation of programs such as the Washington State and King County CTR programs. As one of only a few in the country, the Washington program provides an opportunity to inform efforts elsewhere on ways to reduce commuter traffic. Ongoing evaluation will continue to provide more detailed and quantitatively precise information about program attributes and performance.

As Rosenbloom and Burns (1993) have found elsewhere, equity considerations and the potential for disproportionate impacts on specific social groups such as women have not received much specific attention in the design and evaluation of the Washington State CTR program. However, several key aspects of the approach taken to the design and implementation of the program in this state appear to have lessened the potential for adverse impacts on women or other groups whose transportation choices are constrained by child care and household maintenance responsibilities or resource and time pressures. It is evident, by contrast, that considerable effort has been expended to design a program that achieves trip reduction goals by meeting organizations' and commuters' needs generally.

The Washington CTR program reflects, at least in part, a number of program design and implementation lessons derived from the environmental management literature, as discussed below.

Recognize the complexity of social and natural systems and design interventions as experiments. Incorporate monitoring and evaluation as key components of the program. The Washington State and King County programs both included a number of mechanisms to ensure monitoring and evaluation of program effectiveness. There is widespread recognition among the key designers of the program and those providing technical assistance that transportation systems and decisions are complex and interrelated. The program involved many transportation professionals who are knowledgeable of the literature on transportation decision making and the environmental and social costs of both traffic congestion alternative transportation modes.

Set outcome goals but avoid prescribing how they are to be achieved. Design flexibility into the program. The Washington State program is designed to maximize flexibility. It sets outcome goals, but provides only minimal specifications about what employers must do to meet those goals. Extensive technical assistance has been made available to employers that enables them to capitalize on the expertise available in the system and also promotes flexibility.

Analyze system characteristics and relationships. Identify key relationships that influence program design. It is clear that those formulating the program and providing technical assistance have studied transportation systems and understand many of the key relationships. Specific attention has not been given to clarifying factors affecting the commuter choices of different social groups, or that this perspective was conveyed to those responsible for program design and implementation at the affected employers. The absence of demographic information in the employee survey limits the specificity of analysis.

Inform and involve stakeholders and the public. Take a collaborative approach. The Washington CTR program has taken a very collaborative and participatory approach with employers, certainly one of the key stakeholders in this effort. Overall, the program emphasizes the development and provision of information to employers, to employees, and to the public. However, discussions with employee transportation coordinators indicate that the overall program had not emphasized involvement of employees in the design of employer programs. Since this is one of the most effective ways to ensure that options provided serve everyone's interests and that the programs are not designed in a way that results in significant adverse impacts on any stakeholder groups, it would be useful to have more information about issues or concerns associated with providing greater involvement of employees.

Where possible, provide for voluntariness, which increases acceptability and reduces perceptions of risk. Provide multiple options to increase opportunities for choice. The Washington CTR program is based on voluntariness and emphasizes the provision of incentives to change from SOV transit during peak commute hours rather than the imposition of penalties. Less than a third of the affected worksites impose charges on SOV parking or reduce SOV parking spaces. As discussed earlier, most employers provide multiple options among which employees can choose. This lessens the potential for adverse impacts or significant inequities, though sufficient information is unavailable on the demographic characteristics of option users or the constraints/limitations imposed upon option availability to determine exactly how free workers actually are to choose among nominally available options.

Address distributional and equity issues. Aside from the self-correcting mechanisms of voluntariness and choice, little attention has been given to employee distributional and equity issues. More attention has been given to the potential for inequities across employers. Evaluation information, employee surveys for example, do not include demographic information, and most employer records do not appear to facilitate analysis of distributional effects within employers. However, there apparently are some organizations that track employee benefits, including those associated with the CTR program. Our interviews and review of available data found no evidence that distributional or equity issues had become a significant issue for any employer or the program overall.

Recognize that organizational aspects influence outcomes. Thus far, there has been no analysis of the organizational characteristics of the employer programs. At this time, it is not possible to characterize the organizational location, job title, scope of authority or demographic characteristics of the employee transportation coordinators, or to analyze relationships between these characteristics and program success. It is not known, for example, what proportion of employer transportation coordinators are located in environmental management, human relations or facilities, or whether that organizational location is related to program design and success.

Provide accountability and feedback. As a consequence of the program's emphasis on monitoring and evaluation and collaboration with employers, there is a considerable sense of accountability and provision of feedback to employers in the Washington CTR program. Although the employee surveys provide the basis for feedback to employees, it does not appear that a high priority is placed on reporting back to workers what has worked well and what has failed to meet expectations. In addition, because of the lack of penalties and strong emphasis on voluntariness, there is some question about how seriously the employers view the program.

