

Employer Perception of Employer-Based Trip Reduction Benefits and Strategy Implementation

Kai Zuehlke

Graduate Research Assistant
School of Civil & Environmental Engineering
Georgia Institute of Technology
790 Atlantic Drive, Atlanta, GA 30332-0355
404-385-2376
404-385-2376 (Fax)
kai@gatech.edu

Randall Guensler, Ph.D.

Professor
School of Civil & Environmental Engineering
Georgia Institute of Technology
790 Atlantic Drive, Atlanta, GA 30332-0355
404-385-2376
404-385-2376 (Fax)
randall.guensler@ce.gatech.edu

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ABSTRACT

Employer-based trip reduction (EBTR) strategies urge employers to implement incentives to reduce single occupancy vehicle rates, emissions, and congestion by influencing employee commute behavior. A survey of Atlanta area employers in 2003 and 2005 traced the implementation of employer-based transportation control measures. About 5-15% of employers offer commute benefits, less than 10% offer parking benefits, and less than 30% promote commute programs. About 15% of employers are members the Atlanta Clean Air Campaign or a local transportation management association, which promote EBTR programs and strategies. No change in benefit offering rates, membership rates, program promotion frequency, or work mode availability was detected between 2003 and 2005.

Employer perception of barriers may partially explain the level of EBTR strategy implementation. Employers most commonly regard as influential insufficient employee interest (60%), minimal perceived benefits to organization (55%), lack of upper management support (50%), and office's distance to public transit (45-50%). Distance to transit is a major barrier associated with implementing guaranteed ride home programs and all transit pass related programs. Employer implementation of onsite transit sales is correlated with increased employer perception of conflict with organization operations, high cost, and concerns regarding equity across types of employees.

Nevertheless, survey results indicate that members of the CAC and TMA's are more likely than nonmembers to offer almost all commute and parking benefits and less likely to offer free parking. Recruiting employers to the CAC and TMA's while recognizing employer worksite accessibility to transit may enhance EBTR strategy implementation.

INTRODUCTION

Employer-based trip reduction (EBTR) programs aim to reduce single occupancy vehicle rates, vehicle emissions, and congestion (1-5). Also known as employer commute options (ECO) programs, this subset of transportation demand management (TDM) tools incorporates transportation control measures designed to affect the travel behavior of workers via employer mediation (6). Atlanta TDM programs utilize many EBTR strategies.

Atlanta has faced increasing transportation and air quality problems in recent decades, culminating in noncompliance with federal Clean Air Act standards. In such an environment, business leaders and policy makers were eager to employ innovative measures to address transportation issues. A major initiative started during this time is the Atlanta Framework for Cooperation to Reduce Traffic Congestion and Improve Air Quality, a collaboration among planning agencies, business groups, and transportation management associations (TMA's) (see <http://www.tdmframework.org/>).

The Atlanta Framework envisions a multi-faceted campaign to “improve the Atlanta Region’s Air Quality and Mobility through the coordinated programs of public and private organizations designed to change individual and employer behaviors” (7). Employer-based strategies and mass media publicity supplement commute services to individuals. Programs available to individuals include 1-87-RIDEFIND, which matches interested carpoolers together, and guaranteed ride home, which guaranteed ridesharing employees a trip home under emergency circumstances. The Clean Air Campaign (CAC) coordinates TDM efforts regionally in conjunction with local TMA's and serves the public relations function of the Atlanta Framework by encouraging employers to adopt trip reduction strategies. The Atlanta Framework includes many EBTR strategies, including carpools (rideshare), vanpools, sales and subsidies of transit passes, guaranteed ride home, flexible and compressed scheduling, and telework.

Practitioners and policy makers often find it difficult to influence employers to adopt EBTR projects and programs. The limited success of early, mandatory EBTR programs has underscored the importance of inclusive planning processes in formulating EBTR strategies and implementation goals (8, 9). When employers embrace EBTR programs, researchers are challenged with determining program effectiveness. Reduction in drive alone rate relative to a pre-test or control group is a common measure of program effectiveness (10). A “performance measure continuum” that captures both the social acceptance of and quantifiable change in travel behavior has been proposed to evaluate EBTR project and program effectiveness (11).

Results presented in this paper afford unique insight into employer perception of and participation in EBTR strategies. The goal of this paper is neither to determine the effectiveness of the Atlanta Framework in recruiting employers nor to gauge the resulting amount of travel reduction. The performance of the Atlanta Framework has been evaluated previously for an earlier time period (12). This paper examines the level of implementation of a variety of EBTR strategies across time and surveys how employers perceive the benefits of these strategies and what barriers they regard as impeding implementation. In addition, the impact of employer membership in the CAC or a local TMA on the level of strategy implementation is assessed.

The survey identifies the extent to which employers implement not only specific strategies that have been targeted by the Atlanta Framework, but a spectrum of relevant strategies. The strategies included in the survey were identified by an expert survey advisory panel. Based on previous experience with the survey data (6, 13, 14), the primary EBTR strategies include guaranteed ride home (GRH) programs, onsite transit pass sales, transit/pool subsidies, deductions of transit/pool and parking expenses. The following section outlines the methodology, including survey design, data, and analytical approach. After failing to find longitudinal changes in EBTR strategy implementation, the paper proceeds to investigate employer perception of barriers. Finally, the last section identifies how members of the CAC/TMA's are more likely to offer EBTR commute benefits. The conclusion presents a summary of trends, policy implications, and future work.

METHODOLOGY

Survey Design & Response Rates

This paper is based upon data from the Atlanta Employer Commute Options (ECO) Survey, which was conducted in 2003 and 2005 as a part of the Commute Atlanta project (see <http://commuteatlanta.ce.gatech.edu/>). Commute Atlanta is an ongoing congestion pricing research project that uses GPS-instrumented vehicles to study driver behavior and consumer response to mileage-based and real-time congestion pricing (15, 16). The employer survey element was intended to control for changes in employer policies and practices that might impact trip-making behavior during the Commute Atlanta study period. The survey data provide insight into employer perception and implementation of EBTR strategies across two phases: 2003 and 2005. This time period was selected due to the Commute Atlanta project schedule and not due to any specific "treatment" presumed to have particular impact.

The original survey sample was drawn from 207 employers of Commute Atlanta households, a random selection of 300 members of the Metro Atlanta Chamber of Commerce (MACOC), and a random selection of 300 employers of 4,000 household participants in the Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality (SMARTRAQ) regional travel diary study (13, 14). The ECO survey was sent by mail to the human resources director of each employer, believed to be the best placed within the organization to know the parking, transit subsidy, workplace rules, and reimbursement policies of the company. An alert letter preceded the printed survey, cover letter, postage-paid return envelope, and a small monetary incentive. If, after a follow-up postcard, there was still no response, a second survey was sent with new cover letter and return envelope. This secondary mailing was addressed to executives for MACOC member employers with a cover letter from the MACOC president. Employer identification numbers enabled positive employer identification and tracking of all employers across phases.

In Phase 1 (2003), 35 employers declined to participate (5%), 297 employers did not respond (40%), and 406 employers completed the survey (55%), resulting in a response rate of 58%. In Phase 2 (2005), 24 employers declined to participate (3%), 338 did not respond (48%), and 343 employers completed the survey (49%), yielding a 59% response rate. The sample of completed surveys consisted of 172 employers that responded only in Phase 1 (34%), 109 only in Phase 2 (22%), and 225 that responded in both phases (44%).

