Who Likes Traveling?

Models of the Individual's Affinity for Various Kinds of Travel

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TABLE OF CONTENTS

DOCUMENTS PRODUCED BY ATTITUDES TOWARDS MOBILITY PROJECT

Journal Articles Produced by this Project to Date

Cao, Xinyu and Patricia L. Mokhtarian (forthcoming) How do individuals adapt their personal travel? A conceptual exploration of the consideration of travel-related strategies. *Transport Policy*.

Cao, Xinyu and Patricia L. Mokhtarian (forthcoming) How do individuals adapt their personal travel? Objective and subjective influences on the consideration of travel-related strategies. *Transport Policy*.

Choo, Sangho and Patricia L. Mokhtarian (2004) How do people respond to congestion policies? Exploring the individual consideration of travel-related strategy bundles. Under review for publication.

Choo, Sangho and Patricia L. Mokhtarian (2004) What type of vehicle do people drive? The role of attitude and lifestyle in influencing vehicle type choice. *Transportation Research A* **38(3)**, 201-222.

Choo, Sangho, Gustavo O. Collantes, and Patricia L. Mokhtarian (forthcoming) Wanting to travel, more or less: Exploring the determinants of a perceived deficit or surfeit of personal travel. *Transportation*.

Clay, Michael J. and Patricia L. Mokhtarian (2004) Personal travel management: The adoption and consideration of travel-related strategies. *Transportation Planning and Technology* **27(3)** (June).

Collantes, Gustavo O. and Patricia L. Mokhtarian (2002) Qualitative subjective assessments of personal mobility: Exploring the magnifying and diminishing cognitive mechanisms involved. Under review for publication.

Handy, Susan L., Lisa Weston, and Patricia L. Mokhtarian (2003) Driving by choice or necessity? The case of the soccer mom and other stories. Paper presented at the 82nd annual meeting of the Transportation Research Board, Washington, DC, January, draft available on conference CD-ROM.

Handy, Susan L., Lisa Weston, and Patricia L. Mokhtarian (2004) Driving by choice or necessity? (later version of 2003 paper) Manuscript under review for publication.

Mokhtarian, Patricia L., Ilan Salomon, and Lothlorien S. Redmond (2001) Understanding the demand for travel: It's not purely "derived". *Innovation: The European Journal of Social Science Research* **14(4)**, 355-380.

Mokhtarian, Patricia L. and Ilan Salomon (2001) How derived is the demand for travel? Some conceptual and measurement considerations. *Transportation Research A* **35(8)**, 695-719.

Ory, David T. and Patricia L. Mokhtarian (2004) When is getting there half the fun? Modeling the liking for travel. Manuscript under review for publication.

Ory, David T., Patricia L. Mokhtarian, Ilan Salomon, Lothlorien S. Redmond, Gustavo O. Collantes, and Sangho Choo (2004) When is commuting desirable to the individual? *Growth and Change* **35(3)** (Summer), special issue on Advances in Commuting Studies, Peter Nijkamp and Jan Rouwendal, eds., 334-359.

Redmond, Lothlorien S. and Patricia L. Mokhtarian (2001) The positive utility of the commute: Modeling ideal commute time and relative desired commute amount. *Transportation* **28(2)** (May), 179-205.

Salomon, Ilan and Patricia L. Mokhtarian (1999) Travel for the fun of it. *Access* (a publication of the University of California Transportation Center) **15** (Fall), 26-31. Available at www.uctc.net/access/access15.pdf or (without graphics) .../access15lite.pdf.

Salomon, Ilan and Patricia L. Mokhtarian (1998) What happens when mobility-inclined market segments face accessibility-enhancing policies? *Transportation Research D* **3(3)**, 129-140.

Salomon, Ilan and Patricia L. Mokhtarian (2002) Driven to travel: The identification of mobility-inclined market segments. Chapter 22 in William R. Black and Peter Nijkamp, eds., *Social Change and Sustainable Transport*. Bloomington, IN: Indiana University Press, pp. 173-179. Included in the Regional Futures Compendium of the Capital Region Institute (Valley Vision), Sacramento, California.

Schwanen, Tim and Patricia L. Mokhtarian (2004) The extent and determinants of dissonance between actual and preferred residential neighborhood type. *Environment and Planning B*.

Schwanen, Tim and Patricia L. Mokhtarian (2003a) Does dissonance between desired and current neighborhood type affect individual travel behaviour? An empirical assessment from the San Francisco Bay Area. *Proceedings of the European Transport Conference (ETC)*, October 8-10, 2003, Strasbourg, France.

Schwanen, Tim and Patricia L. Mokhtarian (2003b) The role of attitudes toward travel and land use in residential location behavior: Some empirical evidence from the San Francisco Bay Area. Under review for publication.

Schwanen, Tim and Patricia L. Mokhtarian (forthcoming) What affects commute mode choice: Neighborhood physical structure or preferences toward neighborhoods? *Journal of Transport Geography.*

Schwanen, Tim and Patricia L. Mokhtarian (2004) What if you live in the wrong neighborhood? The impact of residential neighborhood type dissonance on distance traveled. Under review for publication.

Reports Produced by this Project to Date

Cao, Xinyu and Patricia L. Mokhtarian (2003) *Modeling the Individual Consideration of Travel-Related Strategies*. Research Report UCD-ITS-RR-03-3, Institute of Transportation Studies, University of California, Davis, June.
Available at www.its.ucdavis.edu/publications/2003/RR-03-3.pdf.

Choo, Sangho and Patricia L. Mokhtarian (2002) *The Relationship of Vehicle Type Choice to Personality, Lifestyle, Attitudinal, and Demographic Variables*. Research Report, Institute of Transportation Studies, University of California, Davis, October.
Available at www.its.ucdavis.edu/publications/2002/RR-02-06.pdf.

Choo, Sangho and Patricia L. Mokhtarian (2004) *Modeling the Consideration of Travel-Related Strategy Bundles*. Research Report, Institute of Transportation Studies, University of California, Davis, April.
Available at http://www.its.ucdavis.edu/publications/2004/UCD-ITS-RR-04-07.pdf.

Choo, Sangho, Gustavo O. Collantes, and Patricia L. Mokhtarian (2001) *Modeling Individuals' Relative Desired Travel Amounts*. Research Report UCD-ITS-RR-01-13, Institute of Transportation Studies, University of California, Davis, November.
Available at www.its.ucdavis.edu/publications/2001/RR-01-13.pdf.

Clay, Michael J. and Patricia L. Mokhtarian (2002) *The Adoption and Consideration of Commute-Oriented Travel Alternatives*. Research Report UCD-ITS-RR-02-04, Institute of Transportation Studies, University of California, Davis, September.
Available at www.its.ucdavis.edu/publications/2002/RR-02-04.pdf.

Collantes, Gustavo O. and Patricia L. Mokhtarian (2002) *Determinants of Subjective Assessments of Personal Mobility*. Research Report, Institute of Transportation Studies, University of California, Davis, August.
Available at www.its.ucdavis.edu/publications/2002/RR-02-11.pdf.

Curry, Richard W. (2000) *Attitudes toward Travel: The Relationships among Perceived Mobility, Travel Liking, and Relative Desired Mobility.* Master's Thesis, Department of Civil and Environmental Engineering, University of California, Davis, June. Research Report UCD-ITS-RR-00-06, Institute of Transportation Studies, University of California, Davis. Available at www.its.ucdavis.edu/publications/2000/RR-00-06.pdf.

Ory, David T. and Patricia L. Mokhtarian (2004) *Who Likes Traveling? Models of the Individual's Affinity for Various Kinds of Travel*. Research Report UCD-ITS-RR-04-xx, Institute of Transportation Studies, University of California, Davis, June.

Redmond, Lothlorien S. and Patricia L. Mokhtarian (2001) *Modeling Objective Mobility: The Impact of Travel-Related Attitudes, Personality, and Lifestyle on Distance Traveled*. Research Report UCD-ITS-RR-01-09, Institute of Transportation Studies, University of California, Davis, June. Available at http://repositories.cdlib.org/itsdavis/UCD-ITS-RR-01-09/

Redmond, Lothlorien S. (2000) *Identifying and Analyzing Travel-related Attitudinal, Personality, and Lifestyle Clusters in the San Francisco Bay Area.* Master's Thesis, Transportation Technology and Policy Graduate Group, Institute of Transportation Studies, University of California, Davis, September. Research Report UCD-ITS-RR-00-08. Available at www.its.ucdavis.edu/publications/2000/RR-00-08.pdf

LIST OF TABLES AND FIGURES

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EXECUTIVE SUMMARY

Do people actually like traveling? According to conventional wisdom, the answer is no: travel is simply a means to the desired end of participating in spatially-separated activities. However, substantial evidence (Albertson, 1977; Beroldo, 2002; Edmonson, 1998; Larson, 1998; Mokhtarian and Salomon, 1997; Richter, 1990; Higano and Orishimo, 1990; Shamir, 1991) suggests that travel does more than play this purely utilitarian role. Rather, travel has some qualities, such as an opportunity to mentally switch from the work realm to the personal realm of daily life or to move quickly through space, that are desirable in themselves.

This report is part of an ongoing research program investigating the mobility and attitudes towards travel of individuals. The portion of the research presented here derives relationships between measures of Travel Liking (how much an individual likes travel, differentiated by trip purpose, mode, and length) and other variables in the data. The data set contains 1,358 residents of three neighborhoods in the San Francisco Bay Area, who work part- or full-time and commute with some regularity.

A key premise of the entire research effort is that while individuals travel primarily to participate in spatially-separated activities, there is an additional component driving some travel. We believe individuals have a positive utility both for travel itself (e.g. the sensation of motion and movement through space that travel provides) and for activities that can be conducted while traveling (e.g. listening to music, talking on the telephone). A primary goal of the research effort as a whole is to better understand the causes and motivations of this affinity for travel. The modeling of Travel Liking is a key piece in this effort.

The types of variables in the data set can be segmented into ten general categories, namely: Objective Mobility, Subjective Mobility, Relative Desired Mobility, Travel Liking, Attitudes, Personality, Lifestyle, Excess Travel, Mobility Constraints, and Socio-demographics. Ultimately, the broader research project will develop structural equations models to account for the many interrelationships present among these variable groups. To more fully explore these relationships, we first use single equation models for the major endogenous variable categories, namely: Objective Mobility, Subjective Mobility, Travel Liking, and Relative Desired Mobility. This report focuses on the single equation models for Travel Liking; previously published companion reports and papers discuss the single equation models for the other three key

endogenous variables (see the list of Documents Produced by the Attitudes towards Mobility Project at the front of this report).

Before examining the estimated single equation models of the Travel Liking variables, it is interesting to look directly at the dependent variables. The Travel Liking measures (varied by distance, purpose, and mode) were captured in the survey by the following question: “How do you feel about *traveling* in each of the following categories? We are *not* asking how you feel about the activity at the destination, but about the travel required to get there. Even if you seldom or never travel in a certain category, you may still have a feeling about it.” Table ES.1 summarizes the short-distance (one-way trips of less than 100 miles) Travel Liking responses for those (so-called working-commuters, as defined previously) analyzed in this study. The results (at least in the absence of comparable data for other societies) support the stereotype of car-loving Americans, in that only the non-motorized category of travel (walking/jogging/bicycling) received more “like” and “strongly like” responses than the personal vehicle category. Also of interest is the relative contentment of most people (even in this sample of residents of the highly urbanized San Francisco metropolitan area) with commute travel, where only about 40 percent indicated any level of dislike.

Table ES.1: Short-Distance Travel Liking Dependent Variables (N=1,358)

Travel Liking Variable		Strongly dislike	Dislike	Neutral	Like	Strongly like
Overall	**N**	15	178	762	360	43
	%	1.1	13.1	56.1	26.5	3.2
Commute	**N**	123	424	520	254	37
	%	9.1	31.2	38.3	18.7	2.7
Work/School-Related	**N**	64	292	749	227	26
	%	4.7	21.5	55.2	16.7	1.9
Entertain./Social/ Recreation	**N**	6	66	543	605	138
	%	0.4	4.9	40.0	44.6	10.2
Personal Vehicle	**N**	34	125	410	647	142
	%	2.5	9.2	30.2	47.6	10.5
Bus	**N**	389	473	384	103	9
	%	28.6	34.8	28.3	7.6	0.7
Rail	**N**	161	231	540	384	42
	%	11.9	17.0	39.8	28.3	3.1
Walk/Jog/Bicycle	**N**	54	66	332	663	243
	%	4.0	4.9	24.4	48.8	17.9

The Travel Liking responses for long-distance travel are presented in Table ES.2. Overall travel is viewed favorably by most, as is travel by airplane and for entertainment/social/recreation purposes. While these results may seem intuitive to some, they bring forth myriad questions: What is generating a liking for personal vehicle travel? The sense of freedom it brings? A need to be alone? A desire for status? What is driving dislike for work/school-related long-distance travel? Too much travel? Attempting to answer these types of questions is precisely the motivation for estimating models of Travel Liking.