Recognize and address the fundamentals of behavioral change. The technical support provided to the employer transportation coordinators seems to reflect research on behavioral change. However, it is not clear that program implementors have been successful in translating information about behavioral change requirements into effective behavioral change support. Several people commented about the desirability or promoting incremental behavioral change (carpooling once a week, for example) and lamented their lack of success in conveying this concept and practices to the employees.

RECOMMENDATIONS FOR ADDITIONAL RESEARCH

Although the Washington CTR program provides for a considerable degree of monitoring and evaluation, some areas could benefit from additional data or research.

Information about the perceptions and viewpoints of the employees concerning the program and its need and effectiveness: In order to enhance employer evaluation, feedback and behavioral change reinforcement, a program to gather information about employee perceptions and viewpoints would be valuable. The process of gathering the information would itself provide reinforcement, and employers as well as planners could benefit from understanding the program from the perspective of the participants.

Demographics data on employees and their choice/use of CTR options: Currently, the employee survey includes minimal information about the social characteristics of the respondent. This limits analysis of equity consequences. Attempts to expand the survey would need to overcome resistance on the part of employers, and reluctance to make the self-administered employee survey longer and more complicated. Another alternative is to conduct a supplementary survey that would be designed to provide data for use analyses that would be administered to a sample of employees.

The organizational location and demographic attributes of the Employee Transportation Coordinators (ETC): Aside from a 1992 study by Wachs and Guiliano, there is little in the published literature about ETC's, although the organizational literature emphasizes the importance of these factors on program design, implementation and priority. In addition, as more companies undertake environmental management programs, it will be interesting to see how (or whether) CTR programs are integrated into overall corporate environmental planning and monitoring.

The dollar value of incentives provided and penalties imposed by the program and its distribution among different employee groups: Although there are no indications that the Washington CTR program is imposing significant monetary costs or benefits upon workers, a more detailed and rigorous analysis would be valuable. Obtaining the data needed for such a study would require a concerted effort, however, and cooperation from the employers.

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REFERENCES

Andrew, Caroline and Beth Moore Milroy. (1988). *Life Spaces Gender, Household, Employment.* Vancouver, BC: University of British Columbia Press.

Andrews, Frank M.(ed.) (1986). *Research on the Quality of Life*. Ann Arbor, MI: University of Michigan Institute for Social Research.

Bradbury, Judith A., Kristi M. Branch, Judith Heerwagen, and Edward Liebow. (1994). *Community Viewpoints of the Chemical Stockpile Disposal Program*. Prepared for Science Applications International Corporation for the U.S. Department of the Army. Prepared by Battelle Pacific Northwest National Laboratories.

Branch, Kristi M., Douglas Hooper, James Creighton, and James Thompson. (1984). *Guide to Social Assessment*. Boulder, CO: Westview Press.

Bullard, Robert D. (1990). *Dumping in Dixie: Race, Class, and Environmental Quality*. Boulder, CO: Westview Press.

Burdge, Rabel. (1994). *A Conceptual Approach to Social Impact Assessment*. Middleton, WI: Social Ecology Press.

Burrell, Angela, Dan Dodds, Tracy Egan, and Brian Lagerberg. (1995). *Implementation of Washington s Commute Trip Reduction Law*. Olympia, WA: Washington State Energy Office. Report #95-162.

Capek, Sherry. (1992). "The 'Environmental Justice' Frame: A Conceptual Discussion and Application." *Social Problems* 40(1):5-24.

Carley, Michael and Ian Christie. (1993). *Managing Sustainable Development*. Minneapolis, MN: University of Minnesota Press.

Clinton, William, J. February 11, (1994). Executive Order 12898 on Environmental Justice.

Christiansen, Torben, Laura Gordon, and Roy Young. (1993). "Transportation Demand Management at Small Employer Sites." *Transportation Research Record* 1390:66-73.

COMSIS Corporation. (1989). "Technical Memorandum 1: Specification of Requirements, Approach, Data Needs, and Application Software. Impact of Transportation Demand Management Strategies on High Occupancy Vehicle Ridership." Prepared for the Municipality of Metropolitan Seattle. Silver Spring, MD.

Corral-Verdugo, V. (1996). "A Structural Model of Reuse and Recycling in Mexico." *Environment and Behavior* 28(5):665-696.

