A MICROANALYSIS OF CARPOOLING IN MCDONOUGH COUNTY, IL AND ITS RURAL SURROUNDS

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I. INTRODUCTION

The concept of high-occupancy vehicle (HOV) has long been an attraction for policymakers wanting to minimize greenhouse gas emissions (cf. the Intermodal Surface Transportation Efficiency Act, 1991 (Jaskevich 2001)). Since carpooling reduces the number of single-occupancy vehicles (SOV) on the road, research is needed to identify approaches that would be useful in increasing carpools (Burbank and Brinckerhoff (2009)). This paper utilizes the market segmentation concept in marketing to explore strategies that could increase carpooling in non-metro Illinois.

Market Segmentation

Market segmentation involves separating the total group of potential customers, in our case carpoolers, into two or more subgroups or segments (East, 2007). The objective is to gain greater response for carpooling from the general public than if the market were not segmented. Bases of segmentation include behavior, awareness-attitude, benefits sought, values, and demographics (Rossiter and Percy 1997). Briefly, behavior-only segmentation is circular by definition (for example, you carpool because you carpool). Also, it doesn't indicate response potential; it shows you what people do (commute in SOVs or HOVs) but not how to make them carpool more. The awareness-attitude segmentation overcomes the limitations of behavioral segmentation; it measures residents' awareness of and attitude towards carpooling thus enabling one to assess the response potential for carpooling in the community. However, it is expensive to implement – a sample survey of residents' attitude towards carpooling is needed to gauge response potential. Benefit segmentation, and values or lifestyle segmentation are also based on sample surveys of target markets; expensive to implement, and worse, they have been shown to be unreliable or difficult to replicate (Wells et al 2010). Indeed research conducted by Calantone and Sawyer (1978), and Yuseph and Fein (1982) indicate that over two-thirds of consumers change segments over a 12-18 months interval. What is needed is an approach to segmentation that is valid and inexpensive.

Consider the demographic variables related to personal (gender, age, education), economic (occupation, income), and geographic (county, census district) categories. These variables have varying degrees of causal influence on customer behavior (Wedel and Kamakura, 2002). At a direct level, age could influence carpooling behavior; as we age our motor skills tend to decline thus necessitating carpooling (Johnston and Rodier, 1996). Indirect, causal influences of demographics on carpooling are through demographic-group-membership values. For example, tertiary-educated group values environmental cleanliness (Burris and Winn, 2006). Since this would include a variety of behavior directed at reducing greenhouse gas emissions, carpooling could be part of this behavioral repertoire. In addition, there is evidence that upper *social class*[1] values pollution- reduction efforts (Tutman, 2011). In sum, we expect variables such as level of schooling, occupation, age, and income to be associated with carpooling behavior.

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[1] Social class is a multiple-demographic classification which combines occupation, education, income, and area of residence (Coleman, 1983).

Since, measurability of demographic variables is good, and the availability of individual-level census data makes it an inexpensive segmentation scheme to implement, we utilize demographics as segmentation basis for carpooling behavior.

II. MODEL SPECIFICATION

Consider the model:

$$y^* = \beta_1' X_1 + u \qquad\qquad u \sim \text{IN}(0, \sigma^2)$$

where y^* describes two or more people occupying a vehicle and is observed only if $y^* \geq y$. The variable y specifies the threshold number of persons (vehicle occupancy) acceptable to the commuter; for example, the commuter may want at least three people in the car[2]. We conceptualize y as unobserved and stochastic with observable determinants:

$$y = \beta_2' X_2 + v \qquad\qquad v \sim \text{IN}(0, \sigma^2)$$

The relationship between y^* and y can be expressed as:

$$y^* \geq y \leftrightarrow \beta_1' X_1 + u \geq \beta_2' X_2 + v, \text{ or}$$

$$u - v \geq \beta_2' X_2 - \beta_1' X_1$$

Let $w = u - v$. This implies that w is $N(0, \sigma_1 + \sigma_2 - 2\sigma_{12})$. Denote by N_0 the number of observations for which $y^* < y$ and N_1 the number of observations with $y^* \geq y$.

The probability that $y^* < y$ is given by:

$$\Pr(w < \beta_2' X_2 - \beta_1' X_1) = \Phi[\frac{(\beta_2' X_2 - \beta_1' X_1)}{\sigma}] \qquad (1)$$

For observations in the set N_1, we have

$$g(y^*) = \int_{-\infty}^{y - \beta_2' X_2} f(y^* - \beta_1' X_1, V) dv, \qquad (2)$$

where, $f(y^* - \beta_1' X_1, v)$ is the bivariate normal density function of u and v.