Table ES.2: Long-Distance Travel Liking Dependent Variables (N=1,358)

Travel Liking Variable		Strongly dislike	Dislike	Neutral	Like	Strongly like
Overall	**N**	19	119	368	671	181
	%	1.4	8.8	27.7	49.4	13.3
Work/School-Related	**N**	153	331	576	267	31
	%	11.3	24.4	42.4	19.7	2.3
Entertain./Social/ Recreation	**N**	23	83	320	597	335
	%	1.7	6.1	23.6	44.0	24.7
Personal Vehicle	**N**	48	211	420	563	116
	%	3.5	15.5	30.9	41.5	8.5
Airplane	**N**	54	130	272	632	270
	%	4.0	9.6	20.0	46.5	19.9

The Travel Liking measures are potentially a function of all the variable categories in the dataset save Relative Desired Mobility (which, as an indicator of desired change, we take to be the final outcome of influences such as Lifestyle, Mobility, and Travel Liking). The general hypothesis underlying the models is that Travel Liking measures will primarily be a function of the Attitude, Personality, and Lifestyle variables. In essence, we hypothesize that through intrinsic human nature and life experiences, individuals develop various degrees of a desire for, and liking of, travel. Once these attitudes and personalities are developed, they will dominate the liking for travel. While we expect that the amount of travel an individual engages in from day to day will play a role in either reinforcing or contradicting existing beliefs, it will not be the key determinant of Travel Liking. For example, if an individual is forced (taking work travel to be mandatory) to commute long distances as a result of her residential and workplace location choices, she may begin to dislike travel in an automobile. However, we do not expect that this factor will be a more powerful explanatory variable than the measures of Attitude, Personality, and Lifestyle in the data set. Similarly, while we certainly expect Socio-Demographic variables to play a role in

the explanation of Travel Liking, Socio-Demographics are not anticipated to be strong explanatory variables. For example, while it is expected that those with high incomes may not like to travel long distances in automobiles, we do not expect this variable to be more important than Attitude measures. In fact, unlike travel behavior itself (which is strongly related to socio-demographic traits), we expect the Liking for at least some types of travel to be relatively independent of such variables.

A summary of the Travel Liking models is presented in Table ES.3 and Table ES.4. A total of 13 models are estimated using ordinary least-squares regression – eight for short-distance travel and five for long-distance travel. The short-distance models include the following categories of travel: overall, commute to work/school, work/school-related, entertainment/recreation/social, personal vehicle, bus, rail, and walk/jog/bicycle; the long-distance models include: overall, work/school-related, entertainment/recreation/ social, personal vehicle, and airplane. The adjusted R^2 values range from 0.346 to 0.106, which, while not low for disaggregate travel models, indicates the difficulty in explaining a variable that measures individuals' liking. Interestingly, the model with the highest R^2 value is the model of commute Travel Liking and, importantly, little of this model's explanatory power is found in objective measures of commute distance and time (meaning, commute dislike is not simply due to having a long commute, or conversely).

For the most part, the model results confirm our primary hypothesis in that the majority of explanatory power in the models is provided by the Attitude, Personality, and Lifestyle variables (see the tables in Section 3 for detailed model estimates). In fact, all six of the Attitude factor score variables were significant in at least one of the models, as were all four of the Lifestyle factor score variables and three of four Personality factor scores.

This report directly addresses the positive utility of travel recently articulated by Salomon and Mokhtarian (1998) and Mokhtarian and Salomon (2001), among others. Salomon and Mokhtarian (1998, p. 136) hypothesized that in "some people and in some contexts, travel for its own sake is valued due to one or more … character traits or desires"; they went on to list a number of specific traits/desires. In Table ES.5 we compare these hypothesized traits/desires, along with two other traits (curiosity and escape/therapy) not included in the 1998 paper, with the results from the Travel Liking models presented in this report. The table indicates generally strong support for all originally hypothesized traits (note that several variables in the models relate to more than one trait). Although, after all, the survey was designed specifically to capture

a number of these traits, it is noteworthy that Travel Liking arises from such a variety of sources. The most important positively associated factors appear to be status, independence, curiosity and variety-seeking, and the escape/therapeutic benefits of traveling, as well as a craving for transition time between work and home and the synergy effects of trip chaining. The most important negatively associated variables were travel dislike and travel stress. These factors represent reasons why travel is generally expected to be a disutility, but viewed in the opposite way, it can be said that a positive Travel Liking is partly defined by a person's *refusal* to see travel as boring, stressful, unsafe, and so on.

The general conclusion from the modeling is that attitudes and personality are important factors in describing travel behavior. The previous single-equation models of Objective Mobility, Subjective Mobility and Relative Desired Mobility indicated Travel Liking measures to be key explanatory variables. Here, Travel Liking is shown to be primarily a function of Attitude, Lifestyle, and Personality variables. Just as previous research suggested that attitudes are an important factor in mode choice (those who do not like public transit, for whatever reason, probably will not choose a transit mode even if it offers better service than an automobile), the research presented here, along with the companion Objective Mobility, Subjective Mobility, and Relative Desired Mobility reports, suggests that attitudes towards travel itself, along with inherent differences in personality and lifestyle, can influence the amount of travel in which an individual engages, or wishes to engage. Such results have important policy implications as they offer increased insight into why not all individuals will react similarly when faced with travel-reducing policies, such as the promotion of telecommuting alternatives.

Table ES.3: Summary of Short-Distance Travel Liking Models

Explanatory variables		Dependent variable (adjusted R-squared): Travel Liking for…							
Category	**Variable**	Overall (0.214) N=1321	Cmt. (0.346) N=1339	Work/ Sch-rel (0.143) N=1351	Ent/Rec (0.118) N=1327	Pers veh (0.182) N=1344	Bus (0.170) N=1319	Rail (0.182) N=1295	Walk, etc. (0.196) N=1299
Objective Mobility	Weekly commuting distance (miles) [0,800]	-	-						
	Weekly total SD travel (miles) [5,1500]					-			
	Commute mode dummy – bus or ferry [0,1]		-						
	Commute mode dummy – rail [0,1]				+				
	One-way commute time (minutes) [2,130]		-						
	One-way commute distance (miles) [0,…,108]						+	+	
	Weekly travel by other means (miles) [0,600]			-					
	Past year (log) total long distance miles [0,12.8]*					-			
Subj. Mob.	Overall short distance travel [1,…,5]		-						
Attitude	Travel dislike factor score [-1.8,3.7]	-			-	-			-
	Travel stress factor score [-1.9,2.9]				-				
	Commute benefit factor score [-2.9,2.6]	+	+	+		+	+	+	
	Travel freedom factor score [-3.0,2.3]	+	+	+		+			
	Pro-environ. solutions factor score [-2.3,2.4]					-	+	+	+
	Pro-high density factor score [-2.5,2.3]				-	-	+	+	
Lifestyle	Family/com-related factor score [-3.9,2.1]		-	-	+			+	+
	Status seeker factor score [-1.7,2.7]	+		+	+	+			
	Workaholic factor score [-2.1,2.7]						+		
	Frustrated factor score [-2.0,2.7]				-				
Personality	Organizer factor score [-2.90,2.6]						-	-	
	Calm factor score [-2.9,2.4]			+	+		+		
Excess Travel [1,2,3]	How often do you travel … just to relax	+							
	… to clear your head								+
	… to explore new places				+				+
	… when you need time to think				+				
	… by a longer route to exp. more of your srndgs.					+			+
	... mainly to be alone		+	+					
Mobility Limit. [1,2,3]	Conditions which prevent or limit air travel							+	
	Conditions which prevent or limit public transit						-	-	
	Conditions which prevent or limit bicycle						+	+	
Socio-Demo-graphic	Luxury vehicle type dummy [0,1]							-	
	Minivan vehicle type dummy [0,1]								-
	Suburban dummy [0,1]	+							
	Concord dummy [0,1]								-
	Sales occupation dummy [0,1]							+	
	Professional occupation dummy [0,1]	-							
	Personal income category [1,…,6]	-			-		-		
	Number of persons age 6-15 in HH [0,…,3]			+					
	Number of persons age 24-40 in HH [0,…,7]		-						+
	Number of persons age 41-64 in HH [0,…,3]	+							
	Number of persons age 65-74 in HH [0,1,2]								-
	Number of persons in HH [1,…,8]		+				+		
	Single adult with children family status dmy [0,1]								+
	Female [0,1]					+		-	
	Educational background [1,…,6]							+	+

Notes: [ ] represents variable range; HH = household; SD = short distance; * Logarithm (miles +1) to avoid taking the log of zero

Table ES.4: Summary of Long-Distance Travel Liking Models

Explanatory variables		Dependent variable [adjusted R-squared]: Travel Liking for…				
Category	**Variable**	Overall[i] [0.206]	Work related[j] [0.106]	Ent. / soc. / rec.[k] [0.183]	Personal vehicle [0.178][l]	Airplane[m] [0.149]
Obj. Mobility	Past year work-related long-distance trips [0,230]	-				
Subjective Mobility	Long-distance work/school-related travel [1,…,5]					-
	Long-distance airplane travel [1,…,5]				-	
Attitude	Travel dislike factor score [-1.8,3.7]	-	-	-	-	-
	Travel stress factor score [-1.9,2.9]	-	-	-	-	-
	Commute benefit factor score [-2.9,2.6]				+	
	Pro-high density factor score [-2.5,2.3]		+		-	
Lifestyle	Family/community-related factor score [-3.9,2.1]			+		+
	Status seeker factor score [-1.7,2.7]	+	+		+	
	Workaholic factor score [-2.1,2.7]		+			
Personality	Adventure seeker factor score [-2.6,2.7]					+
Excess Travel [1,2,3]	… to explore new places	+		+		
	… when you need time to think			+		
	… out of your way to see beautiful scenery				+	
Mobility Limit.	Conditions which prevent or limit air travel [1,2,3]					-
Socio-Demographic	Number of full-time workers in HH [0,…,6]				-	
	Management/administrator occupation dummy [0,1]		+			
	Production-construction-crafts occupation dummy [0,1]					-
	Personal income category [1,…,6]				-	
	Number of persons age 24-40 in HH [0,…,7]			+		
	Number of persons age 41-64 in HH [0,…,3]				+	
	Two or more adults with children family status dummy [0,1]		+			
	Single adult without children family status dummy [0,1]			+		
	Educational background [1,…,6]		+			

Notes: [ ] represents variable range; N = 1345[i], 1356[j], 1351[k], 1318[l], 1354[m]; HH = household

Table ES.5: Comparison of Hypotheses and Travel Liking Model Results

Hypothesized trait or desire	Evidence in TL Models?	Travel Liking Model(s)	Explanatory Variable Category	Explanatory Variable
Adventure- or variety-seeking	Yes	LD Airplane	Personality	Adventure-seeking factor score
		SD Entertainment, SD Walk, LD Overall, LD Entertainment	Excess Travel	How often do you travel to explore new places?
Independence	Yes	SD Overall, SD Commute, SD Work/School-Related, SD Personal vehicle	Attitude	Travel freedom factor score
Control	Somewhat	SD Bus, SD Rail	Personality	Organizer factor score (negative direction)
Status	Yes	SD Overall, SD Work/School-Related, SD Entertainment, SD Personal vehicle, LD Overall, LD Work-related, LD Personal vehicle	Lifestyle	Status seeker factor score
		SD Rail	Socio-Demographics	Luxury vehicle type (negative direction)
Buffer	Yes	SD Overall, SD Commute, SD Work/School-Related, SD Personal vehicle, SD Bus, SD Rail, LD Personal vehicle	Attitude	Commute benefit factor score
Exposure to the environment	Yes	SD Personal vehicle, SD Walk	Excess Travel	How often do you travel by a longer route to experience more of your surroundings?
Scenery or other amenities	Yes	SD Personal vehicle, SD Walk	Excess Travel	… by a longer route to experience more of your surroundings?
		LD Personal vehicle	Excess Travel	… out of your way to see beautiful scenery?
Synergy (multiple activities)	Yes	SD Overall, SD Commute, SD Work/School-Related, SD Personal vehicle, SD Bus, SD Rail, LD Personal vehicle	Attitude	Commute benefit factor score
Curiosity	Yes	SD Entertainment, SD Walk, LD Overall, LD Entertainment	Excess Travel	How often do you travel to explore new places?
		SD Personal vehicle, SD Walk	Excess Travel	… by a longer route to experience more of your surroundings?
Escape/Therapy	Yes	SD Entertainment, LD Entertainment	Excess Travel	… when you need time to think?
		SD Commute, SD Work/School-Related	Excess Travel	… mainly to be alone?
		SD Overall	Excess Travel	… just to relax?
		SD Walk	Excess Travel	… to clear your head?
		SD Work/School-Related	Socio-Demographic	Number of persons age 6-15 in household
		LD Work-related	Socio-Demographic	Two or more adults with children family status

Notes: SD = Short-distance, LD = Long-distance, TL = Travel Liking, Walk = walk/jog/bicycle, Entertainment = entertainment/recreation/social

1. INTRODUCTION

1.1 Background

This report is part of a larger research program investigating the relationships among attitudes, personality, and travel. A key premise of the entire research effort is that while individuals travel primarily to participate in spatially-separated activities, there is an additional component driving some travel. We believe individuals have a positive utility both for travel itself (e.g. the sensation of motion and movement through space which travel provides) and for activities that can be conducted while traveling (e.g. listening to music, talking on the telephone). The primary goals of the research effort as a whole are to better understand both the causes/motivations of this affinity for travel, and its effects on travel and related indicators. Prior reports and papers produced by this study (see the list provided in the front of this report) have investigated effects of an affinity for travel by including explicit measures of Travel Liking (among other variables) in models of Objective Mobility (the amount people actually travel), Subjective Mobility (peoples' qualitative perception of the amount they travel), and Relative Desired Mobility (qualitative measures of how much people want to travel relative to their current amounts). The Liking for travel has been an important influence in most of those models. Given that importance, it becomes critical to better understand this affinity for travel: What kinds of people have it, under what circumstances? This report directly examines the causes of individuals' liking for travel by using ordinary least-squares regression to model the relationship between Travel Liking and other variables in our data set.