Davis, Anthony and Conner Bailey. (1996). "Common in Custom, Uncommon in Advantage: Common Property, Local Elites, and Alternative Approaches to Fisheries Management." *Society and Natural Resources* 9(3):251-265.

DeYoung, R. (1989). "Exploring the Difference between Recyclers and Non-recyclers: The Role of Information." *Journal of Environmental Systems* 18:341-351.

Dillon, Patricia and Fischer, Kurt. 1992. *Environmental Management in Corporations: Methods and Motivation.* Medford, MA, Tufts.

Dodds, Daniel. nd. "Impacts of Washington's Commute Trip Reduction Program: A Censored Regression Model of Commuters' Mode Choices." Olympia, WA: Washington State Department of Transportation.

Edwards, Steven F. (1987). *An Introduction to Coastal Zone* Economics. New York: Taylor and Francis.

Egan, Tracy. nd. "Washington State's Commute Trip Reduction Program: Maintaining Progress through Understanding Individual Employee Needs." Olympia, WA: Washington State Energy Office.

Environmental Protection Agency. Office of Research and Monitoring. (1973). *The Quality of Life Concept*. Washington DC: Environmental Studies Division.

Ericksen, Julia A. (1977). "An Analysis of the Journey to Work for Women." *Social Problems* 24:428-435.

Georgiadou, F. and Major, M. (1996). "1995 Commute Trip Reduction Results in King County." Seattle WA: King County Department of Transportation. Metro Transit Division, Research and Market Strategy Section.

Goodman, Jr., John L. and Mark Berkman. (1977). "Racial Differences in Commuting Behavior: New Evidence from the Panel Study of Income Dynamics." *Public Data Use* 5(4):29-36.

Guiliano, Genevieve. (1979). "Public Transportation and the Travel Needs of Women." *Traffic Quarterly* 33(4):607-616.

Hardin, G. (1968). "The Tragedy of the Commons." *Science* 162(Dec):1243-1248.

Hildebrand, Stephen G., and Johnnie B. Cannon. (eds.) (1993). *Environmental Analysis*. Ann Arbor, MI: Lewis Publishers.

Holling, C.S.(ed). (1978). *Adaptive Environmental Assessment and Management*. New York: John Wiley and Sons.

Johnson, T.J. (1996). "Commute Trip Reduction Policy Alternatives." Olympia, WA: Washington State Energy Office.

Johnson, T.J. nd. "CTR in Washington State: The Impacts, Costs, and Benefits of an Employer-Based TDM Program. Mimeo." Olympia, WA: Washington State Energy Office.

Johnston-Anumonwo, Ibipo. (1992). "The Influence of Household Type on Gender Differences in Work Trip Distance." *Professional Geographer* 44(2):161-169.

Kasperson, Roger E. and Kirstin M. Dow. 1991. "Developmental and Geographical Equity in Global Environmental Change." *Evaluation Review* 15(1):149-171.

Kostyniuk, Lydia P. and Donald E. Cleveland. (1978). "Gender-Role Identification in the Methodology of Transportation Planning." Proceedings of The Conference on Women's Travel Issues, edited by Sandra Rosenbloom. September 17-20.

Kollway, Rao V. (editor) (1994). *Environmental Strategies Handbook*. New York: McGraw-Hill, Inc.

Lach, Denise, Edward Liebow, and Kaylin Anderson. (1994). "Environmental Equity and Justice." Draft Internal Document. Seattle, WA: Battelle Seattle Research Center.

Lagerberg, Brian. nd. "Washington State's Commute Trip Reduction Program: Phase 1 Assessment and Implications for Program Design". Olympia, WA: Washington State Department of Transportation, CTR Office.

Lee, Kai N. (1993). *Compass and Gyroscope*. Washington, DC: Island Press.

Lynch, G. and S. Atkins. 1988. "The Influence of Personal Security Fears on Women's Travel Patterns." *Transportation* 15:257-277.

McGinnis, Richard G. (1978). "Influence of Employment and Children on Intra-Household Travel Behavior." In Sandra Rosenbloom (ed), *Women s Travel Issues: Research Needs and Priorities*. Proceedings of The Conference on Women's Travel Issues, September 17-20. Washington, DC.

McLafferty, Sara and Valerie Preston. (1991). "Gender, Race, and Commuting Among Service Sector Workers." *Professional Geographer* 43(1):1-15.

Merchant, Judith. (1995). "1995 Report to the Washington State Legislature: Commute Trip Reduction." Olympia, WA: Commute Trip Reduction Task Force, Washington State Energy Office. Report #95-163.