Using EQs 1 and 2, we specify the likelihood function as:

$$L(\beta_1', \beta_2', \Sigma) = \prod_{N_0} \Phi[\frac{(\beta_2' X_2 - \beta_1' X_1)}{\sigma}. \prod_{N_1} g(y^*) \qquad (3)$$

We maximize L to obtain parameter estimates.

[2] Most toll lanes in the US define a HOV as one with three or more occupants (Lee et al. 2007). Exposure to this information could have instilled a belief in the commuter that carpooling is efficient when three persons travel in a vehicle.

Having highlighted the statistical model, we operationalize it as follows: for $y*$, the actual number of people occupying the vehicle, the model is:

$$y^* = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + u \quad (4)$$

where, $y*$ = vehicle occupancy (number of occupants);
x_1= age of the resident;
x_2= travel time to work (1 to 200 minutes);
x_3= class of worker (1 = employee of a private business; 0 otherwise);
x_4= educational attainment (no schooling completed (1) to doctorate degree (16));
x_5= gender (indicator variable; 1 for male, and 0 for female);
x_6= wage or salary income;
x_7= number of weeks worked in the past 12 months (ranges from a low 13 to a high 52), and
x_8= marital status (1 = married, 0 otherwise).

The threshold number of vehicle occupancy is determined by all the above variables except gender[3], and two additional variables: x_9: industry in which employed, and x_{10}: time of arrival at work. Formally:

$$y = \gamma_1 x_1 + \gamma_2 x_2 + \gamma_3 x_3 + \gamma_4 x_4 + \gamma_5 x_6 + \gamma_6 x_7 + \gamma_7 x_8 + \gamma_8 x_9 + \gamma_9 x_{10} + v \quad (5)$$

where, x_1 through x_8 as defined above;
x_9= work industry (1= manufacturing, 0 otherwise), and
x_{10}= time of arrival at work (1 = 6.30AM to 9.00AM, 0 otherwise).

It is essential to note that while the determinants of $y*$ were sourced from a review of published literature (cf. Burbank and Brinckerhoff, 2009; Burris and Winn, 2006; Minett and Pearce, 2011; Tutman, 2011), as far the author is aware little or no published research on predictors of y (threshold number of vehicle occupancy) exist. So we relied on transportation profiles from the 2010 American Community Survey (US Census Bureau, 2008-2010 American Community Survey, Table S0804) for variable choice. Specifically, we perused the cross-classification of demographic variables with carpooled workers to specify the y function or the predictor variables (see Appendix 1).

III. MODEL ESTIMATION

Since carpooling is mostly associated with travelling to work (Martin, Chan and Shaheen, 2011), the study population consists of residents reporting wage/salary income for 2009 and travelling to work by car, truck, or van.

Data for the study were obtained from the public use micro-data files for Illinois, area 200 (PUMA 200; US Census Bureau, 2009). The geographical coverage of PUMA 200 includes McDonough County, Fulton County, Hancock County, Henderson County, and Warren County.

[3] We impose this restriction for model estimation purposes (see the discussions in section III).

To derive the likelihood function of the model, we partitioned 3715 sample observations[4] into two groups: y^* (carpooling) observed and y^* unobserved. For the first group (n=442)[5], we have:

$u = y^* - \beta_1 x_1 - \beta_2 x_2 - \beta_3 x_3 - \beta_4 x_4 - \beta_5 x_5 - \beta_6 x_6 - \beta_7 x_7 - \beta_8 x_8$, and $v < y^* - (\gamma_1 x_1 + \gamma_2 x_2 + \gamma_3 x_3 + \gamma_4 x_4 + \gamma_5 x_6 + \gamma_6 x_7 + \gamma_7 x_8 + \gamma_8 x_9 + \gamma_9 x_{10})$

For the second group (n=3273) we do not observe either y^* or y; all we know is that

$$\beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + u < \gamma_1 x_1 + \gamma_2 x_2 + \gamma_3 x_3 + \gamma_4 x_4 + \gamma_5 x_6 + \gamma_6 x_7 + \gamma_7 x_8 + \gamma_8 x_9 + \gamma_9 x_{10} + v$$