Data Discussion and Limitations

Individual respondents and/or organizations with a higher regard for EBTR strategies might have more readily returned surveys, resulting in self-selection bias. However, given the low frequency of EBTR implementation reported, this seems unlikely. Because the Atlanta ECO survey targeted over 700 employers from three randomized sources and achieved response rates of 50% or better, the survey sample is considered reasonably representative of Atlanta employers. See a discussion on potential sample bias in (13). The employment sectors with largest representation are service (24% in Phase 1, 20% in Phase 2), corporate office (10%, 9%), and non-profit organization (10%, 7%).

The geographic distribution of employers was determined by categorization of geocoded addresses into three location types. In Phase 1, a total of 742 employers either did not respond, declined to participate, or returned completed surveys. Employers are assumed to be located a high-density “rail core” if they are within a 0.25 mile radius of a heavy rail station (n=89, 12%). Employers within 0.25 straight miles of any transit line (heavy rail, express bus, and local bus) are considered within a “transit zone” (n=431, 58%). Other employers in the sample are labeled “non-transit zone” (n=222, 30%). The results are used in the analysis of barriers to EBTR implementation below.

Scrutiny of the mail survey returns warranted exclusion of 44 employers believed to have never received any survey mailing in either phase. Of employers that completed a survey in Phase 1, 34 either relocated or went out of business between phases and were consequently excluded from the Phase 2 potential sample pool. After the analysis was completed, it was discovered that accidental multiple-polling of several work sites yielded cases of multiple returned surveys for a single employer. The same employer ended up coded as separate records due to redundancy across the data sources, as well as within the SMARTRAQ dataset. Nineteen records were deleted from the dataset. Most duplication appeared in pairs, with two cases of three records representing a single employer. Cleaning the dataset resulted in removing 10 cases of two-phase nonresponse (no data lost), seven cases of one-phase nonresponse (one phase of results lost), and one case of two-phase response (both lost). Due to time constraints, the analysis below was not rerun after this cleaning process. However, the magnitude of change is quite small relative to the sample sizes for each analysis, especially when considering the high level of question nonresponse.

Multiple returned surveys from a single employer present a unique, albeit unintended chance to assess the variability in the survey responses. The survey primarily targeted employer human resources directors, with the second mailing to MACOC employers addressed to a senior executive. There is some indication that some human resources directors and executives passed the survey on to support staff to complete. Thus, the “employer perception” captured in this survey takes various forms. The results indicate a high level of uncertainty on the accuracy of the response by the individual completing the survey. Targeting the human resources manager and a higher level executive on follow-up mailings with the small monetary incentive is a controlled but not flawless method to gauge employer perception within practical limits.

Analytical Approach

The survey contains nearly 200 different data elements. Employer declination, survey nonresponse, and question nonresponse inhibits analysis. Use of incomplete data would result in different sample sizes for virtually every sub-question, inhibiting statistical comparison. Without introducing imputation, the analytical solution involves filtering out records that contain blank values in any field directly relevant to each analysis. This approach retains the maximum possible sample for each analysis. However, because sample sizes can vary between analyses, direct longitudinal comparisons are possible only for the longitudinal analyses. Nevertheless, filtering provided a consistent analytical framework. Survey questions include binary, categorical, ordinal, and numeric data types on employer characteristics, opinion, metrics, and EBTR strategy implementation. Comparison of binary variables allow for chi-square (χ^2) testing of statistical significance using 2x2 contingency tables. With these one degree-of-freedom tables and an $\alpha=0.05$, the critical $\chi^2=3.841$ (which will hold true below, unless stated otherwise).

LONGITUDINAL FREQUENCIES

Benefits Offering

Whether employers offer more employee EBTR-related benefits in 2005 than in 2003 is of interest to policy analysts. The following commute benefits and parking benefits are examined, described in the survey wording:

Commute Benefits:

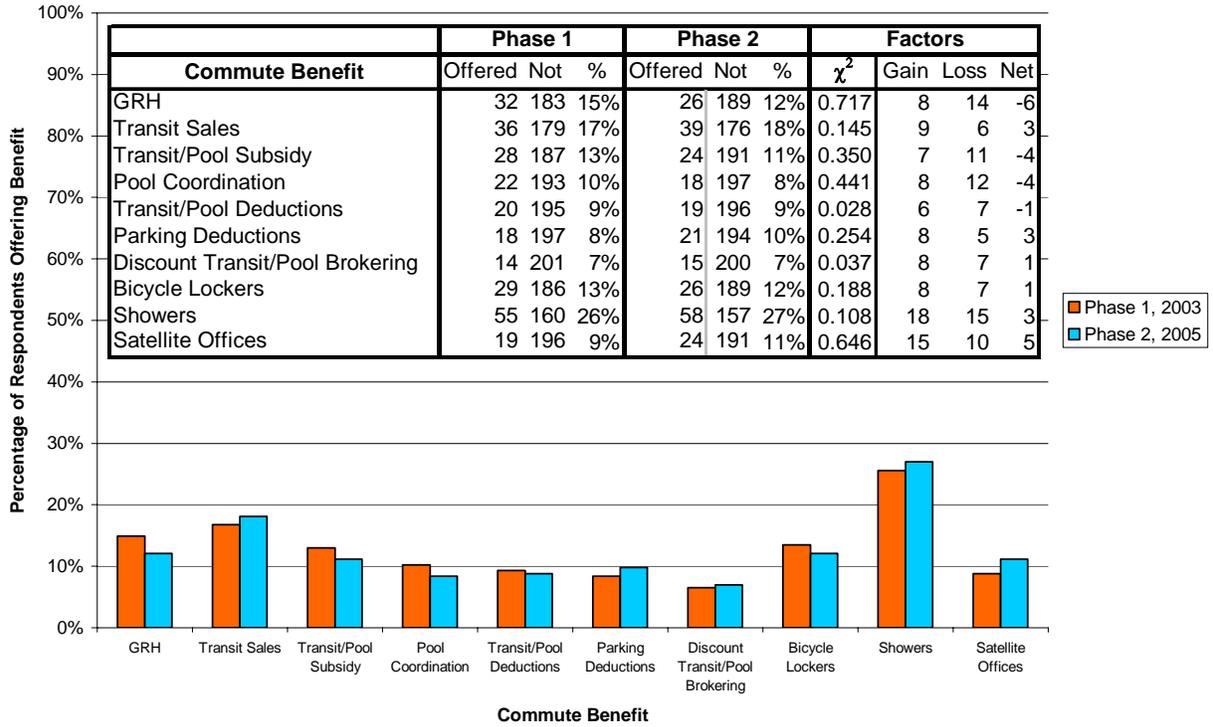
Guaranteed Ride Home:	Participation in Guaranteed Ride Home
Transit Pass Sales:	Onsite sales of transit passes or tokens
Transit/Pool Subsidy:	Employer-subsidized bus, rail or vanpool passes
Pool Coordination:	Employer-coordinated carpool or vanpool
Transit/Pool Deductions:	Deductions of carpool, vanpool or transit expenses from employee pre-tax income
Parking Deductions:	Deductions of parking expenses from employee pre-tax income
Discount Transit/Pool Brokering:	Brokering of discount bus, rail, or vanpool passes
Bicycle Lockers:	Bicycle lockers
Showers:	Showers for employees biking or walking to work
Satellite Offices:	Satellite offices from which employees can work

Parking Benefits:

No Free Parking:	Free parking not offered
Relinquishment Reward:	Cash or transit passes to employees who give up parking spaces
Offsite Shuttle:	Shuttle service to and from offsite parking areas
Carpool/Vanpool Preference:	Preferential or reserved parking for carpools, vanpools
Alternative Fuel Preference:	Preferential or reserved parking for alternative fuel vehicles

To keep the EBTR value directionality consistent, free parking was changed to “no free parking”, i.e., pay parking or nonexistent parking. Relinquishment reward is commonly known as parking cash out. Figure 1 gives the raw counts, statistical factors, and percentages of respondents offering the benefit in each phase. No statistical difference is observed between phases for the offering of any commute benefit. The “gain” factor indicate the number of employers who did not offer a benefit in Phase 1 and did offer a benefit in Phase 2 (and vice versa for “loss”). Most commute benefits are offered by 5-15% of respondents. Most parking benefits are offered by less than 10% of respondents, and about 85% of employers provide free parking.

a) Commute Benefits by Phase (N=215)



b) Parking Benefits by Phase (N=198)

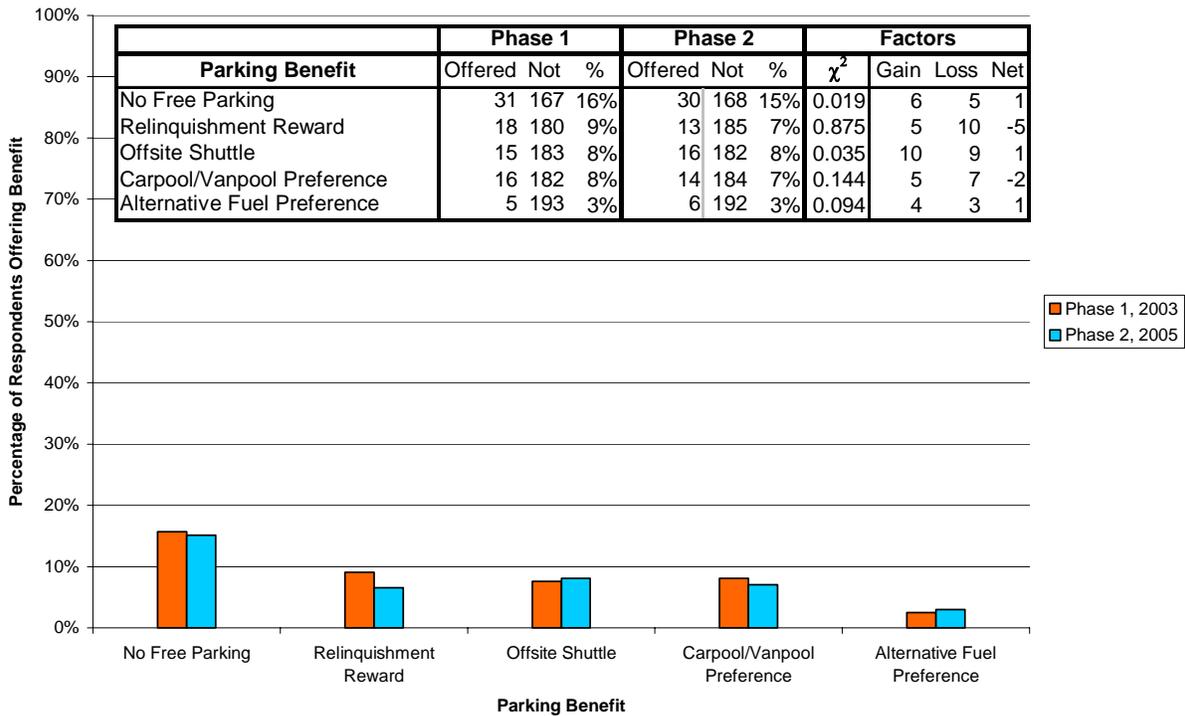


Figure 1 Change in benefits offering from 2003 to 2005.

CAC and TMA Membership

The CAC and TMA’s advocate employer commute alternative programs. According to Figure 2, membership in the CAC and TMA’s averages less than 15% of employers (N=205 after filtering). Note the slightly higher percentage of membership in the CAC (13%, 14%), than TMA’s (9%, 8%). Membership in “either” organization is the most generous criterion and is used in the membership-benefit analysis below. No statistically significant change in membership is observed for the CAC, TMA, or either.

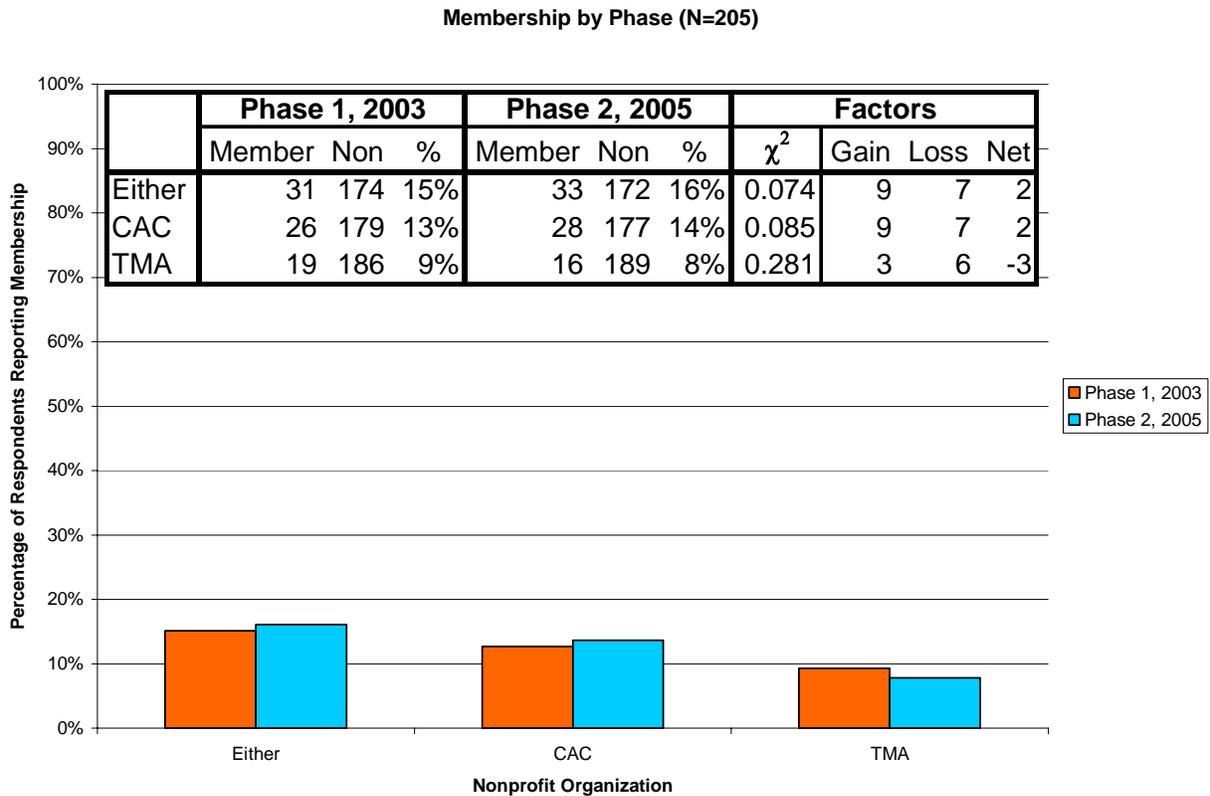


Figure 2 CAC and TMA membership in 2003 and 2005.