Metro Transit. (1996). "1995 Comprehensive Rider / Nonrider Survey." Prepared by Northwest Research Group, Inc. Prepared for the Research and Market Strategy Division, King County Department of Metropolitan Services. Seattle, WA.

Metro Transit. (1995). "1994 Comprehensive Rider / Nonrider Survey." Prepared by Northwest Research Group, Inc. Prepared for the Research and Market Strategy Division, King County Department of Metropolitan Services. Seattle, WA.

Meyerhoff, Alex, Martine Micozzi, and Peter Rowen. (1993). "Running on Empty: Travel Patterns of Extremely Poor People in Los Angeles." *Transportation Research Record* 1395:153-160.

Michelson, William. (1988). "Divergent Convergence: The Daily routines of Employed Spouses as a Public Affairs Agenda." In Andrew, Caroline and Beth Moore Milroy. *Life Spaces Gender, Household, Employment.* Vancouver, BC: University of British Columbia Press. Pp. 81-101.

Municipality of Metropolitan Seattle. (April 1993). *How to Develop your CTR Program*. Seattle, WA. 1994. *How to Implement and Promote Your CTR Program*. Seattle, WA.

Navoco, Raymond W. and Cheryl Collier. (1994). "Commuting Stress, Ridesharing, and Gender: Analyses from 1993 State of the Commute Study in Southern California." *Transportation Research Record 1433*:170-176.

Northwest Research Group, Inc. (1994). *Rider/Non-Rider Survey*. Prepared for the King County Department of Transportation Research and Market Strategy Division.

Nugent, Rachel A., Katherine F. Wellman, and Allen Lebovitz. (1996). "Developing Sustainable Salmon Management in Willapa Bay Washington." *Society and Natural Resources* 9(3): 317-325.

Orski, C. Kenneth. (1990). "Can Management of Transportation Demand Help Solve Our Growing Traffic Congestion and Air Pollution Problems?" *Transportation Quarterly* 44(4):483-498.

Ostrom, Elinor. (1990). *Governing the Commons*. Cambridge, MA: Cambridge University Press.

Pas, E.I. (1984). "The Effect of Selected Sociodemographic Characteristics on Daily Travel-Activity Behavior." *Environment and Planning* 16:571-581.

Pisarski, Alan E. (1996). *Commuting in America II*. Lansdowne, VA: Eno Transportation Foundation, Inc.

Poulenez-Donovan, Craig Jesus and Cy Ulberg. (1995). *An Analysis of Factors Accounting for Successes and Failures in the Acceptance and Utilization of Employer TDM Programs by Employees*. Prepared for the Washington State Department of Transportation. Seattle, WA: Washington State Transportation Center.

Prevedouros, Panos D. and Joseph L. Schofer. (1991). "Trip Characteristics and Travel Patterns of Suburban Residents." *Transportation Research Record* 1328:49-57.

Renn, Ortwin, Thomas Webler, and Peter Wiedemann. (1995). *Fairness and Competence in Citizen Participation.* Boston: Kluwer Academic Publishers.

Rose, Damaris and Paul Villeneuve. (1988). "Women Workers and the Inner City: Some Implications of Labour Force Restructuring in Montreal, 1971-81." In Andrew, Caroline and Beth Moore Milroy. *Life Spaces Gender, Household, Employment.* Vancouver, BC: University of British Columbia Press. Pp. 31-64.

Rosenbloom, Sandra. (1987). "'The Impact of Growing Children on Their Parents' Travel Behavior: A Comparative Analysis." *Transportation Research Record* 1135:17-25.

Rosenbloom, Sandra and Elizabeth Burns. (1993). "Do Environmental Measures and Travel Reduction Programs Hurt Working Women?" Final Report. XXX

Rosenbloom, Sandra and Elizabeth Burns. (1993). *Understanding the Impact of Transportation Demand Management Programs on Working Women*. Final Report to Women's Bureau, U.S. Department of Labor. Washington, DC.

Rosenbloom, Sandra and Elizabeth Burns. (1993). "Gender Differences in Commuter Travel in Tucson: Implications for Travel Demand Management Programs." *Transportation Research Record* 1404:82-90.

Rosenbloom, Sandra and Elizabeth Burns. (1994). "Why Working Women Drive Alone: Implications for Travel Reduction Programs." *Transportation Research Record* 1459:39-45.