Thus, while an exploration of individuals' pure affinity for travel is interesting in its own right, this investigation fits into a broader context. Figure 1.1 presents a conceptual model of an individual's affinity for travel as modified by a collection of exogenous variables and four key endogenous variables (shown in bold type face). Each box denotes a category of variables, which is operationalized through a number of different specific measures. One end goal for the (larger) research program is to develop a structural equations model, which will represent the directional relationships between the endogenous variables identified. At this point in the study, each key endogenous variable in Figure 1.1 (namely Objective Mobility, Subjective Mobility, Travel Liking, and Relative Desired Mobility) is being examined individually.

Examining the conceptual model, it is noticed that the Mobility Constraints variables (mental or physical limitations on individuals' ability to fly, walk, bicycle, ride public transit, drive, drive at

night, or drive on a freeway) are the only completely exogenous set of variables in the model. While some Socio-Demographic variables are clearly exogenous (i.e. age, gender), others could be influenced by any number of variables (e.g. residential location may be a function of attitudes). Similarly, Attitudes may be intrinsic or influenced by life-stage or other Socio-Demographics; Personality may also be intrinsic, but (at least as we have operationalized it in this study) could be related to income or gender, for example, as well.

The four key endogenous variables – Travel Liking, Subjective Mobility, Objective Mobility, and Relative Desired Mobility – have been identified as interesting and important measures of travel behavior. Objective Mobility comprises common measures used by regional planning organizations in modeling exercises that have the typical end goal of predicting daily travel amounts. Subjective Mobility is of great interest because two individuals who travel the same objective distance may not consider their amounts of travel to be the same – as such, they may respond differently to travel-reducing policies. Relative Desired Mobility is a sort of end-outcome to all the other variables, resulting in a desire to travel more or less than the current amount. All these variables are related to the measure discussed in this report – Travel Liking – whose investigation aims to answer such questions as: What type of person enjoys traveling? Do some people actually enjoy their daily commute? If so, what kinds of people are they? Are they more likely to be driving a car? Are they more likely to be wealthy? Understanding what types of individuals enjoy or don't enjoy travel could have substantial policy implications. Any policy aimed at reducing the use of a good or service that a significant segment of the population "likes" (especially if that liking were largely independent of travel amounts) would certainly be more difficult, and probably less successful, than reducing the use of a uniformly despised good or service.

In developing the current set of single-equation models of Travel Liking, we do not limit ourselves to relationships shown in the conceptual model of Figure 1.1 (which in any case is not necessarily considered to be final). For example, while we hypothesize that the impact of Objective Mobility on Travel Liking occurs only through the impact of Objective Mobility on Subjective Mobility and then Subjective Mobility on Travel Liking, at this stage of the study we allow Objective Mobility to enter the models directly as well. Such variables, if significant, may be capturing residual effects due to error in our measurement of Subjective Mobility and/or in our specification of the functional form of the relationship, as well as indirect effects of other variables (unobserved as well as observed). It should be noted that the single-equation approach is subject to simultaneity bias due to the inclusion of variables endogenous to the

conceptual model as explanatory variables. As such, the model results may be viewed as suggestive rather than definitive. However, the single-equation models do offer insight into the individual measures of travel behavior and greatly aid in the end goal of structural equations modeling.

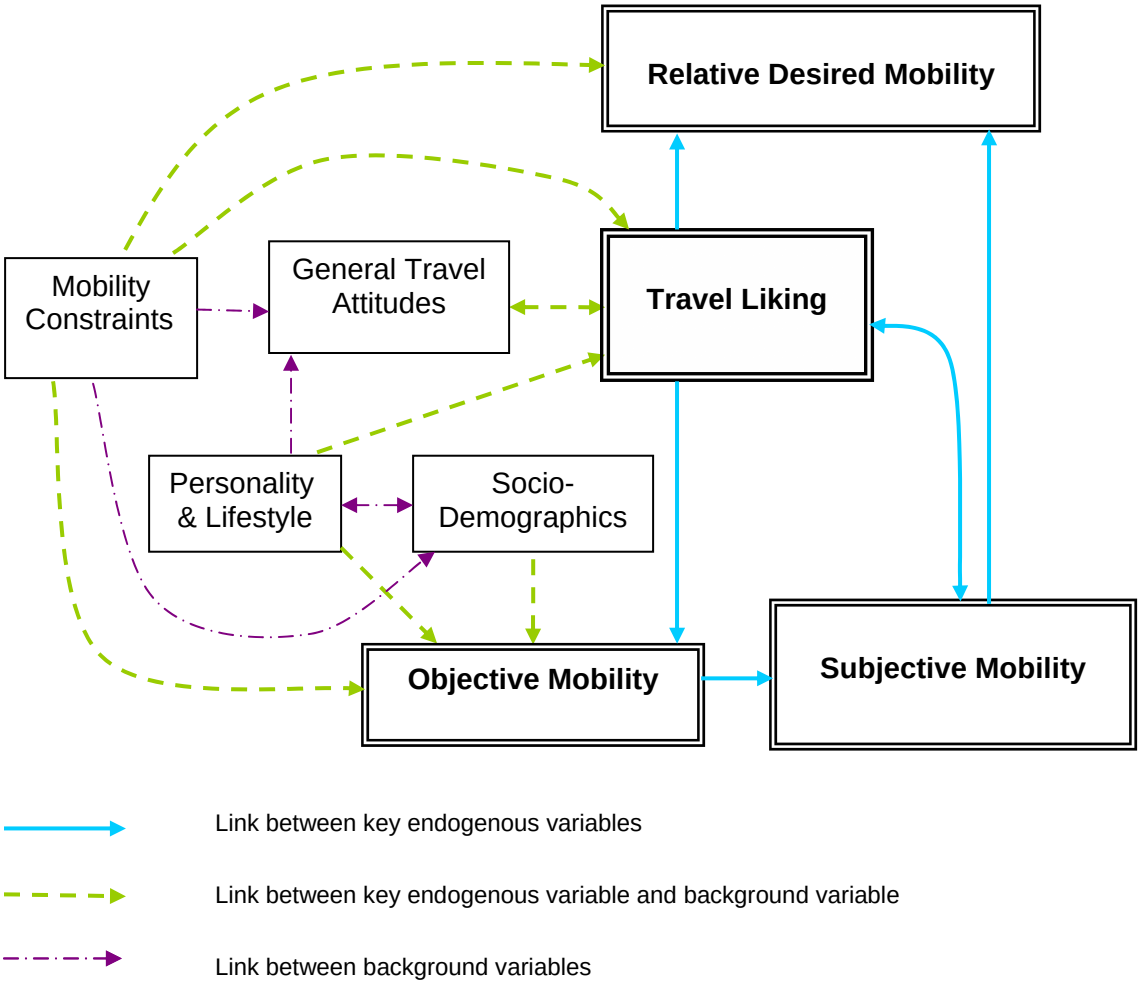

Figure 1.1: Conceptual Model of an Individual's Affinity for Travel

1.2 What are the Sources for a Liking of Travel?

Why would anyone like to travel? After all, conventional engineering and economic wisdom holds that the purpose of urban travel is purely to participate in spatially-separated activities. As

such, models of travel demand treat time spent in a car or aboard a transit vehicle strictly as a cost to be minimized – an assumption that ignores the possibility that any portion of urban travel could provide positive utility. However, the concept of liking travel for its own sake is not entirely foreign to the profession. For example, there is a sizable literature relating to the so-called "love affair with the automobile" (e.g., Wachs and Crawford, 1992; Marsh and Collett, 1986; Sachs, 1992), which, although perhaps stereotypically associated with Americans, is by no means unique to them, as attested by studies in Denmark (Jensen, 1999), the Netherlands (Steg, *et al.*, 2001), Scotland (Hiscock, *et al.*, 2002), and elsewhere, as well as by rising rates of auto ownership and vehicle-miles traveled throughout the world. Recent psychological studies have examined the relationship between the opposing desires for personal car use and pro-environmental behavior, which is increasingly associated with conforming to social norms (for recent examples, see Tertoolen, *et al.*, 1998; Nordlund and Garvill, 2003; Tanner, 1999). Beyond the obvious utilitarian benefits of the automobile (its often unmatchable convenience and comfort), these and other studies point out the psychological benefits of automobile use (e.g. it satisfies the need for self expression and helps demonstrate one's social position) and also state that driving a car is simply pleasurable (e.g. the sensation of movement and control) (Steg, *et al.*, 2001). The research presented here addresses automobile use as well, but more broadly investigates all types of travel, including purpose-specific travel, walking and the use of public transportation, and long-distance travel.

A number of transportation scholars have also commented in a general way on the intrinsic benefits of travel (see Mokhtarian, *et al.*, 2001 for citations). With those sources as background, Salomon and Mokhtarian (1998, pp. 136-137) suggest a number of reasons why travel (including, but not limited to automobile travel) might have a positive utility:

- "*adventure-seeking*: the quest for novel, exciting, or unusual experiences will in some cases involve travel as part or all of the experience itself, not just as a means to the end ('getting there is half the fun');
- *variety-seeking:* a more mundane version of the adventure seeking trait, the desire to vary from a monotonous routine may lead one, for example, to occasionally take a longer route to work or visit a more distant grocery store;
- *independence*: the ability to get around on one's own is one common manifestation of this trait;
- *control:* this trait is likely to partially explain travel by car when reasonable transit service is available;
- *status:* traveling a lot, traveling to interesting destinations, and traveling 'in style' (e.g. in a luxury car) can be symbols of a desired socio-economic class or lifestyle;

- *buffer:* … a certain amount of travel can provide a valued transition between activities such as home and work;
- *exposure to the environment:* 'cabin fever' is one manifestation of this desire, to leave an enclosed building and 'go somewhere', just to experience something of the outdoors;
- *scenery and other amenities:* may lead someone, for example, to take a longer route than necessary to a destination;
- *synergy:* the ability to conduct multiple activities at or on the way to a more distant destination, or the ability to be productive while traveling, may result in apparently excess travel."

To this list, we would add:

- *escape:* using travel to, for example, temporarily escape family obligations and/or domestic tensions;
- *curiosity:* certainly curiosity drives, to a certain extent, the adventure-seeking and variety-seeking mentioned above, but may not be limited to these two traits (see, e.g., Stagl, 1995); individuals may be curious about who may be taking the bus with them on a given day;
- *physical exercise:* although most naturally associated with non-motorized forms of travel such as walking, jogging, or bicycling, even the use of motorized modes requires a modicum of physical effort, beyond, e.g., sitting and watching television (walking to/from, getting into/out of the vehicle; see, e.g., Mackett, *et al*., 2004). A desire for exercise may lead one to engage in "undirected" (recreational) trips by non-motorized means, to choose a slower non-motorized mode over a faster motorized one, to park (or alight from transit) farther from the destination than necessary, or to make a trip when it could be foregone (e.g. substituted by telecommunications technology, as in telecommuting versus commuting); and, closely related,
- *the therapeutic value of movement/travel:* this dimension contains a number of aspects, including some already touched upon: the sensation of movement can have a soothing or (e.g., at high speeds) stimulative quality; fields such as yoga and dance therapy (Stanton-Jones, 1992) attest to both the physical and psychological benefits of movement; movement on a larger scale, i.e. travel, has been advised as mental therapy at least since Burton's (1621) *Anatomy of Melancholy* (see his Part II, Section II, Movement IV). The need to escape can also fall under this category when it represents a healthy response to stress, but we leave it separate since it can also constitute an unhealthy abdication of responsibility.

The exploration undertaken here attempts to identify which factors (if any at all) among those available to us most strongly explain the stated Travel Liking, as captured by our survey instrument. The report concludes with a comparison between the above hypothesized factors and the model estimation results.

1.3 Data

The data analyzed in this study are collected from a fourteen-page self-administered survey of approximately 2,000 individuals in the San Francisco Bay Area. A total of 8,000 surveys were mailed (leading to a response rate of about 25%) to randomly-selected households in three neighborhoods, namely: North San Francisco (half of the surveys), Concord (one-quarter) and Pleasant Hill (one-quarter). North San Francisco is an urban neighborhood, located close to the regional central business district (CBD) and well-served by transit. Concord and Pleasant Hill, in contrast, are both suburban cities, located across the San Francisco Bay from the regional CBD. This report focuses on a subset of the 2,000 respondents – those who work either part-time or full-time and commute at least once a month. This subset contains 1,358 respondents with relatively complete data on most variables of interest; some key Socio-Demographic characteristics of the sample are shown in Table 1.1. The decision to only consider commuters was based on the assumption (supported by a few tests) that relationships among Attitudes, Personality, and Mobility variables could be rather different for commuters than for non-commuters.

Table 1.1 indicates that our sample is relatively balanced in terms of gender and neighborhood location. The youngest and oldest age categories have few observations, but as the sample comprises full- and part-time workers, this is not surprising. Higher incomes are over-represented compared to the Census (see Curry, 2000 for further discussion). However, as the focus of the work is to model the impact of income and other variables on Travel Liking measures, rather than purely to ascertain the population distribution of such measures, it is more important simply to have a reasonable spread of incomes than that they be exactly representative (Babbie, 1998).

The organization of the rest of this report is as follows. The following section describes in more detail each of the variable categories considered in the modeling. Section 3 presents models of Travel Liking for different types of short- and long-distance travel. The final section summarizes the results and puts forth suggestions for further research.