Program Promotion

Frequency of commute options program promotion serves as an indicator of EBTR prevalence. Employers would be directly responsible for offering the above employee benefits. Promoting programs, alternatively, could enable employers to support ongoing regional EBTR strategies without necessarily bearing direct responsibility for setting up the project or program onsite. These more “hands-off” approaches include providing information about public transit routes and fares, guaranteed ride home (GRH), and 1-87-RIDEFIND. The ordinal scale of frequency of promotion is “never,” “rarely,” “once or twice per year,” and “each month or more.” For brevity, the latter two are labeled as yearly and monthly, respectively. These four choices across the two phases yield three degrees of freedom and a critical $\chi^2=7.815$ at the $\alpha=0.05$ level. Figure 3 illustrates the results.

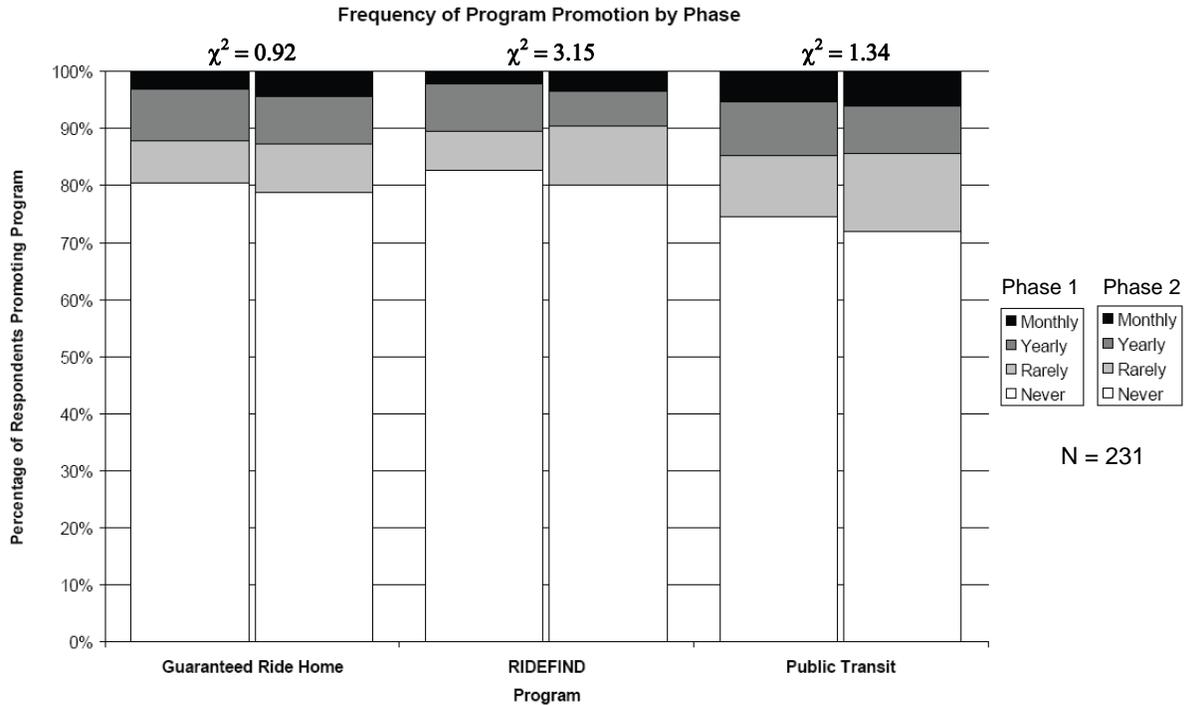


Figure 3 Frequency of program promotion in 2003 and 2005.

Twenty-six employers promoted GRH more often in Phase 2 than in Phase 1, while 21 promoted it less often. For RIDEFIND, the changes include 22 promoting more and 21 promoting less. For transit, 30 employers promoted more in Phase 2 than Phase 1 and 28 promoted transit less. Less than 30% of surveyed employers promote each of the three programs.

Work Mode Availability

Another key EBTR variable is the mode of work available to employees. These include: traditional 40-hour onsite work week, compressed work week, multiple work shifts, flexible arrival/departure times, and working from home. Possible survey responses for mode availability are “not available to employees,” “available to some employees,” and “available to all employees.” Figure 4 illustrates the percentage of employers responding for each mode and also contains χ^2 values for each mode. Given $\alpha=0.05$ and the critical $\chi^2=5.991$, no longitudinal difference in work mode availability is statistically significant. Clearly, the traditional 40-hour work week is the dominant work mode, with flexible arrival and departure times the second most available.

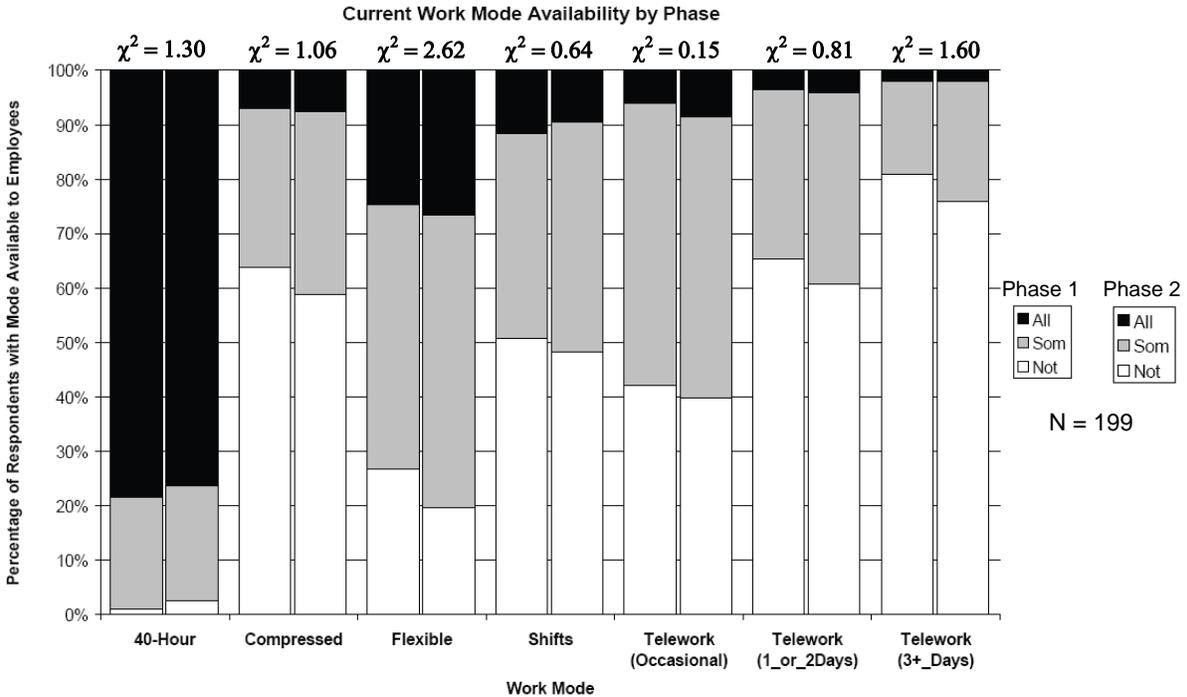


Figure 4 Longitudinal availability of work mode.