Sachs, Aaron. 1995. *Eco-Justice: Linking Human Rights and the Environment*. Washington, DC: Worldwatch Institute.

Seattle/Preston Workforce Connection. (1996). *Benefits to employees.* July 25.

Stewart, Jacqueline. (1994). "Reducing Drive-Along Rates at Small Employer Sites: Costs and Benefits of Local Trip Reduction Ordinances—Pasadena Towers Case Study." *Transportation Research Record* 1433:159-163.

Thogersen, J. (1996). "Recycling and Morality: A Critical Review of the Literature." *Environment and Behavior* 28(4):536-558.

Tranter, Paul. (1994). "Behind Closed Doors: Women, Girls and Mobility." In *Women on the Move*, Conference Proceedings, South Australia. November.

University of Washington. (1996). *U-Pass: The University of Washington s Transportation Management Program.*

Urban Enterprise. (1996). *Urban Enterprise Fact Sheet.* July 25.

Vining, J. and A. Ebreo. (1990). "What Makes a Recycler? A Comparison of Recyclers and Nonrecyclers." *Environment and Behavior* 22(1):55-73.

Wachs, M. and Guiliano, G. (1992). "Employee Transportation Coordinators: A New Profession in Southern California." *Transportation Quarterly* 46(3): 411-427.

Wachs, M. (1988). "Men, Women and Urban Travel: The Persistence of Separate Spheres." Los Angeles, CA: School of Architecture & Urban Planning.

NOTES

[1] This paper was supported in part by the following FTA grants: Evaluation of CTR Programs, WA90-X140 and CTR Tools, WA90-2159

[2] Awareness about potential adverse legal consequences has led to some unusual results. To appear unbiased and above reproach from either men's or women's groups, one large organization selected a small group of individuals who were skilled at program development but who had no children among them. That group evaluated, made decisions about and set up on-site day-care options several years ago. This employer felt its objectivity toward the subject would be confirmed. It is possible to argue for a policy giving employees with day-care or family obligations some priority, such as for flextime opportunities or priority parking slots. Such a policy could have such an important purpose for the company and workers as to be a sufficient defense against a disparate treatment claim. Clearly, this is an issue for the 1990s and one that deserves careful legal evaluation.

[3] The Washington State Department of Transportation estimated that the total 1995 annual cost to implement the CTR program in Washington State was $7.5 million. (Johnson nd.)

[4] Zones were constructed based on predominant land use, population density and other characteristics. (Merchant 1995: 1).

[5] See, for example, *How to Develop your CTR Program* (1993) and *How to Implement and Promote your CTR Program* (1994), first published and disseminated by the Municipality of Metropolitan Seattle.

[6] Trains or light rail are not yet part of the infrastructure in the Puget Sound region.

[7] The KCDOT CTR program willingly shares its materials to other jurisdictions upon request. The general number for CTR Services is (206) 684-4444.

[8] King County's Department of Transportation, King County's Executive's Office, the State of Washington's Department of Transportation, the Greater Seattle Chamber of Commerce, the State of Washington's Department of Social and Health Services, the State's Department of Employment Security, the Private Industry Council, Tarah & Associates, the Urban Enterprise Center, Bernard Development Center, and the employer provided representatives and suggestions to build this program.

[9] Compare these rates to KC Transit's monthly pass rate for peak travel hours of $39.50 for one zone or $57.50 for two zones.

[10] U-Pass: *The University of Washington s Transportation Management Program* .

[11] This casts the issue of equity consequences in a somewhat different light, and reveals the complexity of the analyses of distributional impacts.

[12] The average worksite annual incentive costs ranged from $0 in Yakima County to $2,642 in King County, with a statewide average of $1,779. The statewide average 1995 total annual cost per worksite was estimated at $7,404, or $9.03 per employee and $0.095 per peak period vehicle mile trip reduced (Johnson nd.).

[13] According to the 1994 Comprehensive Rider/Nonrider survey (Metro Transit 1995) safety issues, particularly for workers who work late hours and leave their work site alone and after dark, are of increasing concern among women.. "The risks and fears of physical attack, harassment and other anti-social behavior have become a significant influence on the travel habits of many urban dwellers. Although apprehension about personal security affects many people, certain groups are particularly vulnerable. Obvious examples are women, the elderly, ethnic minorities, people with disabilities, lesbians and gay men." (Lynch and Atkins 1988:257)

[14] More information about the City of Seattle's carpool program is available through Seattle's Carpool Parking Office 206-684-0816.

[15] Special thanks to S. Pailca for this observation, September 10, 1996.