Table 1.1: Socio-Demographic Characteristics of Sample (N=1,358)

Characteristic		Number (percent)
Concord		318 (23.4)
Pleasant Hill		369 (27.2)
North San Francisco		671 (49.4)
Female[a]		692 (51.1)
Have a driver's license[b]		1,338 (98.7)
Work full-time		1,141 (84.0)
Personal income[c]	< $15,000	31 (2.3)
	$15,000 – 34,999	141 (10.6)
	$35,000 – 54,999	269 (20.3)
	$55,000 – 74,999	250 (18.9)
	$75,000 – 94,999	220 (16.6)
	> $95,000	411 (31.1)
Age[d]	18 – 23	44 (3.2)
	24 – 40	584 (43.0)
	41 – 64	686 (50.5)
	> 65	43 (3.2)
Characteristic		**Mean (std. dev.)**
Total people in household		2.39 (1.22)
Total children under 18 in HH[e]		0.45 (0.84)
Total workers in HH (full/part-time)[f]		1.77 (0.80)
Number of personal vehicles in HH[g]		1.87 (1.08)
Total short distance travel (miles/week)[d]		219.46 (188.67)

[a] N=1,352; [b] N=1,356; [c] N=1,322; [d] N=1,357; [e] N=1,351; [f] N=1,354; [g] N=1,353

2. VARIABLES

2.1 The Dependent Variables: Travel Liking

The Travel Liking dependent variables were drawn directly from the survey via the question: "How do you feel about *traveling* in each of the following categories? We are *not* asking how you feel about the activity at the destination, but about the travel required to get there. Even if you seldom or never travel in a certain category, you may still have a feeling about it." Respondents then rated their liking for travel in various categories on a five-point ordinal scale anchored by "strongly dislike" and "strongly like". In addition to distinguishing Travel Liking by trip purpose and mode, these measures were further disaggregated into short-distance and long-distance. In keeping with the definition formerly used by the American Travel Survey, long-distance travel includes trips with a one-way distance of 100 miles or more. A summary of the

responses to the short-distance Travel Liking questions is presented in Table 2.1 and the long-distance responses are presented in Table 2.2

Turning first to the short-distance Travel Liking measures, the raw distributions in Table 2.1 certainly seem to support the contention that a subset of individuals has an affinity for travel. Even the stereotypically loathed daily commute is liked or strongly liked by more than a fifth of the sample (21.4 percent), with a similar proportion (18.6 percent) liking or strongly liking work/school-related travel. In fact, only three of the eight categories (those two plus bus) have a smaller share of "likers" (those in the strongly like and like categories) than "dislikers" (those in the strongly dislike and dislike categories).

Table 2.1: Short-Distance Travel Liking Dependent Variables (N=1,358)

Travel Liking Variable			Strongly dislike	Dislike	Neutral	Like	Strongly like
Overall		**N**	15	178	762	360	43
		%	1.1	13.1	56.1	26.5	3.2
Purpose	Commute	**N**	123	424	520	254	37
		%	9.1	31.2	38.3	18.7	2.7
	Work/School-Related	**N**	64	292	749	227	26
		%	4.7	21.5	55.2	16.7	1.9
	Entertain./Social/ Recreation	**N**	6	66	543	605	138
		%	0.4	4.9	40.0	44.6	10.2
Mode	Personal Vehicle	**N**	34	125	410	647	142
		%	2.5	9.2	30.2	47.6	10.5
	Bus	**N**	389	473	384	103	9
		%	28.6	34.8	28.3	7.6	0.7
	Rail	**N**	161	231	540	384	42
		%	11.9	17.0	39.8	28.3	3.1
	Walk/Jog/Bicycle	**N**	54	66	332	663	243
		%	4.0	4.9	24.4	48.8	17.9

Looking more closely at the purpose-specific categories, by far the most liked category of travel is entertainment/recreation/social – viewed favorably by more than half (54.8 percent) of the respondents. Of course, individuals liking leisure travel is not surprising; in addition to being influenced by the anticipated enjoyment at the destination, this type of travel often occurs with family or friends and is probably done with fewer time constraints (and less stress) than mandatory travel.

With respect to the mode-specific measures, surprisingly, travel by personal vehicle has an even higher share of "likers" (58.1 percent) than entertainment/recreation/social travel. In fact, among the short-distance categories, only travel by non-motorized modes (walking, jogging, and bicycling) is more beloved by survey respondents (66.7 percent). In line with stereotype, rail modes are viewed much more fondly than bus modes. Rail likers and dislikers each comprise about 30 percent of the sample, whereas bus dislikers outnumber likers nearly 8 to 1 (63.4 percent to 8.3 percent).

The responses to the long-distance Travel Liking questions are summarized in Table 2.2. Here, entertainment/recreation/social travel is enjoyed by a substantial majority of the sample (68.7%), as are overall (62.7%) and airplane travel (66.4%). Exactly half of the sample reports liking long-distance personal vehicle travel, though nearly a third (30.9%) feel neutral about it. The sizable amount of neutrality (42.4%) with respect to work/school-related long-distance travel may reflect both a balancing of pros and cons for this category and (for some) a relative lack of engagement in it.

Table 2.2: Long-Distance Travel Liking Dependent Variables (N=1,358)

Travel Liking Variable			Strongly dislike	Dislike	Neutral	Like	Strongly like
Overall		**N**	19	119	368	671	181
		%	1.4	8.8	27.7	49.4	13.3
Purpose	Work/School-Related	**N**	153	331	576	267	31
		%	11.3	24.4	42.4	19.7	2.3
	Entertain./Social/ Recreation	**N**	23	83	320	597	335
		%	1.7	6.1	23.6	44.0	24.7
Mode	Personal Vehicle	**N**	48	211	420	563	116
		%	3.5	15.5	30.9	41.5	8.5
	Airplane	**N**	54	130	272	632	270
		%	4.0	9.6	20.0	46.5	19.9

Since, for the most part, these responses vary in expected ways, a first reaction to the results may be that the respondents, even with the explicit survey instructions that emphasized consideration of the trip or travel rather than the activity at the end of the trip, confounded, to some degree, their liking for the activity with their liking for travel. As discussed in Mokhtarian and Salomon (2001), someone who reports a love for recreation travel may not be referring to the hours spent in the airport, on the airplane, and in a rental car. One may wonder how accurately the survey measured a liking for the actual travel.

In response to this justifiable concern, a number of considerations are relevant. We first discuss the potential for confusion between travel and the destination activities. Next, we present less obvious interactions between trip characteristics and travel, and explain how each may influence the Travel Liking results.

First, suppose that in the worst case the responses were *entirely* about the destination activity and not at all about the travel. They still have travel implications. Although the activities (work, entertainment, etc.) captured by these variables have in-home alternatives, it is well understood that those alternatives are often inferior to their out-of-home counterparts on a number of dimensions. To the extent that that is the case, the simple descriptive data shown in Table 2.1 and Table 2.2 point to a substantial level of current and potential demand for out-of-home activities and, as follows, the travel required to engage in out-of-home activities.

However, the argument that people confound destination activities with the travel required to reach them is most compelling for the five categories that relate to travel purposes: short-distance commute, work/school-related and entertainment/recreation/ social; long-distance work/school-related and entertainment/recreation/social. It is less persuasive (although not entirely baseless) to suggest that the six *mode-based* ratings of travel (short-distance personal vehicle, bus, rail, and non-motorized; long-distance personal vehicle and airplane), or the two *overall* ratings of travel (short- and long-distance, each placed first in their respective sections so that the respondent was reacting first to the "abstract concept" of travel rather than travel tied to a particular type of activity *or* mode), have the same problem. The fact that respondents could like "generic" travel is telling.

Further, the variation in the purpose-specific Travel Liking responses may indicate interactions between travel and *purpose*, independent of destination. For example, an individual traveling from Chicago to Miami for business may enjoy the trip itself less than another individual traveling on the same flight to visit family. The businessman may have anxiety over his performance at the destination; may be burdened by traveling with (and needing to work using) his laptop and cellular phone; or may feel stress due to pre-trip preparations. Without such preoccupations, the vacationer may be able to enjoy the in-flight movie or do some pleasure reading. Thus, two individuals traveling on the same flight may experience the travel differently due to their differences in trip purpose. In these types of interactions, the survey appropriately captures purpose-specific variation in the Liking for travel.

Interactions also exist between travel and the *route or destination*, rather than the activity at the destination *per se*. One may dislike congested travel, and local commute trips are often congested, so one expresses a dislike for commute travel. Or, an individual traveling to work via a bus route that overlooks the San Francisco Bay may express a liking for commute travel, when the motivation for the liking is really the scenic beauty. In either case, individuals are again responding to differences in the travel itself, that happen to be associated with certain trip purposes more than others. This is consistent with the findings of Anable and Gatersleben (2004), that both car and public transport trips were viewed with more positive emotion when they were undertaken for leisure purposes than for commuting purposes.

The latter two types of interactions constitute legitimate variations in the *quality of the travel experience* (leading to legitimate variations in the Travel Liking measure); only the first form of response (complete mental "substitution" of the travel for the activity, and responding to the activity *instead of* the travel) constitutes the spurious confounding that we are concerned about.

Of course, the conceptual considerations presented in the Introduction and at greater length in the references cited there provide a number of reasons why travel itself could have positive utility. Thus, the concept is not *prima facie* untenable; the question is not whether people can possibly like travel for its own sake, but only the degree to which they do. Overall then, we believe that, although imperfect, these responses are telling us something valid about the Liking for travel itself. Nevertheless, as we discuss further in the Summary and Discussion section, it is important to refine these measures in future work.

2.2 The Potential Explanatory Variables

The potential explanatory variables used in the models can be placed into nine general categories, namely: Objective Mobility, Subjective Mobility, Relative Desired Mobility, Attitudes, Personality, Lifestyle, Excess Travel, Mobility Constraints, and Socio-Demographics. Each category is described very generally in this section. Variables included in the models will be given more discussion in Section 3 and descriptive statistics (for only those variables that are significant in at least one of the models) are included in the Appendix.

The survey questions capturing Objective Mobility, Subjective Mobility, and Relative Desired Mobility had structures similar to those for Travel Liking. In each section, the measures were obtained for overall travel, travel segmented by purpose, and travel segmented by mode for both short- and long-distance (greater than 100 miles one way) trips. The short-distance trip

purposes selected for inclusion in the survey are as follows: commute, work/school-related, grocery shopping, to eat a meal, for entertainment/ recreation/social activities, and chauffeuring (taking others where they need to go). The short-distance travel modes are the following: personal vehicle, bus, commuter train/heavy rail/light rail, and walking/jogging/bicycling. The long-distance trip purposes are work/school-related and entertainment/recreation/social activities; the modes are personal vehicle and airplane.

Objective Mobility

These questions asked about distance and frequency of travel by mode and trip purpose, as well as travel time for the commute trip. For short-distance trips, respondents were asked how often they traveled for each purpose, with six categorical responses ranging from “never” to “5 or more times a week”. Respondents were also asked to specify how many miles they traveled each week, in total and by mode and purpose.

The long-distance Objective Mobility variables come from a section of the survey in which respondents were asked how often they traveled to various parts of the globe “last year”, by purpose (for entertainment and work/school-related activities) and mode (personal vehicle, airplane and other) combinations, with an “other” category to catch any remaining travel. These responses indicated number of trips directly, and were also converted into approximate distances by measuring from a central position in the Bay Area to a central location within the destination region.

Trips were combined across world regions to obtain three different measures of distance:

- Total miles, the simple sum of the estimated miles for each reported trip;
- Log of miles, the natural logarithm of one plus the total number of miles. One mile was added to each total so that when zero miles were actually traveled in a given category, the log transformation would return the value zero (= ln(1)) rather than $-\infty$ (= ln(0));
- Sum of the log-miles, obtained by taking the natural logarithm of one plus the number of miles of each trip in the category *separately*, and summing across all trips in the category.

The log transformations represent a hypothesized diminishing marginal influence of trip length on another variable of interest. The third measure listed above differs from the second by incorporating the number of trips as well as total distance traveled into the measure (the same number of total miles will have a larger sum of log-miles value if it is divided among several trips than if it constitutes only a single trip).

Discriminating each of these variables by travel mode (personal vehicle, airplane, and other means), plus retaining the original "total" variables, yielded a set of 12 measures of distance that were used in the models.

Subjective Mobility

Here we ask respondents for a subjective assessment of their travel. Again segmenting travel by mode, trip purpose, and trip length (short and long), respondents rated their amount of travel on a five-point semantic-differential scale anchored by "none" and "a lot".

Relative Desired Mobility

These questions focused on how much travel individuals wish to undertake, compared to their current levels. Again, a five-point scale, here anchored by "much less" and "much more", was used, and travel was segmented in a manner similar to Objective Mobility, Subjective Mobility, and Travel Liking.