The longitudinal analysis indicates the implementation penetration rates for EBTR strategies by surveyed Atlanta employers may not have changed significantly over the last few years. It is acknowledged that the ECO survey sample may not have captured effects of recruitment efforts by the CAC that targeted sector- and location-specific employers. Nevertheless, investigating barriers that employers regard as inhibiting implementation of commute option programs will be instructive.

EBTR STRATEGY IMPLEMENTATION BARRIERS

Influential Barriers

The survey asked employers the general question, “How influential have the following factors been in preventing your organization from implementing more employee commute options?”

- Insufficient employee interest
- Minimal perceived benefits to organization
- Lack of upper management interest
- Potential regulatory or legal barriers
- Potential conflicts with organization operations
- Potential union opposition or conflicts
- High cost to our organization
- Equity issues across types of employees
- Lack of commute options information
- Our office’s distance to public transit
- Lack of government incentives
- Potential paperwork requirements

Response choices for the effect of each factor were “no influence,” “some influence,” and “strong influence.” This ordinal scale was collapsed into a binary influence – no influence. Filtering the 12 fields yielded an employer sample of 357 in Phase 1 and 305 in Phase 2. Barrier influence was cross-tabulated with the offering of commute benefits. The key question was, if a company did not offer a commute benefit, what was the potential barrier? Three major findings are discussed below: 1) the most commonly perceived barriers, 2) the strength of perceived distance to transit as a barrier, and 3) barriers to onsite sale of transit passes.

For each commute benefit, the percentages of employers not offering the benefit and also considering each barrier as influential were calculated. Each barrier’s percentages were averaged across all commute benefits. Under such consideration, the most influential barriers are:

1. Insufficient employee interest (62% in Phase 1, 60% in Phase 2)
2. Minimal perceived benefits to organization (54%, 58%)
3. Lack of upper management support (52%, 49%)
4. Office’s distance to public transit (51%, 43%)

Significant employer-perceived insufficient employee interest (51%) was also reported in the 2002 Business Leader Survey (11). Results of the Atlanta ECO Survey highlight the significance of upper management and organizational barriers on a par similar to employee interest, unlike (11). Atlanta ECO Survey respondents, typically human resources directors, represent mid-level managers within employer organizations. Survey respondents indicate significant resistance to implementing EBTR strategies when they report lack of employee interest from below, lack of upper management support from above, and minimal perceived benefits across the organization. CAC advertising campaigns may not have increased employee and employer interest in commute options programs between 2003 and 2005.

Distance to Transit

The second major finding is the strength of distance to transit as a barrier to major EBTR commute benefits in both phases: GRH, transit sales, transit/pool subsidy, deductions of transit/pool and parking expenses, and brokering of discount transit/pool passes. Table 1 indicates χ^2 statistical difference for influence of distance to transit on not offering these commute benefits. Two other statistics demonstrate the importance of this barrier – difference and consistency factors. The difference factor, $\delta\%$, indicates the raw difference between the percentage of respondents who **do not offer** the commute benefit that report the **barrier as influential** and the percentage of respondents who **do offer** the commute benefit that report the **barrier as influential**. A large positive value for the difference factor for barriers indicates the potential presence of a persuasive and preventative barrier. According to the difference factor, if an employer does not offer a particular benefit, they are on average 30% more likely to regard their office’s distance to transit as an impediment to implementing employee commute options.

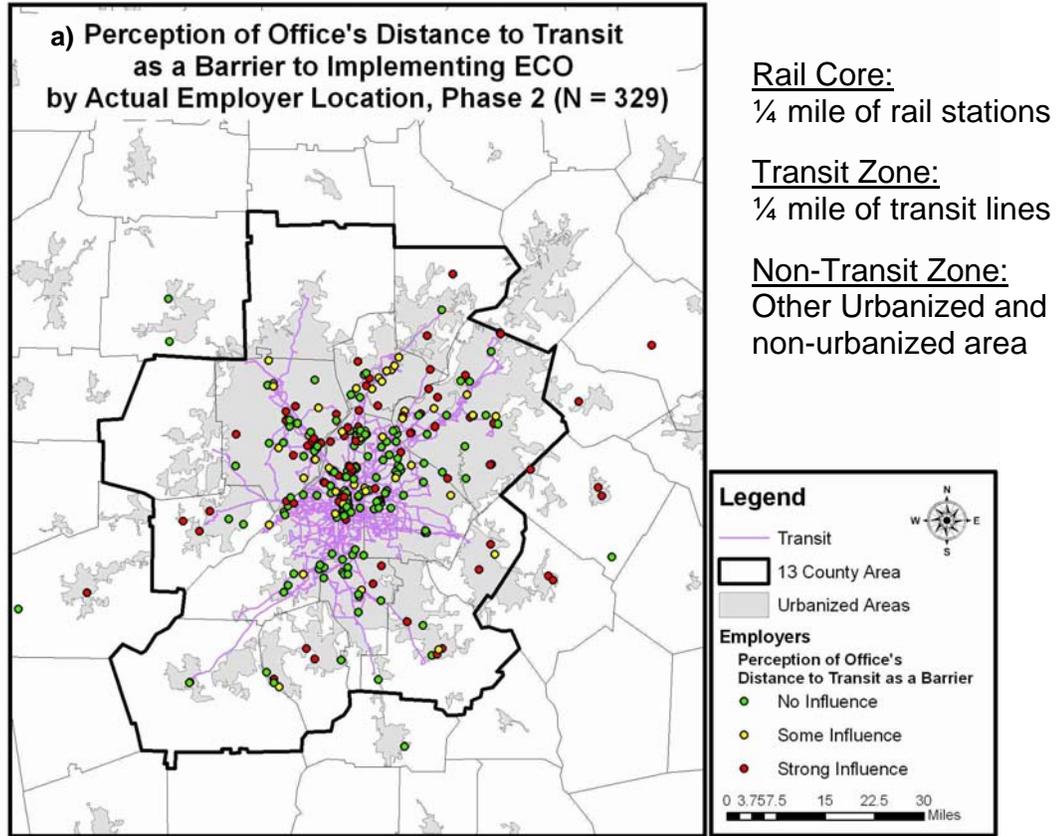
The “consistency factor,” c , is one additional dispersion statistic that relates the total number of employers who indicate barrier influence to how many end up not offering the benefit. Low values of this percentage would indicate a high level of consistency and a strong explanatory value. On average, only 4% of companies that regard distance to transit as a barrier offer any particular benefit. Employer perception of distance to transit impedes implementation of onsite

sales of transit passes or tokens, transit/pool subsidies, both parking and transit/pool deductions, and discount brokering of transit passes.

Table 1 Distance to Public Transit as a Barrier to Offering Commute Benefits

Phase 1				Phase 2			
Commute Benefit	χ^2	$\delta\%$	c	Commute Benefit	χ^2	$\delta\%$	c
GRH	6.790	20%	9%	GRH	9.630	27%	6%
Transit Sales	23.258	36%	6%	Transit Sales	15.194	29%	8%
T/P Subsidy	24.752	40%	3%	T/P Subsidy	6.411	24%	5%
T/P Deductions	4.946	22%	5%	T/P Deductions	8.062	29%	3%
Parking Deductions	16.553	41%	2%	Parking Deductions	8.062	29%	3%
Discount T/P Brokering	8.762	33%	2%	Discount T/P Brokering	6.944	29%	2%
<i>Average</i>	<i>14.177</i>	<i>32%</i>	<i>4%</i>	<i>Average</i>	<i>9.051</i>	<i>28%</i>	<i>4%</i>

To assess employer concern of distance to transit, perception of this barrier was crosstabulated with actual employer geographic location. A map of Phase 2 results, along with figures from both phases, is given in Figure 5.