Since $w = (u - v) = N(0, \sigma^2)$, where $\sigma^2 = \sigma_1^2 + \sigma_2^2 - 2\sigma_{12}$, we can write:

$$\mathrm{P}(y^* < y) = \Phi\left[\frac{\gamma_1 x_1 + \gamma_2 x_2 + \gamma_3 x_3 + \gamma_4 x_4 + \gamma_5 x_6 + \gamma_6 x_7 + \gamma_7 x_8 + \gamma_8 x_9 + \gamma_9 x_{10} - (\beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8)}{\sigma}\right]$$

If $f(u,v)$ is the joint density of u and v, then the likelihood function is:
$L(\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6, \gamma_7, \gamma_8, \gamma_9, \Sigma) =$

$$\prod_{442} \int_{-\infty}^{y^* - \gamma_1 x_2 + \gamma_2 x_7 + \gamma_3 x_9 + \gamma_4 x_{10}} f\begin{pmatrix} y^* - \beta_1 x_1 - \beta_2 x_2 - \beta_3 x_3 - \beta_4 x_4 \\ + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 - v \end{pmatrix} dv \prod_{3273} \Phi\left[\frac{\gamma_1 x_1 + \gamma_2 x_2 + \gamma_3 x_3 + \gamma_4 x_4 + \gamma_5 x_6 + \gamma_6 x_7 + \gamma_7 x_8 + \gamma_8 x_9 + \gamma_9 x_{10} - (\beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8)}{\sigma}\right] \quad (6)$$

EQ 6 involves evaluating multiple integrals which is not only cumbersome but also difficult to implement using personal computers[6]. So we utilize a two-stage estimation approach. We define an indicator variable

$I_i = 1 \; if \; \gamma' Z_i \geq w$ where, $\gamma' Z_i$ is the criterion function;
$I_i = 0$ otherwise.

Since we do observe the sample separation for I_i, we use the probit ML to estimate the parameters. These are consistent estimates of β_i/σ and γ_i/σ for the elements of β and γ corresponding to non-overlapping variables in $f(y^*)$ and $f(y)$, and $(\beta_i - \gamma_i)/\sigma$ for overlapping variables.

Next, we estimate

$$y_i^* = \beta_1' X_{1i} - \sigma_{1w} K_{1i} + \varepsilon_{1i}, \text{ and} \quad (7)$$

[4] The 3715 observations represent 44,522 (weighted) persons.
[5] The group has a total of 5040 residents or 11% of the total population.
[6] The author's personal computer ran out of 3Gigs of memory after processing EQ 6 for about 4 hours.

where, $K_{1i} = \phi(\gamma' Z_i)/\Phi(\gamma' Z_i)$. From EQ 7 we get consistent estimates of β_1' and $\sigma_{1w} = (\sigma_{12} - \sigma_1^2) / \sigma$. Because we now have estimates of all β_1', if there is at least one variable in X_1 not included in X_2, then from the estimate of β_i/σ corresponding to this variable we obtain a consistent estimate of σ and hence consistent estimates of all the elements of γ_2'. Note that we have "gender" as the unique variable in X_1.

Next, we estimate

$$\sigma_1^2 = \frac{1}{N_1} \sum_{i=1}^{442} [\hat{u}_i^2 + \hat{\sigma}_{1w}^2 (\gamma' Z_i) \widehat{K}_{1i}].$$

This facilitates estimation of σ_{12}. Finally, from the estimate of σ^2, we estimate σ_2^2. In summary, the two- stage estimation procedure gives consistent estimates of all the parameters.

IV. RESULTS

Table 1 shows the probit ML estimates. Overall, the probability of carpooling is higher among men. In addition, the longer the travel time to work, the larger is the likelihood of carpooling.

The probit analysis also suggests that education is negatively associated with carpooling; the conditional probability of carpooling given tertiary education is a low .08. Finally, working in the manufacturing sector increases the likelihood of carpooling. This could be due to the tendency of employees working in day/night shifts to share rides.