Attitudes

Attitudes towards travel, land use, and the environment were captured using responses on a five-point Likert-type scale, to 32 statements. Through factor analysis (see Redmond, 2000 or Mokhtarian, *et al.*, 2001 for details of the factor analyses on these as well as the Personality and Lifestyle variables), the statements were distilled into six basic dimensions, namely: travel dislike, pro-environmental solutions, commute benefit, travel freedom, travel stress, and pro-high density. Table 2.3 presents a pattern matrix indicating the strength of the association of each of the survey statements with each of the Attitude factors. The closer in magnitude a pattern matrix loading is to 1.0, the more strongly a given statement is associated with the corresponding factor. A score for each individual on each factor can be computed from these

Table 2.3: Pattern Matrix for Attitude Factors (commuters only, N=1,427)

Variable	Factor label					
	Travel dislike	**Pro-environment**	**Commute benefit**	**Travel freedom**	**Pro-high density**	**Travel stress**
Traveling is boring.	0.621					
I like exploring new places.	-0.537					
The only good thing about traveling is arriving at your destination.	0.525					
Getting there is half the fun.	-0.465					
To improve air quality, I am willing to pay a little more to use an electric or other clean-fuel vehicle.		0.641				
We should raise the price of gasoline to reduce congestion and air pollution.		0.617				
We need more public transportation, even if taxes have to pay for a lot of the costs.		0.612				
We can find cost-effective technological solutions to the problem of air pollution.		0.353				
I limit my auto travel to help improve congestion and air quality.		0.372				
We need more highways, even if taxes have to pay for a lot of the costs.		-0.194				
My commute is a real hassle.			-0.695			
My commute trip is a useful transition between home and work.			0.583			
The traveling that I need to do interferes with doing other things I like.			-0.530			
I use my commute time productively.			0.467			
Travel time is generally wasted time.	0.379		-0.461			
Getting stuck in traffic doesn't bother me too much.			0.419			
In terms of local travel – I have the freedom to go anywhere I want to.				0.511		
In terms of long-distance travel – I have the freedom to go anywhere I want to .				0.422		
The vehicles I travel in are comfortable.				0.295		

Variable	Factor label					
	Travel dislike	**Pro-environment**	**Commute benefit**	**Travel freedom**	**Pro-high density**	**Travel stress**
It is nice to be able to do errands on the way to and from work.				0.269		
I am willing to pay a toll to travel on an uncongested road.				0.212		
Living in a multiple family unit wouldn't give me enough privacy.					-0.617	
I like living in a neighborhood where there is a lot going on.					0.486	
Having shops and services within walking distance of my home is important to me.		0.243			0.401	
I like having a large yard at my home.					-0.323	
I worry about my safety when I travel.						0.544
Traveling makes me nervous.	0.201					0.537
Traveling is generally tiring for me.	0.266	-0.225				0.410
I'd rather have someone else do the driving.					0.227	0.329
I tend to get sick when traveling.						0.318
I am uncomfortable being around people I don't know when I travel.						0.297
I like traveling alone.						-0.194

Source: Redmond (2000). Note: For ease of interpretation, only loadings higher than about 0.200 in magnitude are shown.

loadings; it is those factor scores that were included as potential explanatory variables in the models.

Personality

Respondents rated 17 attributes on a five-point scale (anchored by “hardly at all” to “almost completely”) in terms of how well the attributes described them. Here, the factor analysis revealed four personality types: adventure-seeker, organizer, loner, and the calm personality. Three of these personality types proved significant in the Travel Liking models – calm, adventure-seeker, and organizer. The pattern matrix is presented in Table 2.4.

Lifestyle

The survey contained 18 statements related to work, family, money, status, and the value of time. Respondents agreed or disagreed with the statements using a five-point Likert-type scale. Four lifestyle factors emerged: status seeker, workaholic, family/community related, and a frustrated factor. Each of these factors is significant in at least one of the Travel Liking models; the associated pattern matrix is presented in Table 2.5.

Excess Travel

To qualitatively measure excess travel, participants indicated how often (on a three-point scale: “never/seldom”, “sometimes”, “often”) they engaged in each of 13 activities involving seemingly unnecessary travel. Questions included, “how often do you travel…”: “with no destination in mind?”, “just for the fun of it?”, and “mainly to be alone?”

Mobility Constraints

Here, participants selected, on a three point scale (“No limitation”, “Limits how often or how long”, “Absolutely prevents”), the degree to which physical conditions or anxieties prevented them from engaging in a variety of travel forms, including: “driving on the freeway”, “driving at night”, and “flying in an airplane”. The percentage of time an automobile is available to the participant is also considered to be a Mobility Constraint (oriented in the reverse direction).

Table 2.4: Pattern Matrix for Personality Factors (N=1,904)

Variable	Factor label			
	Adventure seeking	**Organizer**	**Loner**	**Calm**
Adventurous	0.776			
Variety seeking	0.685			
Spontaneous	0.574			
Risk taking	0.557			-0.192
Like to stay close to home	-0.435	0.168		
Ambitious	0.422	0.330		-0.217
Like moving at high speeds	0.398			-0.345
Like being outdoors	0.385			
Efficient		0.624		
On time		0.371		
Like a routine	-0.355	0.364		
Like being alone			0.935	
Like being independent	0.250	0.301	0.314	
Aggressive	0.162	0.312		-0.599
Patient	0.163			0.532
Restless				-0.389
Like being in charge	0.199	0.363		-0.380

Source: Redmond (2000)

Table 2.5: Pattern Matrix for Lifestyle Factors (N=1,904)

Variable	Factor label			
	Frustrated	Family / community oriented	Status seeking	Workaholic
I often feel I don't have much control over my life.	0.720			
I am generally satisfied with my life.	-0.618			
Work and family do not leave me enough time for myself.	0.357	0.262		0.203
I wouldn't necessarily have to like my work that much, as long as I made enough money.	0.214	-0.037		
I feel that I am wasting time when I have to wait.	0.160			0.156
I'd like to spend more time with my family and friends.		0.585		
My family and friends are more important to me than my work.		0.472		-0.233
I'd like to spend more time on social, environmental, or religious causes.		0.418		
Occasionally, I'd be willing to give up a day's pay to get a day off work.		0.273		
To me, the car is a status symbol.			0.698	
A lot of the fun of having something nice is showing it off.			0.518	
To me, the car is nothing more than a convenient way to get around.			-0.411	
The one who dies with the most toys win.			0.410	
I'm pretty much a workaholic.				0.652
I'd like to spend more time on work.		-0.164		0.373
I generally try to spend some time each week just on myself.				-0.178
I don't like to stay in one place for long.				0.171

Source: Redmond (2000)

Socio-Demographics

The survey captured an extensive amount of typical Socio-Demographic data to allow for comparison of our sample with more general populations. The data included measures of age, income, household size, employment type, number of household workers, education level, gender, and make/model of the vehicle driven most often by the respondent. The latter variable was allocated to one of nine major vehicle categories: small, compact, mid-sized, large, luxury, sport utility vehicle, minivan/van, pick-up truck, and sports (for more details, see Curry, 2000).

3. MODELS

3.1 General Specification Issues

A total of 13 linear regression models are developed from the Travel Liking survey responses – eight models for short-distance travel, specifically: overall, work/school commute, work/school-related, entertainment/recreation/social, personal vehicle, bus, rail, and non-motorized (walk, jog, and bicycle); and five models for long-distance travel: overall, work/school-related, entertainment/recreation/social, personal vehicle, and airplane. The ordinal Travel Liking dependent variables are treated as continuous in this application and the sample includes only working commuters (those who work full- or part-time and commute at least once a month). Though an ordered probit model would be more theoretically appropriate in this context, the number of models estimated along with the number of potential explanatory variables made the use of regression, primarily due to the availability of higher quality commercial software packages (with automated stepwise specification capabilities), the preferred approach (for an ordered probit version of the commute Travel Liking model, please see Ory, *et al.*, 2004).

Due to the variety of variables in the data set, certain *a priori* decisions as to which variables could reasonably be expected to influence a Liking for travel had to be made. The variables in the Relative Desired Mobility category were completely excluded from consideration: we assume that wanting to travel more than currently is an effect rather than a cause of Travel Liking. Further, it was assumed that travel itself could cause an individual to *dislike* travel, that is that Subjective or Objective Mobility could have a negative impact on Travel Liking, but we excluded such variables when they appeared with a positive coefficient. Although it is possible

that greater Mobility in a certain category could lead to greater Travel Liking (riding the bus a lot could generate a fondness for the bus), we consider it more likely that a positive relationship is indicative of the opposite direction of causality – that is, that higher Travel Liking leads to higher mobility. Thus, we excluded Mobility variables that initially appeared in the Travel Liking models with positive signs.

We hypothesize that Travel Liking will be most heavily influenced by the various Personality, Lifestyle and Attitude variables included in the data set. We believe Travel Liking to be an intrinsic human characteristic, which is shaped by one's experiences, and most readily revealed by the attitudes individuals hold toward travel-related issues. Travel demand researchers have demonstrated the powerful impacts of attitudes on traveler decisions for more than two decades (e.g. Dobson *et al.*, 1978; Dumas and Dobson, 1979; Tischer and Phillips, 1979; Kitamura *et al.*, 1997). The modeling of Travel Liking, already demonstrated to be an important determinant of objective, perceived and desired travel in the single-equation models of Objective Mobility (Mokhtarian, *et al.*, 2001), Subjective Mobility (Collantes and Mokhtarian, 2002) and Relative Desired Mobility (Choo *et al.*, forthcoming), allows for a more complete picture of how these attitudes impact travel.

While the data used to estimate the Travel Liking models included myriad Attitude, Personality, and Lifestyle variables, these variables do not perfectly capture the relevant intrinsic characteristics of all individuals. For this reason, a handful of variables included in the models are intended to represent human characteristics not otherwise captured, as illustrated in Figure 3.1. For example, certain models include the Excess Travel variable "How often do you travel … to explore new places." This question probably better captures a sense of curiosity than any of the other variables in the data set. As such, it serves as a proxy for the influence of curiosity on Travel Liking – a very plausible relationship.

It should be noted that certain Excess Travel measures, specifically "How often do you travel …just for the fun of it", and "…to a more distant destination than necessary, partly for the fun of traveling there", were not considered as potential explanatory variables. Due to the use of the word "fun", it seems more likely that those who enjoy traveling will engage in this type of Excess Travel. Again referring to Figure 3.1, it seems the underlying human characteristic these variables are representing is, in fact, Travel Liking, and that including them in the models would therefore be conceptually tautological.

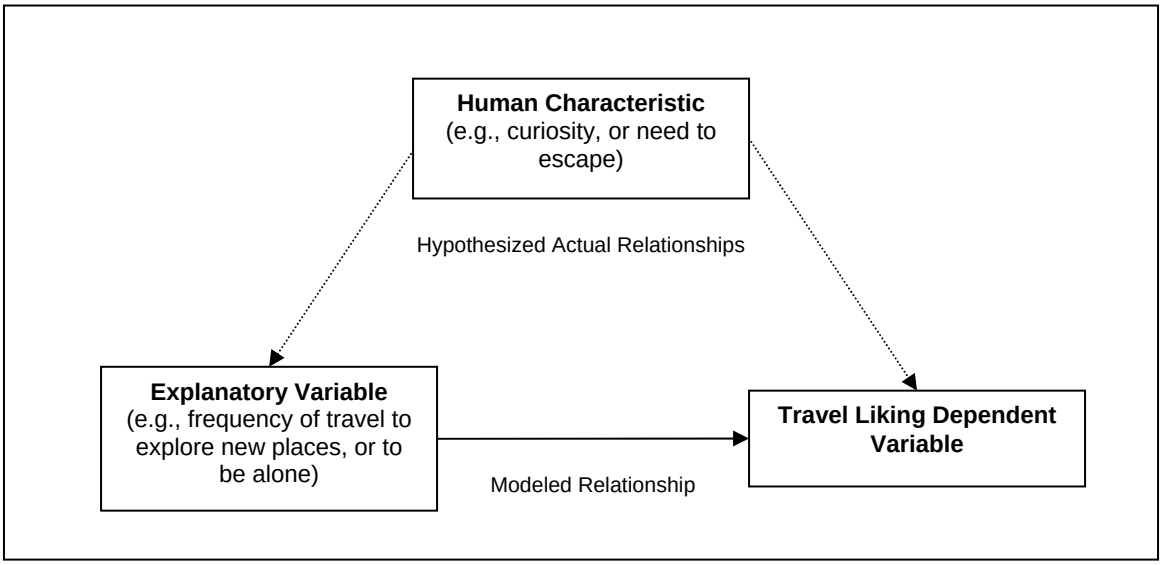

Figure 3.1: Hypothesized Relationship between Certain Explanatory Variables and Dependent Variables

In the following sections, each of the models is presented and discussed in detail – first the short-distance models and then the long-distance models. As many of the models have estimated coefficients with the same sign for the same variable, to streamline the presentation a section discussing variables common to several models precedes the detailed discussion of the individual models.

3.2 Discussion of Variables Appearing in Multiple Short-Distance Models

A summary of all the short-distance models is presented in Table 3.1. The adjusted R^2 values for these models range from 0.118 (for entertainment/recreation/social) to 0.346 (for commuting), which are typical-to-high for disaggregate models of travel behavior.

The first interesting result is the expected negative influence of amounts of travel on the Liking for travel. Those who commute long distances or durations tend to enjoy travel less than those with shorter commutes. As commute travel constitutes a large portion of total travel, the weekly commute distance variable, as expected, also influences overall Travel Liking. These results fit the conventional stereotype of travel as a cost and, for those with large travel amounts, these costs manifest themselves in stated negative feelings toward travel.

Next, we examine those variables that are common to the models of Liking for bus and rail (commuter rail, light rail, and BART – the Bay Area's Rapid Transit regional rail system) travel. Both of these models contain the one-way commute distance measure, which indicates that, in the San Francisco Bay Area, those with longer commutes are more likely to enjoy transit modes than those with shorter commutes. It may be that those who spend a substantial amount of time on transit vehicles are less troubled by initially waiting for the arrival of the vehicle, or may enjoy avoiding the potentially longer automobile commute, or may simply have more time on the vehicle to read and/or relax. Further, the Bay Area has many commuter buses, similar to tour or Greyhound buses, that offer more comfort than typical city buses for longer trips. Those who have long commutes but are not able to take transit may be reflecting an expectation that their commute would be more enjoyable if only they didn't have to drive in congestion.