Geographic Location & Perceived Distance to Transit as Barrier, Phase 1

b)		Transit Barrier P1			Total	
		No Influence	Some Influence	Strong Influence		
Geographic Location	Rail Core	n	47	9	2	58
		%	81.0%	15.5%	3.4%	100.0%
	Transit Zone	n	126	46	54	226
		%	55.8%	20.4%	23.9%	100.0%
	Non-Transit Zone	n	32	23	49	104
		%	30.8%	22.1%	47.1%	100.0%
Total	n	205	78	105	388	
	%	52.8%	20.1%	27.1%	100.0%	

Geographic Location & Perceived Distance to Transit as Barrier, Phase 2

c)		Transit Barrier P2			Total	
		No Influence	Some Influence	Strong Influence		
Geographic Location	Rail Core	n	41	6	1	48
		%	85.4%	12.5%	2.1%	100.0%
	Transit Zone	n	104	35	45	184
		%	56.5%	19.0%	24.5%	100.0%
	Non-Transit Zone	n	42	17	38	97
		%	43.3%	17.5%	39.2%	100.0%
Total	n	187	58	84	329	
	%	56.8%	17.6%	25.5%	100.0%	

Figure 5 Employer perception of distance to transit compared to actual location

Generally, employers located near transit report no influence of distance to transit as a barrier. However, many employers who appear to have good access to transit claim not to. Employers located outside the transit service area who report no influence might dismiss transit altogether.

These results indicate the worth of a research effort designed to: further determine the relationship between employer perceived and actual distance to transit, identify an acceptable distance to transit, and direct educational initiatives on transit accessibility toward employers within an acceptable distance of transit. Such work would also be useful in the planning of future regional transit. In addition, employers located an unacceptable distance from transit should not be encouraged to offer transit-related benefits. Employer-specific choice set analysis, such as that underway in the Commute Atlanta project, would provide a better picture of transit accessibility.

Onsite Transit Sales

The third finding involves barriers to offering onsite sale of transit passes or tokens. Specifically, these barriers are “potential conflicts with organization operations,” “high cost to our organization,” equity issues across types of employees,” and “lack of government incentives.” Table 2 indicates that all four barriers were significant in both phases by the χ^2 test.

The negative difference factor ($\delta\%$) indicates that employers who do offer transit sales are more likely to regard these barriers as influential than employers who do not offer this benefit. That is, employer implementation of onsite transit sales has led to increased employer perception of conflict with organization operations, high cost, and concerns regarding equity across types of employees. In addition, employer perception of lack of government incentives for commute programs is higher for the employers offering transit pass sales than those companies not offering transit pass sales. Development of government and transit agency strategies designed to reduce the burden on employers associated with offering onsite sales of transit passes should probably be a high priority.

Table 2 Barriers to Onsite Transit Sales

Phase 1									
	Not Offered			Offered			Factors		
Barrier	Influence	None	%	Influence	None	%	χ^2	$\delta\%$	c
Operations	100	203	33%	29	25	54%	8.510	-21%	22%
Cost	106	197	35%	32	22	59%	11.390	-24%	23%
Equity	71	232	23%	23	31	43%	8.674	-19%	24%
Incentives	96	207	32%	26	28	48%	5.523	-16%	21%
Phase 2									
	Not Offered			Offered			Factors		
Barrier	Influence	None	%	Influence	None	%	χ^2	$\delta\%$	c
Operations	95	155	38%	29	26	53%	4.053	-15%	23%
Cost	82	168	33%	29	26	53%	7.733	-20%	26%
Equity	69	181	28%	28	27	51%	11.293	-23%	29%
Incentives	68	182	27%	23	32	42%	4.602	-15%	25%

Also noteworthy is the fact that, in both phases, high regard for the preventative influence of “equity issues across types of employees” is correlated with low levels of offering “employer-subsidized bus, rail or vanpool passes.” Statistics for this case are: ($\chi^2=5.499$ in Phase 1, 7.111 in Phase 2), ($\delta\%=-17\%$, -24%), and ($c=19\%$, 16%). Research into the equity impacts associated with employer commute options strategies appears warranted based upon the stated concerns of industry in the 2003 and 2005 surveys. Additionally, for transit/pool subsidy in Phase 1 only, “potential conflict with organization operations” has $\chi^2=11.460$, with a -26% difference. By Phase 2, the difference reduced to -14% and was not statistically significant (2.216). The potential conflict with organization operations of transit benefits that employers perceive relate could take many forms, such as requiring flexibility of automobile travel for client meetings. Further research is needed to assess trends in employer perception of subsidies on potential conflict with organization operations.

CAC AND TMA MEMBERSHIP

Employer membership in an organization that promotes commute alternatives is one of the strongest indicators that commute benefits are offered. Members of the CAC/TMA are more likely to offer every commute benefit in both phases, except for satellite offices in Phase 1. See Table 3 for a detailed breakdown. Two consistency factors are given for each benefit-membership status pair, as two negative cases are possible. Figure 6 charts the respective percentages of respondents offering commute benefits by member or nonmember status. Also shown are the 95% confidence intervals, which should not be compared across phases.

Members of the CAC/TMA are more likely than non-members to offer virtually all commute benefits in both phases. Also members are more likely to offer onsite sale of transit passes (56% in Phase 1, 54% in Phase 2) than parking deductions (25%, 26%) and satellite offices (15%, 24%). As for parking benefits, members are more likely than non-members to offer no free parking, shuttle service to and from offsite parking areas, and preferential or reserved parking for carpools and/or vanpools.

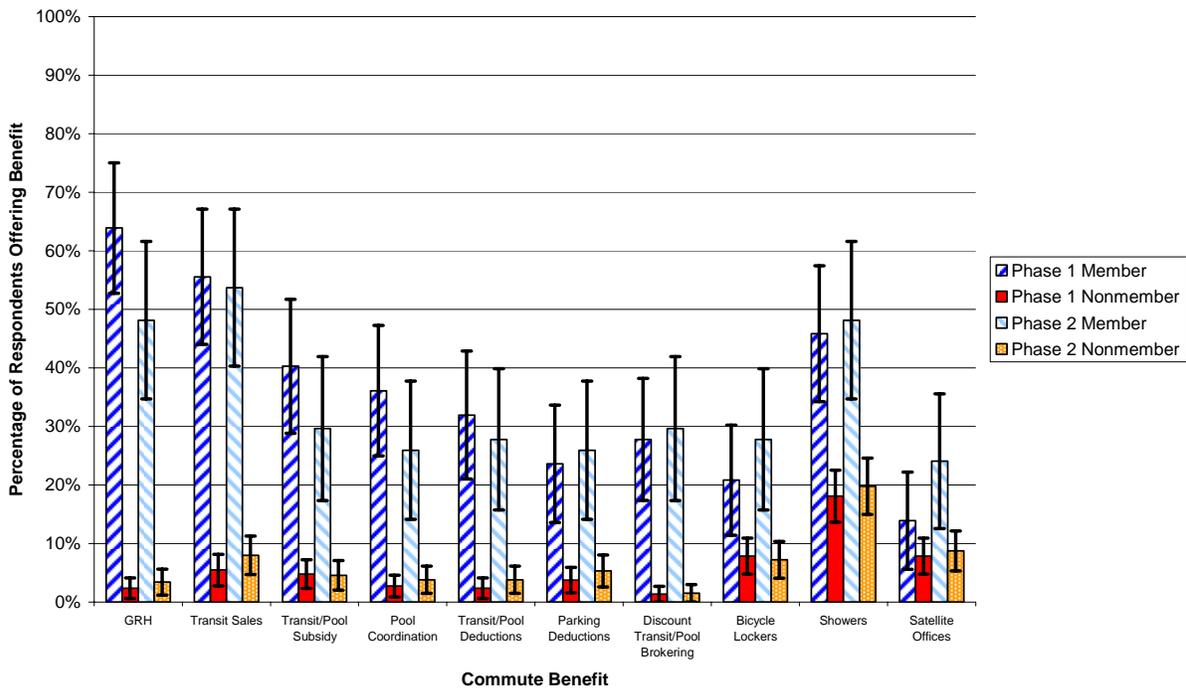
Despite the many transit-related barriers cited previously, that members are more likely to offer transit passes than pretax deductions of parking expenses indicates the strength of the CAC/TMA