Table 1: Probit ML Estimates

Coefficient	Estimate	Standard Error	P-Value
$Constant$	-0.3745	0.2383	0.1161
$(\beta_1 - \gamma_1)/\sigma$	-0.0069	0.0021	0.0013
$(\beta_2 - \gamma_2)/\sigma$	0.0059	0.0009	5.9841×10^{-10}
$(\beta_3 - \gamma_3)/\sigma$	-0.2547	0.0660	0.0001
$(\beta_4 - \gamma_4)/\sigma$	-0.0275	0.0138	0.0461
β_5/σ	-0.1361	0.0590	0.0212
$(\beta_6 - \gamma_6)/\sigma$	-9.0315×10^{-7}	0.000001	0.3782
$(\beta_7 — \gamma_2)/\sigma$	-0.0026	0.0030	0.3901
$(\beta_8 - \gamma_8)/\sigma$	0.0610	0.0619	0.3243
γ_3/σ	0.3747	0.0748	5.5140×10^{-7}
γ_4/σ	0.0762	0.0683	0.2644

Of the 10 demographic variables considered in the study, only three are estimable separately using probit, albeit with an unknown scale factor as a divisor. To estimate all β_i and γ_i separately, we calibrated EQ 7. The results shown in Table 2 highlight that of all the demographic variables, income is the most salient in predicting carpooling behavior. Furthermore, carpooling is predominantly a low-income phenomenon: higher the resident's income, the lower is her propensity to carpool to work. How could we utilize these results?

Table 2: **Censored-Regression Estimates**

Parameter	**Coefficient**	**SE**	**t-statistic**	**p-value**
β_1	0.43630	0.304163784	1.434425	0.1425
β_2	0.34996	0.131817369	2.654885	0.011
β_3	0.30294	8.636456418	0.035077	0.39
β_4	-0.62684	1.8367273	-0.34128	.37
β_5	0.55795	8.359128161	0.066747	.39
β_6	-0.07561	0.00118372	-63.749	2.11×10^{-64}
β_7	-1.84124	6.226103218	-0.29573	.38
β_8	0.28252	0.43345013	0.651794	.32
γ_1	0.46479	0.293732451	1.582358	.11
γ_2	0.10659	0.172299182	0.618633	.32
γ_3	1.34651	8.636738112	0.155905	.39
γ_4	-0.51399	1.928233797	-0.26656	.38
γ_6	-0.04861	8.191982268	-0.00593	.39
γ_7	-1.85189	0.00129648	-142	2.41×10^{-78}
γ_8	0.03529	6.56311577	0.005377	.39
γ_9	0.31139	0.471671485	0.660184	.32
γ_{10}	1.53561	11.83908387	0.129707	.39

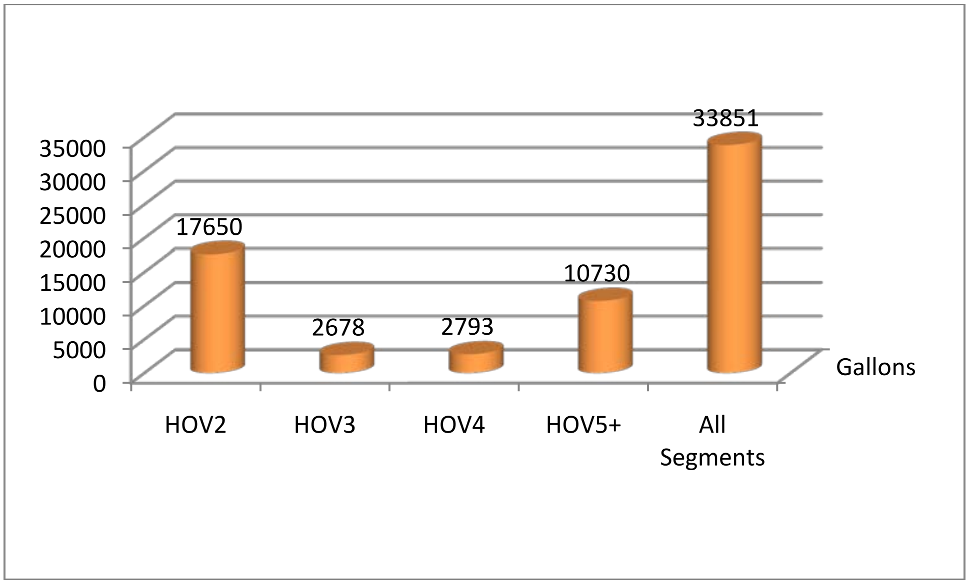
V. DISCUSSION

Our research shows weak carpooling needs in rural Illinois. The threshold number of occupants in a car, van, or truck used to travel to work is “one”. In fact, SOV is the norm for travelling to work in rural Illinois.