Other variables significant in the models of Liking for bus and rail travel are Mobility Limitations on taking public transit and riding bicycles. Those who are unable to use or are limited in taking public transit, not surprisingly, have a lower Liking for the modes in question than those with no physical or psychological limitations. Similarly, those who have difficulty riding or are unable to ride a bicycle have a higher tendency to enjoy transit (this can generally be extended to those who have difficulty with non-motorized modes, as there is a strong correlation – coefficient of 0.503 – between limitations on bicycle use and on walking). This may indicate not only a greater familiarity with transit on the part of those for whom bike is not an option, but perhaps also that the unattractiveness of non-motorized modes for these individuals produces a compensating affection for the alternative modes that are available.

Another variable included in the Liking for bus and rail travel is the organizer Personality factor score, with a negative coefficient. This is logical since (based on the variables in our survey that loaded heavily on this factor, as shown in Table 2.4) organizers are those who like to be efficient, in charge and on time – traits not traditionally associated with riding transit in the United States.

One of the most significant variables in many of the models is the commute benefit Attitude factor score. This variable appears in all but two (entertainment/recreation/ social and walk) of the short-distance Travel Liking models and is often (based on the beta coefficient) among the most powerful variables. This result suggests that those who view their commute time as productive and do not find it to be very stressful (whether because the commute is, in fact, objectively *not* stressful, or because their personality is on the calm side, or because they

actively adopt coping mechanisms to improve their productivity and reduce the stress of the commute) have a higher Liking for different types of travel (by extension, it could be inferred that these individuals find not only the commute time, but other kinds of travel time to be productive).

The travel freedom Attitude factor score entered into four of the models. Those who feel as though they have the ability to go wherever they choose, whenever they choose, tend to like various types of travel more than those who have less travel freedom. This result is important in that it reinforces the joy individuals find in mobility and the potential for mobility. Although the travel freedom factor is not mode-specific, the Attitude it represents is certainly one reason for the nearly-universal popular appeal of automobiles (as discussed in the Introduction).

Perhaps the most expected result is the common negative sign on the coefficient for the travel dislike Attitude factor score variable, which appears in four of the eight short-distance models. Though measured independently (see Table 2.3), it is certainly expected that, for example, those who agree that “traveling is boring” would also dislike certain types of travel. It is surprising that the travel dislike variable does not enter more of the models, and is, in fact, often of less significance than other Attitude, Personality, and Lifestyle measures. For example, in the model of overall Travel Liking, the travel freedom and commute benefit factor scores also enter into the model (with the expected positive signs) and both have more explanatory power (from the beta coefficients) than the travel dislike factor score. This result indicates that a general distaste for travel is not as powerful a determinant of overall short-distance Travel Liking as finding the commute to be a productive time (commute benefit) or, to a lesser extent, enjoying the freedom travel provides (travel freedom). As we will see in Sections 3.11 to 3.16, this variable is substantially more influential with respect to long-distance travel.

Also entering four of the models is the status seeker Lifestyle factor score. Daily travel may be the best opportunity for these individuals to proudly display a key symbol of conspicuous consumption – a nice automobile. This result is consistent with other studies that have found that the desire to display one’s status, or social standing, influences car use (see, e.g. Steg, *et al.*, 2001; Steg, 2004), as it does here, operating through the Travel Liking variable.

Entering both the rail and walk/jog/bicycle mode-specific models is the educational background variable. Both fit the stereotype of the affluent, well-educated commuter well-served by rail and favoring it over bus, and using non-motorized travel as a means of exercise. Also fitting with stereotype (and the literature referenced in the Introduction) is the positive coefficient on the

pro-environmental solutions and pro-high density Attitude variables entering the bus, rail, and non-motorized Travel Liking models, along with the reverse sign on the same variables' coefficients in the personal vehicle model.

The calm Personality factor variable also enters multiple models – Liking for work/school-related, entertainment/recreation/social, and bus travel. Individuals with high scores on this trait may be more relaxed when they encounter the inevitable stresses of travel, and hence more inclined to enjoy it.

Finally, a variety of variables in the Excess Travel category enter into many models. Those who often travel "mainly to be alone", and also those having children under 15 years old, tend to enjoy commuting and work-related travel. These results support the notion, as mentioned in the Introduction of this paper, that travel offers an opportunity to be alone – to temporarily escape the stresses of family or work obligations (Edmonson, 1998; Zitnik, 2004).

Those who engage in Excess Travel "to explore new places", following intuition, like to travel for entertainment/recreation/social purposes and also enjoy non-motorized modes – both types of travel are typically associated with exploration. Interestingly, the Excess Travel variable "by a longer route to experience more of your surroundings" appears in both the walk/jog/bicycle model and the personal vehicle model. Although the experience may be more participatory and up-close for walking, and more observational and arms-length for the personal vehicle mode, the desire for more information about one's environment may be similar in both cases (see, e.g., Arentze and Timmermans, 2004).

Table 3.1: Summary of Short-Distance Travel Liking Models

Explanatory variables		Dependent variable (adjusted R-squared): Travel Liking for…							
Category	**Variable**	Overall (0.214) N=1321	Cmt. (0.346) N=1339	Work/ Sch-rel (0.143) N=1351	Ent/Rec (0.118) N=1327	Pers veh (0.182) N=1344	Bus (0.170) N=1319	Rail (0.182) N=1295	Walk, etc. (0.196) N=1299
Objective Mobility	Weekly commuting distance (miles) [0,800]	-	-						
	Weekly total SD travel (miles) [5,1500]					-			
	Commute mode dummy – bus or ferry [0,1]		-						
	Commute mode dummy – rail [0,1]				+				
	One-way commute time (minutes) [2,130]		-						
	One-way commute distance (miles) [0,…,108]						+	+	
	Weekly travel by other means (miles) [0,600]			-					
	Past year (log) total long distance miles [0,12.8]*					-			
Subj. Mob.	Overall short distance travel [1,…,5]		-						
Attitude	Travel dislike factor score [-1.8,3.7]	-			-	-			-
	Travel stress factor score [-1.9,2.9]				-				
	Commute benefit factor score [-2.9,2.6]	+	+	+		+	+	+	
	Travel freedom factor score [-3.0,2.3]	+	+	+		+			
	Pro-environ. solutions factor score [-2.3,2.4]					-	+	+	+
	Pro-high density factor score [-2.5,2.3]				-	-	+	+	
Lifestyle	Family/com-related factor score [-3.9,2.1]		-	-	+			+	+
	Status seeker factor score [-1.7,2.7]	+		+	+	+			
	Workaholic factor score [-2.1,2.7]						+		
	Frustrated factor score [-2.0,2.7]				-				
Personality	Organizer factor score [-2.9,2.6]						-	-	
	Calm factor score [-2.9,2.4]			+	+		+		
Excess Travel [1,2,3]	How often do you travel … just to relax	+							
	… to clear your head								+
	… to explore new places				+				+
	… when you need time to think				+				
	… by a longer route to exp. more of your srndgs.					+			+
	... mainly to be alone		+	+					
Mobility Limit. [1,2,3]	Conditions which prevent or limit air travel							+	
	Conditions which prevent or limit public transit						-	-	
	Conditions which prevent or limit bicycle						+	+	
Socio-demo-graphic	Luxury vehicle type dummy [0,1]							-	
	Minivan vehicle type dummy [0,1]								-
	Suburban dummy [0,1]	+							
	Concord dummy [0,1]								-
	Sales occupation dummy [0,1]							+	
	Professional occupation dummy [0,1]	-							
	Personal income category [1,…,6]	-			-		-		
	Number of persons age 6-15 in HH [0,…,3]			+					
	Number of persons age 24-40 in HH [0,…,7]		-						+
	Number of persons age 41-64 in HH [0,…,3]	+							
	Number of persons age 65-74 in HH [0,1,2]								-
	Number of persons in HH [1,…,8]		+				+		
	Single adult with children family status dmy [0,1]								+
	Female [0,1]					+		-	
	Educational background [1,…,6]							+	+

Notes: [ ] represents variable range; HH = household; SD = short distance; * Logarithm (miles +1) to avoid taking the log of zero

3.3 Overall Short-Distance Travel

This section discusses the model of Travel Liking for all short-distance travel (by all modes, for all trip purposes). As a majority of the short-distance travel for commuters in our sample is commuting to and from work or school (Figure 3.2[1] averages the individual purpose shares, by mileage, across the sample; Figure 3.3[2] shows the average individual mode shares, by mileage, across the sample), it is expected that this model will be highly similar to the model of commute travel presented in Section 3.4.

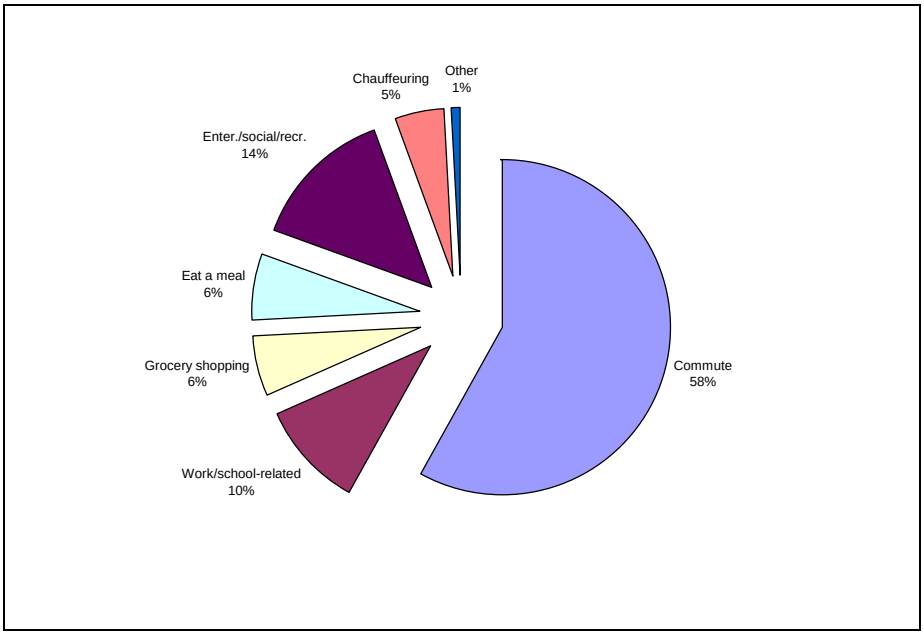

Figure 3.2: Average Shares of Mileage by Purpose

[1] Respondents reported miles traveled in each category "in a typical week". The "other" category was not explicitly provided, but distance traveled in that category is taken to be the difference between the total distance traveled in a typical week (explicitly obtained) and the sum of distances in each of the other categories. As such, these measures are only approximations, and probably not comparable to shares obtained from a more rigorous diary-based measurement instrument. For example, shares for the provided purposes are probably overestimated and for "other" purposes probably underestimated. MTC (2001a) estimates the following shares of mileage by purpose: home-based work, 41.2%; home-based school, 5.3%; home-based social/recreation, 10.8%; home-based shop/other, 20.1%; non-home-based, 22.6%.

[2] For modes, respondents were provided all five categories (including "other"), and asked to ensure that distance traveled by each mode summed to their total distance traveled "in a typical week". Thus, we expect these responses to be somewhat less biased than the purpose-specific ones, but still dependent on respondents' abilities to accurately estimate distances by each mode and aggregate across multiple trips in a week. MTC (2001b) estimates the following shares of *trips* (not mileage) as follows: personal vehicle, 83.9%; transit, 5.6%; non-motorized, 10.5%.

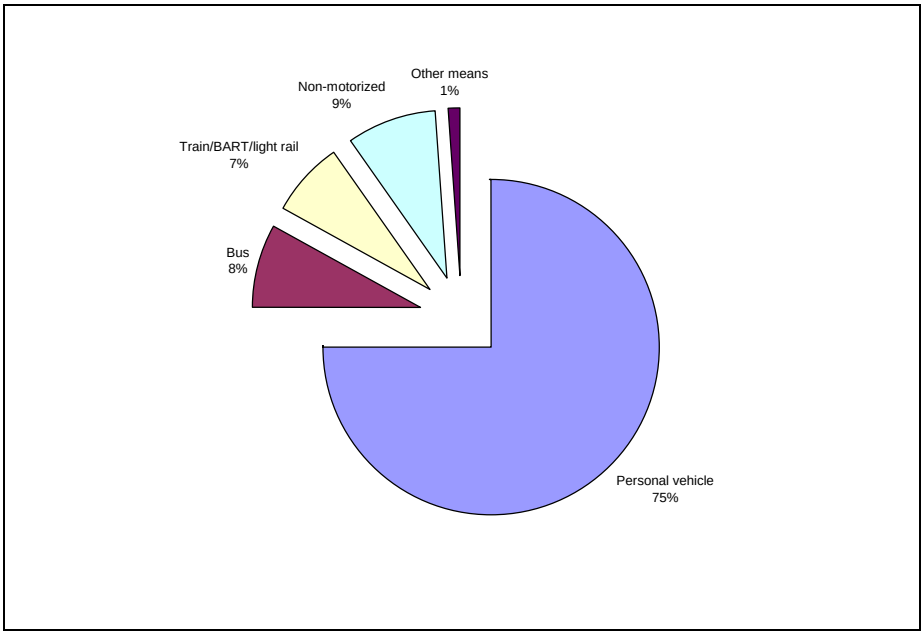

Figure 3.3: Average Shares of Mileage by Travel Mode

Our *a priori* expectations entering into the modeling are that, consistent with our primary hypothesis, measures of Attitudes, Personality, and Lifestyle will be the dominant explanatory variables. However, due to the influence of commute travel on overall travel, it is expected that certain Objective Mobility measures will negatively impact Travel Liking. Specifically, it is expected that those with long commutes will enjoy this type of travel less, all else equal, than those with shorter commutes.