EBTR programs. Further evidence includes the fact that members are more likely than nonmembers to offer no free parking, shuttles, and preference for carpool/vanpools.

Table 3 Benefits by Membership

<i>Phase 1</i>	P1 Member			P1 Nonmember			Total			Factors			
Commute Option	Offered	Not	%	Offered	Not	%	Offered	Not	%	χ^2	$\delta\%$	c_α	c_β
GRH	46	26	64%	7	286	2%	53	312	15%	176.121	61%	13%	8%
Transit Sales	40	32	56%	16	277	5%	56	309	15%	111.669	50%	29%	10%
Transit/Pool Subsidy	29	43	40%	14	279	5%	43	322	12%	70.084	35%	33%	13%
Pool Coordination	26	46	36%	8	285	3%	34	331	9%	76.239	33%	24%	14%
Transit/Pool Deductions	23	49	32%	7	286	2%	30	335	8%	66.927	30%	23%	15%
Parking Deductions	17	55	24%	11	282	4%	28	337	8%	32.176	20%	39%	16%
Discount Transit/Pool Brokering	20	52	28%	4	289	1%	24	341	7%	65.637	26%	17%	15%
Bicycle Lockers	15	57	21%	23	270	8%	38	327	10%	10.446	13%	61%	17%
Showers	33	39	46%	53	240	18%	86	279	24%	24.703	28%	62%	14%
Satellite Offices	10	62	14%	23	270	8%	33	332	9%	2.563	6%	70%	19%
<i>Phase 2</i>	P2 Member			P2 Nonmember			Total			Factors			
Commute Option	Offered	Not	%	Offered	Not	%	Offered	Not	%	χ^2	$\delta\%$	c_α	c_β
GRH	26	28	48%	9	254	3%	35	282	11%	91.246	45%	10%	26%
Transit Sales	29	25	54%	21	242	8%	50	267	16%	70.489	46%	9%	42%
Transit/Pool Subsidy	16	38	30%	12	251	5%	28	289	9%	34.959	25%	13%	43%
Pool Coordination	14	40	26%	10	253	4%	24	293	8%	31.336	22%	14%	42%
Transit/Pool Deductions	15	39	28%	10	253	4%	25	292	8%	35.450	24%	13%	40%
Parking Deductions	14	40	26%	14	249	5%	28	289	9%	23.616	21%	14%	50%
Discount Transit/Pool Brokering	16	38	30%	4	259	2%	20	297	6%	59.883	28%	13%	20%
Bicycle Lockers	15	39	28%	19	244	7%	34	283	11%	19.766	21%	14%	56%
Showers	26	28	48%	52	211	20%	78	239	25%	19.446	28%	12%	67%
Satellite Offices	13	41	24%	23	240	9%	36	281	11%	10.457	15%	15%	64%
<i>Phase 1</i>	P1 Member			P1 Nonmember			Total			Factors			
Parking Benefit	Offered	Not	%	Offered	Not	%	Offered	Not	%	χ^2	$\delta\%$	c_α	c_β
No Free Parking	21	47	31%	24	239	9%	45	286	14%	21.772	22%	16%	53%
Relinquishment Reward	13	55	19%	7	256	3%	20	311	6%	25.772	16%	18%	35%
Offsite Shuttle	11	57	16%	8	255	3%	19	312	6%	17.227	13%	18%	42%
Carpool/Vanpool Preference	20	48	29%	5	258	2%	25	306	8%	58.564	28%	16%	20%
Alternative Fuel Preference	5	63	7%	3	260	1%	8	323	2%	8.841	6%	20%	38%
<i>Phase 2</i>	P2 Member			P2 Nonmember			Total			Factors			
Parking Benefit	Offered	Not	%	Offered	Not	%	Offered	Not	%	χ^2	$\delta\%$	c_α	c_β
No Free Parking	16	38	30%	27	237	10%	43	275	14%	14.432	19%	14%	63%
Relinquishment Reward	6	48	11%	8	256	3%	14	304	4%	6.956	8%	16%	57%
Offsite Shuttle	10	44	19%	12	252	5%	22	296	7%	13.592	14%	15%	55%
Carpool/Vanpool Preference	12	42	22%	5	259	2%	17	301	5%	36.611	20%	14%	29%
Alternative Fuel Preference	5	49	9%	2	262	1%	7	311	2%	15.051	9%	16%	29%

**a) Commute Benefits by CAC and/or TMA Membership
(N = 367 in Phase 1, N = 317 in Phase 2)**



**b) Parking Benefits by CAC and/or TMA Membership
(N = 331 in Phase 1, N = 318 in Phase 2)**

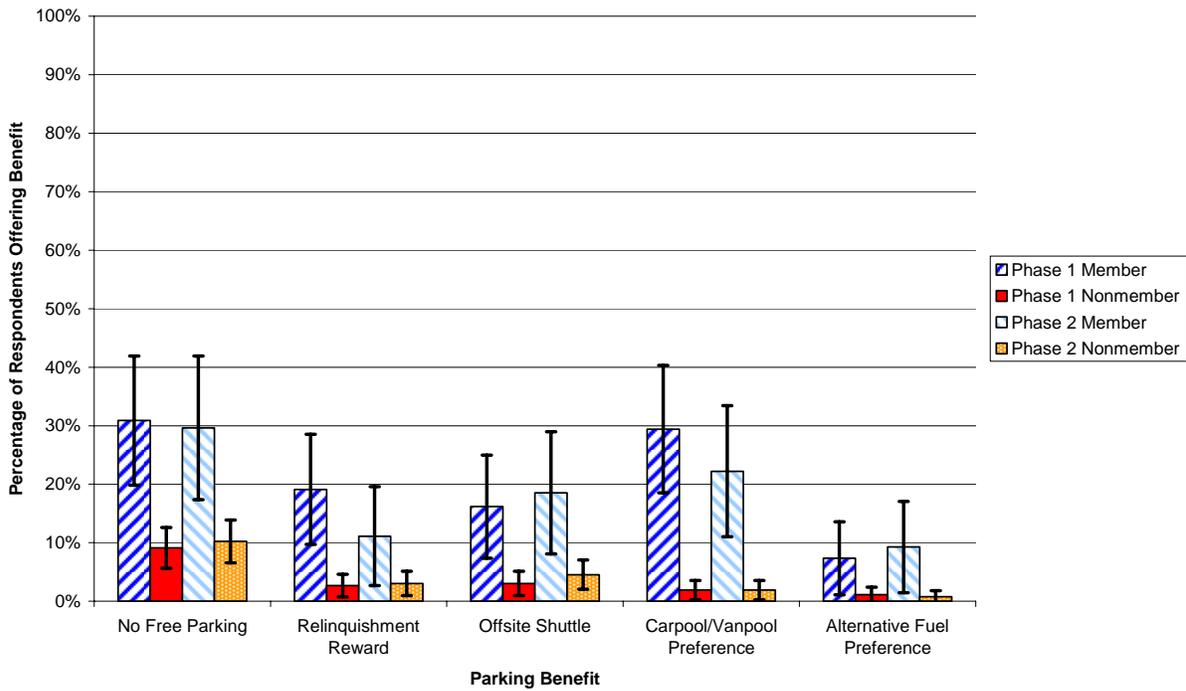


Figure 6 Benefits by CAC/TMA membership.