This finding reinforces the conclusions of a recent MRI study that the Midwest region lags behind the west and the southern states in carpooling intensity: while 43% of the adults in the West, and 30% in the South drive in a carpool on an average weekday, only 16% of the adults in the Midwest carpool (MRI, Fall 2010, Product: Automotive Miscellaneous). The numbers are much lower in our study region, 13%.

In spite of the low number, carpooling reduced fossil-fuel consumption in the region to a tune of 33, 851 gallons per weekday (Figure 1). Table 3 shows that there are 19, 415 SOVs in the region operated by residents in the $30, 000+ income group who could be persuaded to carpool with another resident (HOV2). In addition, another 12, 884 residents are potential targets for HOV3+ carpooling. Given these numbers, the potential for savings in gasoline consumption is 46, 413 gallons per week day / working day (Table 3).

Figure 1: Fossil-Fuel Consumption: Savings from Carpooling on an Average Weekday



Strategies to achieving potential savings in fossil-fuel consumption include improvements of infrastructure for public transport services, increased costs for car use, rationing of car use, etc. Some of these "hard" measures are difficult to implement because of public opposition or economic / political infeasibility (Jones, 2003). Interest has therefore shifted to "soft" policy measures which are based on psychological approaches to influence car users to voluntarily switch to sustainable travel modes (Taylor, 2007).

A recent meta-analysis of car-use reduction posits that advertising campaigns aimed at enhancing the awareness of residents about threats to human environment from cars resulted in 11% decrease in the proportion of trips conducted by car (Moser and Bamberg, 2008). Based on this evidence, we recommend that rural communities engage in mass advertising campaign aimed at reducing car use.

A basic requirement for any advertising campaign is the definition of target audiences for the campaign and assessment of target-audience leverage (Rossiter and Percy, 1997). Our four income segments constitute the target audiences. Regarding "leverage" of the segments, we assess it using the ratio:

$$\frac{\text{Expected decrease in fossil} - \text{fuel consumption (in dollars) in the segment}}{\text{Communications expenditure we would have to incur to get those reductions}}$$

Table 4 presents the communications-leverage information for the segments. As shown in the Table, leverage is highest for the HOV2 segment. Targeting this segment to carpool would create a net savings of approximately $1.25 million in fossil-fuel consumption in the region.

As regards the type of message to be broadcast, the theoretical issue-management strategies suggested by Tybout, Calder, and Sternthal (1981) provide guidelines. Specifically, it is suggested that the negative attributes of carpooling be outflanked with the concept's positive attributes. To elaborate, Li et al (2007) posit that flexibility requirements (for instance, travel at any time) motivates people ***not*** to carpool. Put another way, "need for flexibility" is a negative attribute of carpooling and to lessen its impact, it is suggested that the target audiences be reminded of carpooling's positive attributes such as relaxation while travelling, get-work-done while travelling, help environment, sharing vehicle expenses, etc.

Table 3: Energy Savings from Carpools: Actual and Potential

(i) **2009 Estimates**

	2009				
	Number of Cars (SOVs)		**Savings from Carpool per Trip**		
Segment Label	**With Carpool**	**Without Carpool**	**Total Miles**	**Total Gallons of Gasoline**	**Estimated Savings (@$2.296 / Gallon**
HOV2 ***Income***: $30, 000 +	19,415	23,235	485,375	17,650	$40,524
HOV3 ***Income***: $27, 500 to $30, 000	2,455	3,210	73,650	2,678	$6,149
HOV4 ***Income***: $25, 000 to $27, 500	2,560	2,948	76,800	2,793	$6,412
HOV5+ ***Income***: < $25, 000	7,869	7,926	295,088	10,730	$24,637

Note: In computing these numbers, we assumed the following:
(i) Vehicles are powered by internal combustion engines at 4.368 MegaJoule per mile (Strickland, 2011);
(ii) The average fuel efficiency is 27.5 miles / gallon;
(iii) Average miles travelled to work by the segments, calculated from Census data, are:
(a) 25 for HOV2; (b). 30 for HOV3, and HOV4, and (c) 37.5 for HOV5+
(iv). Per gallon gasoline prices were obtained from http://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_r20_a.htm