Table 3.2 summarizes the overall short-distance Travel Liking model estimation results. As expected, those who are forced (viewing commute travel as mandatory, in the typical tripartite segmentation of mandatory, maintenance and discretionary travel) to commute long distances are less likely to enjoy traveling overall. This result is shown through the negative coefficient on the weekly miles commuting Objective Mobility variable.

In addition to the Objective Mobility measure, a variety of Socio-Demographic measures, for which we had no strong expectations, also enter into the model. Those with higher incomes enjoy traveling less, as do those in professional occupations. It is plausible in both cases that this relative dislike reflects a higher value of time (i.e. a greater opportunity cost for, and hence greater resentment of, time spent traveling). Given that higher incomes are generally associated with more travel in this sample as elsewhere (see e.g., Ory, *et al*, 2004), this result may also

partly represent a further Objective Mobility effect. Those living outside of San Francisco in the Pleasant Hill and Concord neighborhoods (both considered “suburbs”) enjoy short-distance travel more, on average, than those living in San Francisco. Such a result could certainly be attributed to the greater ease of automobile usage and faster speeds present in the suburbs. There could also be an endogeneity effect, in that those who like traveling less may be more inclined to choose a central urban residential location that will reduce the need to travel. As the number of individuals 41 to 64 in the household increases, the Travel Liking also increases. Taking this variable to be relatively representative of the respondent’s age, it is likely that individuals in this age category have less pressing needs at home (such as young children) and, over time, have been able to either adopt a more preferential commute, or adapt to the one they have.

In addition to the Objective Mobility and Socio-Demographic measures, impacts on Travel Liking are found among the Attitude, Lifestyle and Excess Travel measures. In fact, the Attitude and Lifestyle variables (commute benefit, travel freedom, travel dislike, and status seeker) are the most powerful explanatory variables in the model, as shown by their beta (standardized coefficient) values, which supports our primary hypothesis (see Section 3.2 for further discussion of these variables).

The Excess Travel variable “how often do you travel … just to relax” also enters the model with a positive sign. This measure is probably capturing the relaxing sensation many individuals obtain from the movement or sense of control found in traveling, representing one reason individuals may have a positive utility (and hence a Liking) for travel. As shown in Figure 3.1, this variable may be serving as a proxy for this difficult-to-define human characteristic.

3.4 Commute to Work/School

As alluded to in the previous section, the model here considers Liking specifically for commute (to work or school) travel (this model is also discussed in Ory *et al.*, 2004). Expectations for this model mirror those discussed previously for overall short-distance travel – certain measures of Objective Mobility will enter the model along with the dominant Attitude, Lifestyle, and Personality measures.

Table 3.2: Model of Liking for All Short-Distance Travel (N=1,321)

Dependent Variable : Overall liking for short-distance travel [1, …, 5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	3.278	41.42	
Objective Mobility			
Weekly commute miles [0,800]	-0.000536	-3.69	-0.100
Socio-Demographics			
Suburban dummy [0,1]	0.122	3.11	0.0833
Personal income category [1,…,6]	-0.0427	-3.11	-0.0838
Professional occupation dummy [0,1]	-0.0664	-2.26	-0.0562
Number of persons age 41-64 in household [0,…,3]	0.0450	1.99	0.0516
Attitudes			
Commute benefit factor score [-2.9,2.6]	0.235	9.89	0.278
Travel freedom factor score [-3.0,2.3]	0.108	4.12	0.109
Travel dislike factor score [-1.8,3.7]	-0.0904	-3.64	-0.106
Lifestyle			
Status seeker factor score [-1.7,2.7]	0.0918	4.13	0.102
Excess Travel [1,2,3]			
How often do you travel … just to relax	0.0984	3.15	0.0813

[ ] = range of possible or observed responses

Adjusted R^2 = 0.214 (R^2 = 0.220) F-statistic = 36.87 (p = 0.000)

The results of the commute Travel Liking model estimation are presented in Table 3.3. The adjusted R^2 for this model is 0.346, the highest among the short-distance models of Travel Liking. While some of the significant variables are similar to those presented in the previous section, important differences do emerge. Examining first the measures of Objective Mobility, a more detailed decomposition of the effects of actual commute travel emerges. Rather than simply the weekly commute distance (which was the lone Objective Mobility measure in the overall short-distance Travel Liking model), here multiple commute descriptors are significant, including weekly commute distance, commute time, and primary commute mode[3]. Those with

[3] To ease the burden on the respondent, we collected data on the distance traveled for each specific mode and purpose separately, rather than for each mode-purpose combination. The primary commute mode variable was derived from a set of rules based on those reported travel distances. By comparing reported weekly miles traveled by each mode to the fraction of weekly miles traveled for commuting, one of five modes (personal vehicle/motorcycle, bus/ferry, train/BART/light rail, walking/jogging/bicycling, and other) was assigned to each individual as a primary commute mode. The assignment was made with 100% confidence for 13.5% (single-mode users) of the sample of 1,358 commuting workers, with a high degree of confidence for an additional 55.6% (those whose miles of travel by a single mode exceeded

long commutes, both in terms of distance and time, are more likely to disdain travel, as are those who commute primarily by bus or ferry – perhaps not their desired mode. Further, how much short-distance travel individuals perceive themselves to be engaged in overall, operating through the Subjective Mobility measure, is also (negatively) important to Travel Liking. This result follows intuition: individuals who feel as though they are always traveling may be less able to enjoy their commute than those who travel little beyond the commute, and who, as a result, may relish such travel.

Table 3.3: Model of Liking for Work/School Commute Travel (N=1,338)

Dependent Variable : Liking for work/school commute travel [1, …, 5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	2.936	28.50	
Objective Mobility			
Weekly commute miles [0,800]	-0.000786	-3.57	-0.112
One-way commute time (minutes) [2,130]	-0.00412	-2.83	-0.0885
Commute mode dummy – bus or ferry [0,1]	-0.129	-2.26	-0.0524
Subjective Mobility			
Overall short distance [1,…,5]	-0.0731	-3.21	-0.0763
Socio-Demographics			
Number of people in the household [1, …, 8]	0.0911	4.93	0.116
Number of persons age 24-40 in household [0,…,7]	-0.0663	-2.92	-0.0678
Attitudes			
Commute benefit factor score [-2.9,2.6]	0.449	16.82	0.409
Travel freedom factor score [-2.9,2.3]	0.120	4.08	0.0922
Lifestyle			
Family/community related [-3.9,2.1]	-0.168	-5.70	-0.132
Excess Travel [1,2,3]			
How often do you travel … mainly to be alone	0.122	2.99	0.0678

[ ] = range of possible or observed responses

Adjusted R^2 = 0.346 (R^2 = 0.350) F-statistic = 71.63 (p = 0.000)

half their commute miles traveled, with travel by all other modes for all purposes summing to less than half the commute miles), and with moderate confidence for the remaining 30.9% (by identifying the mode used for the greatest proportion of total weekly distance traveled). We have no way of distinguishing driving alone from carpooling, so the personal vehicle category includes both cases. For the 1,358 commuting workers analyzed in this study, the shares of the five primary commute modes listed above are 79.4%, 9.7%, 8.2%, 2.4%, and 0.1%, respectively.

Moving to the measures of Attitude, the commute benefit factor score is, not surprisingly, by far the dominant explanatory variable in the model, with a beta coefficient more than three times larger (in magnitude) than that of the next most important variable. The travel freedom factor score is also important and supports the notion that the Liking for travel is partly based on the independence it offers. These variables are discussed further in Section 3.2.

The family/community related Lifestyle measure, which corresponds to positive responses to such statements as “My family and friends are more important to me than work” (see Table 2.5), is the second-strongest variable in the model and has a negative impact on commute Travel Liking. This result seems intuitive – the more individuals value time with their families, the less they enjoy being apart from them while commuting. This result is supported by the inclusion of the number of persons age 24 to 40 Socio-Demographic variable. Respondents having people in this age group in the household are likely to be in that age group themselves, and may be more anxious to arrive home to young families and/or active social lives.

Seemingly contradictory to these results, the Socio-Demographic measure of overall household size is *positively* related to Travel Liking. However, this result is illuminated by the Excess Travel measure, which shows that commute travel can provide a means of escape – a chance to be alone. As the household size increases, one’s liking for the solitude offered by commute travel may also increase.

The Lifestyle, Excess Travel and Socio-Demographic variables together offer a finely nuanced view of a paradox that is probably experienced by many. Although one’s primary focus may be family and social activities, many also crave time for themselves – which, in modern society, may be most readily available in the automobile during the daily commute (Edmonson, 1998). Even if commuting by public transportation, one can be alone with one’s thoughts, or otherwise engaged in solitary activities such as reading or listening to music through headphones. This result illustrates the valuable role that Attitude and Lifestyle measures play in describing Travel Liking, which, in turn, impacts Subjective Mobility and Relative Desired Mobility. Such measures greatly enhance our ability to distinguish the often conflicting behaviors and perceptions relating to travel in general, and commute travel in particular.

3.5 Short-Distance Work/School-Related

The model of work/school-related travel, shown in Table 3.4, begins to solidify the importance of certain measures (such as the travel freedom, commute benefit, status seeker, and

family/community-related factor scores) in the Liking for mandatory travel, as they again are relevant in this model.

The Objective Mobility measure of travel by other means, which enters the model with a negative coefficient, refers to travel by non-traditional modes, such as airplane, taxi, rollerblades, and boat. Those who often travel by such unusual modes may not enjoy being confined to the mundane modes usually associated with work/school-related travel.

Table 3.4: Model of Liking for Short-Distance Work/School-Related Travel (N=1,351)

Dependent Variable : Liking for short-distance work/school related travel [1, …, 5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	2.66	46.79	
Objective Mobility			
Weekly travel by other means (miles) [0,600]	-0.00271	-3.04	-0.0768
Socio-Demographics			
Number of persons 6-15 in household [0,…,3]	0.125	3.64	0.0926
Attitudes			
Commute benefit factor score [-2.9,2.6]	0.255	10.56	0.278
Travel freedom factor score [-2.9,2.3]	0.101	3.60	0.0929
Lifestyle			
Status seeker factor score [-1.7,2.7]	0.0789	3.00	0.0805
Family/community-related factor score [-3.9,2.1]	-0.112	-3.94	-0.105
Personality			
Calm factor score [-2.9,2.4]	0.0703	2.63	0.0714
Excess Travel [1,2,3]			
How often do you travel… mainly to be alone	0.165	4.27	0.110

[ ] = range of possible or observed responses

Adjusted R^2 = 0.143 (R^2 = 0.148) F-statistic = 29.14 (p = 0.000)

As with the commute model, we again see the paradoxically positive as well as negative impact of family on Travel Liking, in the negative coefficient of the family/community-related Lifestyle factor, and the positive coefficient for the number of older (age 6 to 15) children in the household and the frequency of traveling mainly to be alone.

The remaining “new” variable in this model is the calm Personality factor score, with a positive impact on Travel Liking. It is natural that those who are less ruffled by the stresses (last-minute

preparations, unexpected delays or difficulties) of traveling to a business meeting would have a greater enjoyment of that travel.

3.6 Short-Distance Entertainment/Recreation/Social

Moving from mandatory to discretionary travel, Table 3.5 presents the model of Liking for short-distance entertainment/recreation/social travel. This model contains many variables (with the same signs) as previous models, including: personal income category, travel dislike factor score, status seeker factor score, family/community-related factor score, calm personality score, and "how often do you travel … to explore new places". As similar interpretations could be applied here, a detailed discussion of these variables is not presented.

An interesting variable is the commute mode dummy variable for the rail mode. This variable enters with a positive coefficient, indicating that those who commute to work via rail modes (heavy, light, BART) enjoy traveling for social purposes more, on average, than those with a different primary commute mode. It may be that those who commute on rail have a strong desire to participate in automobile travel, but are precluded from doing so during the work trip because of congestion and/or parking costs. Social travel during non-peak times allows for congestion-free driving, which may be enjoyed more by those who are "forced" to commute via transit. Another interpretation is that traveling on common carrier modes such as rail may be an indicator of a more socially-oriented personality, which would therefore be more likely to enjoy travel for social purposes

The travel stress factor score appears in this model, and is similar to the travel dislike variable in that it represents the negative side of travel, in this case due to factors such as unsafe or nervous feelings when traveling (unsurprisingly, travel stress and travel dislike are strongly correlated, with a correlation coefficient of 0.428 – significant at the 99 percent confidence level). As expected, this variable enters the model with a negative sign, and is more prevalent in the long-distance Travel Liking models presented later in this Section. The negative impact of the frustrated Lifestyle variable (a measure associated with such statements as "I often feel like I don't have much control over my life") on the Liking for entertainment travel may represent a type of person who has a dour outlook on life in general, someone for whom life does not hold a great deal of fun.

An interesting result is the appearance of the pro-high density factor score with a negative coefficient. Such a result indicates that those with favorable high-density attitudes are less likely

to enjoy traveling for social purposes. This result could be interpreted to mean that these individuals prefer to live in an exciting neighborhood, where travel by automobile is not required when dining out or seeing a movie. These individuals probably do not associate trips on foot to these locations with travel, and their negative feelings for this type of travel may be related to experiences of having to drive long distances, or in heavy congestion, to engage in social activities.