CONCLUSIONS

The Atlanta Employer Commute Options survey was administered in 2003 and 2005. Survey results indicate no significant change in the number of companies offering commute benefits, offering parking benefits, joining the Clean Air Campaign (CAC) or transportation management associations (TMAs), changing work modes, or promoting commute options programs. Most commute benefits are offered by 5-15% of employers. Parking benefits are offered by fewer than 10% of respondents for most strategies, although about 15% do not provide free parking. The same figure, about 15%, applies to membership in the CAC/TMA. Less than 30% of employers promote commute programs. The ECO survey sample may not have captured effects of targeted recruitment efforts by the CAC.

Employers reported major barriers to offering more ECO:

1. Insufficient employee interest (62% in Phase 1, 60% in Phase 2)
2. Minimal perceived benefits to organization (54%, 58%)
3. Lack of upper management support (52%, 49%)
4. Office's distance to public transit (51%, 43%)

Employer-perceived distance to transit was associated with employers not offering transit-related benefits and guaranteed ride home. Implementation of onsite transit pass sales has led to increased perception of conflict with organization operations, high cost, and concerns regarding equity across types of employees. In addition, perception of lack of government incentives for commute programs is higher for the employers offering transit pass sales than those companies not offering transit pass sales. Improved coordination with TMA's might ameliorate these perceived barriers.

Members of the CAC/TMA are more likely than non-members to offer virtually all commute benefits in both phases. Also members are more likely to offer onsite sale of transit passes (56%, 54%) than parking deductions (25%, 26%). As for parking benefits, members are more likely than non-members to offer no free parking, shuttle service to and from offsite parking areas, and preferential or reserved parking for carpools and/or vanpools.

The correlation between being a member of the CAC/TMA and offering benefits is striking. However, the survey data are insufficient to establish the relationship as causal. Self-selection into membership by eager employers is a possibility. Yet, the survey results raise potential concerns as to the level of EBTR acceptance and implementation in Atlanta for these time periods. In such an environment, that members so clearly offer more benefits indicates that the CAC/TMA's are generally moving in the right direction. The challenge centers on how to induce employers who might not have self-selected into membership to buy into a EBTR mindset. As echoed in the literature, it will remain important to focus EBTR programs on employers most likely to be receptive and able to implement them.

Future work for planners and policymakers should focus on:

- Surveying employers about the specific benefits/value derived from programs promoted, commute and parking benefits offered, and even CAC/TMA membership
- Investigating the perception and acceptance of distance to transit

- Directing educational initiatives on transit accessibility toward employers within an acceptable distance of transit
- Assessing trends in employer perception of subsidies on potential conflict with organization operations
- Evaluating the equity impacts associated with employer commute options strategies
- Developing strategies designed to reduce the burden on employers associated with offering onsite sales of transit passes

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REFERENCES

1. *Implementing Effective Employer-Based Travel Demand Management Programs*. Institute of Transportation Engineers and COMSIS Corporation, Washington, DC, 1993.
2. Meyer, M. D. *A Toolbox for Alleviating Traffic Congestion and Enhancing Mobility*. Institute of Transportation Engineers, Washington, DC, 1997.
3. Meyer, M. D. Demand Management as an Element of Transportation Policy: Using Carrots and Sticks to Influence Travel Behavior. *Transportation Research Part A*. Vol. 33, 1999, pp. 575-599.
4. Hendricks, S. J. *Commuter Choice Program Case Study Development and Analysis*. Center for Urban Transportation Research. University of South Florida; Tampa, Florida, 2004.
5. Henry, G. T., and C. S. Gordon. Driving Less for Better Air: Impacts of a Public Information Campaign. *Journal of Policy Analysis and Management*. Vol. 22, No. 1, 2003, pp. 45-63.
6. Dehart-Davis, L., and R. Guensler. Employers as Mediating Institutions for Public Policy: The Case of Commute Options Programs. *Policy Studies Journal*; Vol. 33, No 4, 2005.
7. *A Framework for Cooperation to Reduce Traffic Congestion and Improve Air Quality*. Georgia Department of Transportation, September 10, 1999.
8. Guensler, R. *Increasing Vehicle Occupancy in the United States*. In: L'Avenir Des Deplacements en Ville (The Future of Urban Travel); Odile Andan, et al., Eds.; Laboratoire d'Economie des Transports. Lyon, France, Tome 2, 1998, pp.127- 155.
9. Dill, J. Mandatory Employer-Based Trip Reduction: What Happened? In *Transportation Research Record: Journal of the Transportation Research Board*, No. 1618, TRB, National Research Council, Washington, D.C., 1998, pp.103– 110.
10. Higgins, T.J. How Do We Know Employer-Based Transportation Demand Management Works? The Need for Experimental Design. In *Transportation Research Record: Journal of the Transportation Research Board*, No. 1564, TRB, National Research Council, Washington. D.C., 1996.
11. Finke, T. and E. N. Schreffler. Using Multiple Assessment Levels for Evaluating Transportation Demand Management Projects: Monitoring and Evaluation Toolkit. In *Transportation Research Record: Journal of the Transportation Research Board*, No. 1864, TRB, National Research Council, Washington, D.C., 2004, pp.135– 143.
12. Center for Transportation and the Environment. *Evaluation of the Effectiveness of Programs Contained in the “Framework for Cooperation to Reduce Traffic Congestion and Improve Air Quality”, Phase Three, FY2002 Atlanta TDM Framework Final Report*; Center for Transportation and the Environment, Atlanta, GA, 2003.
13. DeHart-Davis, L. Feng, C. and R. Guensler. *Atlanta Employer Commute Options Survey Report of Final Results*. For GDOT and FHWA, December 2004.
14. Feng, C., L. DeHart-Davis, and R. Guensler. Survey Design and Preliminary Results for Atlanta Employer Commute Options Survey. In *98th Annual Meeting Proceedings*. CD-ROM. Air and Waste Management Association, Pittsburgh, PA, June, 2005.
15. Li, H., R. Guensler, J. Ogle, and J. Wang. “Using Global Positioning System Data to Understand Day-to-Day Dynamics of Morning Commute Behavior. In *Transportation Research Record: Journal of the Transportation Research Board*; No. 1895, TRB, National Research Council, Washington, DC., 2004, pp. 78-84.
16. Ogle, J., *Quantitative Assessment of Driver Speeding Behavior Using Instrumented Vehicles*, in *Civil Engineering*. Dissertation. The Georgia Institute of Technology: Atlanta, 2005.