(ii) **Potential**

	Potential – 2011 and Beyond				
	Number of Cars (SOVs)		**Savings from Carpool per Trip**		
Segment Label	**With Carpool**	**Without Carpool**	**Total Miles**	**Total Gallons of Gasoline**	**Estimated Savings @$2.73 / Gallon**
HOV2 ***Income***: $30, 000 +	9,708	19,415	24,2688	8,825	$24,092
HOV3 ***Income***: $27, 500 to $30, 000	818	2,455	24,550	893	$2,437
HOV4 ***Income***: $25, 000 to $27, 500	640	2,560	19,200	698	$1,906
HOV5+ ***Income***: < $25, 000	1,574	7,869	59,018	2,146	$5,859

Table 4: Carpool Segments and Media: Demographic Matching and Leverage

Segment Label	**Media Vehicles**	**Communication Leverage** (Media vehicles would be local newspapers such as the *Macomb Eagle* in McDonough County)
HOV2.	*Magazines*: In general, news-and- entertainment weeklies, and distributed newspapers are read by 46% of the segment. *Internet*: Majority has yahoo mail (51%).	$ 1,247,865
HOV3	*Magazines*: 46% read distributed newspapers. *Internet*: 46% browse Facebook.com, 37% watch YouTube videos, and 36% connect to Yahoo mail	$ 96, 674
HOV4	*Magazines*: 46% read distributed newspapers. *Internet*: 43% visit Facebook.com, 35% connect to Yahoo mail, and 34% watch YouTube.	$ 81,591
HOV5+	*Magazines*: 47% read distributed newspapers. *Internet*: 43% visit Facebook.com, 36% has Yahoo mail, and 34% visit YouTube.	$ 442, 185

Note: Leverage = [number of individuals x prob. of carpooling x savings in gasoline consumption – cost of marketing communication]. We assume a frequency of 1 full-page ad per month to create awareness (and positive attitude) about carpooling, in each of the county newspapers, at a cost of $12, 000 per year / newspaper.

VI. SUMMARY AND COCNLUSION

This paper is in response to call for research into carpooling in rural communities (Burbank and Brinckerhoff, 2009). There are at least four carpooling clusters in rural Illinois. They are income-based clusters and their likelihoods to carpool are:

Segment 1 (HOV2; Median Income = $30, 000+): **0.19**;
Segment 2 (HOV3; Median Income = $27, 500 to $30,000): **0.15**;
Segment 3 (HOV4; Median Income = $25, 000 to $27,500): **0.13**, and
Segment 4 (HOV5+; Median Income = Less than $25, 000): **0.12**

In 2009, 11% of the region's working population (n = 5040) carpooled. This resulted in reduction in fossil-fuel consumption of around 8.8 million gallons. Implementing the marketing communication strategy outlined in this paper could increase this number to 12.06 million gallons per annum.

Private car use is a threat to the human environment (Garling and Steg, 2007). It is time rural communities implement policies such as the one highlighted in this paper to reduce car usage.

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Appendix 1: National Carpool Data

	Total '000	Pct Down
Total	228112	100
Women	117804	51.2
Educ: graduated college plus	61723	31
Educ: attended college	63819	29.4
Educ: graduated high school	70358	23.2
Educ: did not graduate HS	32211	16.4
Educ: post graduate	21647	9.3
Educ: no college	102570	39.6
Age 18-24	28815	28.5
Age 25-34	40710	25
Age 35-44	41552	17.9
Age 45-54	44605	18.2
Age 55-64	34456	5.3
Age 65+	37973	5.1
Adults 18-34	69525	53.5
Adults 18-49	133917	80.4
Adults 25-54	126867	61.1
Men 18-34	35026	28.3
Men 18-49	66781	39.5
Men 25-54	62888	28.9
Women 18-34	34499	25.3
Women 18-49	67136	40.9
Women 25-54	63979	32.2
Occupation: Professional and Related Occupation	30595	17.4
Occupation: Management, Business and Financial Operations	20800	10.2
Occupation: Sales and Office Occupation	32505	14.8
Occupation: Natural Resources, Construction and Maintenance Occupation	13013	3.7
Occupation: Other employed	40225	18.9
HHI $150,000+	24324	14.4
HHI: $75,000-$149,999	65194	32.9
HHI: $60,000-$74,999	24989	9.1
HHI: $50,000-$59,999	18503	7.4
HHI: $40,000-$49,999	20079	6.4
HHI: $30,000-$39,999	22036	6.8
HHI: $20,000-$29,999	22396	11.2
HHI: <$20,000	30591	11.7
Census Region: North East	41697	10.5
Census Region: South	84310	30.2
Census Region: Midwest	50012	16.5
Census Region: West	52092	42.8