Table 3.5: Model of Liking for Short-Distance Entertainment/Recreation/Social Travel (N=1,327)

Dependent Variable : Liking for short-distance entertainment/recreation/social travel [1,…,5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	3.35	31.38	
Socio-Demographics			
Personal income category [1,…,6]	-0.0387	-2.66	-0.0740
Commute mode dummy – rail [0,1]	0.115	2.17	0.0565
Attitudes			
Travel dislike factor score [-1.8,3.7]	-0.108	-3.79	-0.123
Pro-high density factor score [-2.5,2.3]	-0.103	-4.11	-0.111
Travel stress factor score [-1.9,2.9]	-0.106	-3.74	-0.116
Lifestyle			
Status seeker factor score [-1.7,2.7]	0.153	5.80	0.166
Frustrated factor score [-2.0,2.7]	-0.0870	-3.35	-0.0958
Family/community-related factor score [-3.9,2.1]	0.0876	3.17	0.0864
Personality			
Calm factor score [-2.9,2.4]	0.0597	2.27	0.0643
Excess Travel [1,2,3]			
How often do you travel … when you need time to think	0.0946	2.73	0.0757
… to explore new places	0.108	2.69	0.0772

[ ] = range of possible or observed responses

Adjusted R^2 = 0.118 (R^2 = 0.125) F-statistic = 17.09 (p = 0.000)

The final new variable in the model is the Excess Travel measure of traveling when needing time to think. Again referring to Figure 3.1, it is possible that this variable best captures a need for solitude and reflection. Although this may seem at odds with the social element of travel in this category, it can be quite consistent with travel for recreation, where one purpose of the recreation may be to "recharge one's mental batteries", so to speak. Given that travel to recreational activities and/or for recreational purposes (e.g. a walk or a jog) often occurs at less

congested times and places, the travel itself may contribute to this mental recharging role, and thus increase its enjoyment.

3.7 Short-Distance Personal Vehicle

In addition to inquiring about travel by purpose, as summarized in the previous sections, the survey instrument also collected data on travel by mode. Table 3.6 presents the model of Liking for all short-distance travel in a personal vehicle – with no distinction made between travel as a passenger and travel as a driver.

Table 3.6: Model of Liking for All Short-Distance Travel by Personal Vehicle (N=1,344)

Dependent Variable : Liking for all short-distance travel by personal vehicle [1,…,5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	3.697	29.27	
Objective Mobility			
Past year (log) total long distance miles [0,12.8]*	-0.0328	-2.78	-0.0729
Weekly total short-distance travel (miles) [5,1500]	-0.000524	-3.91	-0.105
Socio-Demographics			
Female [0,1]	0.106	2.32	0.0595
Attitudes			
Travel dislike factor score [-1.8,3.7]	-0.128	-4.07	-0.121
Pro-high density factor score [-2.5,2.3]	-0.133	-3.91	-0.122
Commute benefit factor score [-2.9,2.6]	0.0889	3.07	0.0871
Travel freedom factor score [-3.0,2.3]	0.200	6.30	-0.197
Pro-environmental solutions factor score [-2.3,2.4]	-0.201	-6.25	-0.195
Lifestyle			
Status seeker factor score [-1.7,2.7]	0.105	3.68	0.0959
Excess Travel [1,2,3]			
How often do you travel … by a longer route to experience more of your surroundings	0.108	2.69	0.0720

[ ] = range of possible or observed responses; * Logarithm (miles + 1) to avoid taking log of zero

Adjusted R^2 = 0. 182 (R^2 = 0.187) F-statistic = 30.72 (p = 0.000)

The Objective Mobility measures present in this model indicate that those who travel a lot (for all modes and purposes), either for long-distances or short-distances, tend to dislike travel by automobile. This result is expected.

Perhaps contrary to popular belief, our data indicates that females, all else equal, enjoy traveling in a personal vehicle more than males. It is possible that this result is partly capturing an Objective Mobility effect, since, in our sample, men engage in substantially more short-distance travel by personal vehicle than women do (men travel an average of 207 miles per week in a personal vehicle; females an average of 149 miles per week). Also, men in our sample (91%) are more likely than women (77%) to be working full-time rather than part-time, and hence, probably are more often traveling in congested traffic, which would reduce their enjoyment of travel. Other evidence (see, e.g., Sarmiento, 1996; Bernard, *et al.*, 1996) shows that women are more likely then men to be auto passengers rather than drivers, so women may experience less stress associated with auto travel. However, the possibility of a remaining gender effect after these confounding factors are accounted for is an intriguing subject for further research.

Again, the Attitude and Lifestyle measures played the strongest roles in the model. Several now-familiar variables enter into the model, namely: travel dislike, commute benefit, and travel freedom. In contrast to (but in support of) the implicit interpretation given in the previous model, the pro-high density variable in this model explicitly shows that those who enjoy a high-density neighborhood tend not to enjoy traveling in an automobile. The interpretation (including the potential for both directions of causality to apply) is similar to that of the suburban dummy in the model for short-distance overall travel, discussed in Section 3.3. The single "new" Attitude variable is the pro-environmental solutions factor score, which has a negative impact on Liking for personal vehicle travel. This result is logical: those with strong feelings for the environment probably feel traveling in a personal vehicle has negative impacts on the environment. But one can like traveling in a personal vehicle even while recognizing its negative externalities, and so it is possible that ratings of personal vehicle Travel Liking by environmentalists are subject to a social desirability bias.

Again, a measure of Excess Travel appears in the model. Here, the variable "how often do you travel … by a longer route to experience more of your surroundings" enters the model with a positive sign. The interpretation here is that those who exhibit such behavior have an underlying need to maintain a familiarity with their environment, which is best captured by this question in the survey.

3.8 Short-Distance Bus

Another mode-specific Travel Liking measure, for travel in a bus, is presented in this section (see Table 3.7). Variables common to this and the next model (Travel Liking for rail), were discussed in Section 3.2.

A few variables enter the model with expected signs. Those with higher personal incomes do not enjoy travel in a bus; those with pro-high density and pro-environmental Attitudes do enjoy travel in a bus.

Table 3.7: Model of Liking for All Short-Distance Travel by Bus (N=1,319)

Dependent Variable : Liking for all short-distance travel by bus [1,…,5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	2.426	15.64	
Socio-Demographics			
Personal income category [1,…,6]	-0.0824	-4.71	-0.125
One-way commute distance (miles) [0,…,108]	0.00707	4.04	0.109
Number of persons in HH [1,…,8]	0.0532	2.67	0.0689
Attitudes			
Pro-high density factor score [-2.5,2.3]	0.256	6.95	0.219
Commute benefit factor score [-2.9,2.6]	0.161	5.41	0.148
Pro-environmental solutions factor score [-2.3,2.4]	0.180	5.28	0.163
Lifestyle			
Workaholic factor score [-2.1,2.7]	0.104	3.14	0.0829
Personality			
Calm factor score – specific to SF [-2.9,2.4]	0.0995	2.29	0.0593
Organizer factor score [-2.9,2.6]	-0.110	-3.66	-0.0941
Mobility Limitations [1,2,3]			
Conditions which prevent or limit taking public transportation	-0.344	-3.09	-0.0800
Conditions which prevent or limit riding a bicycle	0.142	2.09	0.0543

[ ] = range of possible or observed responses

Adjusted R^2 = 0. 170 (R^2 = 0.177) F-statistic = 25.56 (p = 0.000)

One of the interesting results from this model is the inclusion of the number of persons in the household Socio-Demographic variable, with a positive coefficient. Our interpretation of this result is that those in large households may have more constraints on their automobile usage, and may, for the good of the family, prefer to take the bus and allow other members of the household to use the automobiles. The expressed Liking for bus then, while different from a

constrained preference, may represent a “post-purchase rationalization” of that preference – making a virtue out of necessity, so to speak.

Perhaps a surprising result is the presence of the workaholic Lifestyle variable entering with a positive coefficient. Workaholics, who may stereotypically be associated with automobile travel, may find they can get to work more efficiently on transit (especially on the tour bus-style commuter buses) or they may see the bus as a convenient and reliable means to enter the regional central business district (CBD). They may also value the opportunity to work while commuting that is presented by bus.

In contrast to the other models presented in this report, the models of Liking for bus and rail/train include certain variables segmented by neighborhood location. This was done because in the San Francisco Bay Area, the bus and rail service within San Francisco is starkly different than service in the suburbs of Pleasant Hill and Concord. Bus service in the City is frequent and quintessentially urban. In contrast, service in the suburbs is infrequent, though comfortable commuter buses do serve the regional CBD. Further, rail service in the City is dominated by on-street light rail service, which is more similar to local bus service; BART only services a small portion of San Francisco proper. In contrast, BART is the dominant rail mode in the suburbs.

For these reasons, we first estimated individual models for North San Francisco residents and suburban residents, and then combined them to form a single, joint model. In the bus Liking model shown in Table 3.7, only the calm Personality factor score is neighborhood-specific, associated with North San Francisco residents. This result makes sense as those easily rattled or made uneasy may not enjoy an urban bus service.

3.9 Short-Distance Rail

This section discusses the mode-specific model of Liking for rail (see Table 3.8), which includes heavy commuter rail, light urban rail, and BART (the regional rail system in the Bay Area). This model is similar to the previous model of Liking for bus, which is expected, though important differences do arise. Also, this model includes certain neighborhood-specific variables, as alluded to in the previous section.

The first neighborhood-specific variable is the female variable, entering with a negative coefficient specific to North San Francisco. It may be that females are less comfortable in driverless rail vehicles than in city buses, where the driver is always within easy contact. Those in sales

occupations, if living in the suburbs, enjoy rail, a result which could be attributed to the ease with which BART delivers passengers to the regional CBD – a prime sales market. Those in the suburbs with higher levels of education are also more likely to enjoy rail. Again, this result could be indicative of those having higher education levels being more likely to be working in the regional CBD, which has excellent (and therefore more likely to be enjoyable) rail service.

Table 3.8: Model of Liking for All Short-Distance Travel by Rail (N=1,295)

Dependent Variable : Liking for all short-distance travel by rail [1,…,5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	2.777	15.52	
Socio-Demographics			
One-way commute distance (miles) [0,…,108]	0.00425	2.21	0.0604
Luxury vehicle type dummy [0,1]	-0.460	-2.76	-0.0696
Female – specific to SF [0,1]	-0.156	-2.16	-0.0654
Sales occupation dummy – specific to suburbs [0,1]	0.296	2.42	0.0622
Educational background – specific to suburbs [1,…,6]	0.0619	4.02	0.132
Attitudes			
Pro-high density factor score [-2.5,2.3]	0.279	6.51	0.221
Commute benefit factor score [-2.9,2.6]	0.203	6.26	0.173
Pro-environmental solutions factor score [-2.3,2.4]	0.261	7.01	0.218
Lifestyle			
Family/community-related factor score [-3.9,2.1]	0.103	2.84	0.0753
Personality			
Organizer factor score [-2.9,2.6]	-0.142	-4.42	-0.113
Mobility Limitations [1,2,3]			
Conditions which prevent or limit taking public transportation	-0.560	-4.28	-0.116
Conditions which prevent or limit air travel	0.264	3.64	0.0948
Conditions which prevent or limit riding a bicycle	0.291	2.07	0.0552

[ ] = range of possible or observed responses

Adjusted R^2 = 0. 182 (R^2 = 0.190) F-statistic = 23.13 (p = 0.000)

A variable unique to this model is the luxury vehicle type dummy. The variable enters with a negative coefficient, indicating that those who drive luxury cars, not surprisingly, do not enjoy rail travel.

Two other variables of interest are the inclusion of the Mobility Limitations on air travel variable and the family/community-related Lifestyle score. Those unable or limited in their ability to travel by air may be drawn to short-distance rail travel due to their familiarity with long-distance rail

travel, used in place of air travel. The positive coefficient on the family/community-related factor score may reflect the many enjoyed family trips to tourist and shopping locations served by rail within San Francisco, taken by Bay Area families.

3.10 Short-Distance Walk/Jog/Bicycle

The final short-distance mode-specific model is Liking for non-motorized travel, specifically walking, jogging, and bicycling. This definition is a bit nebulous as it may, perhaps more so than the other categories, include both directed and undirected travel (i.e. walking, jogging, or bicycling as a means of exercise). However, the investigation allows for a comparison between the types of variables included in this model with those in more directed travel categories, such as commute travel. A summary of the coefficients is presented in Table 3.9.

Table 3.9: Model of Liking for All Short-Distance Travel by Walking, Jogging, Bicycling (N=1,299)

Dependent Variable : Liking for all short-distance travel by walking, jogging, bicycling [1,…,5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	2.811	19.70	
Socio-Demographics			
Educational background [1,…,6]	0.0595	3.08	0.0796
Number of persons age 24-40 in HH [0,…,7]	0.0933	3.81	0.0986
Number of persons age 65-74 in HH [0,1,2]	-0.180	-2.12	-0.0535
Minivan vehicle type dummy [0,1]	-0.263	-2.45	-0.0619
Single adult with children family status dummy [0,1]	0.429	2.70	0.0680
Concord neighborhood dummy [0,1]	-0.123	-2.13	-0.0558
Attitudes			
Pro-environmental solutions factor score [-2.3,2.4]	0.259	8.79	0.238
Travel dislike factor score [-1.8,3.7]	-0.0722	-2.38	-0.0663
Lifestyle			
Family/community-related factor score [-3.9,2.1]	0.0856	2.68	0.0688
Excess Travel [1,2,3]			
How often do you travel … to explore new places	0.123	2.53	0.0710
… to clear your head	0.130	2.86	0.0773
… by a longer route to experience more of your surroundings	0.106	2.34	0.0671

[ ] = range of possible or observed responses

Adjusted R^2 = 0. 182 (R^2 = 0.190) F-statistic = 23.13 (p = 0.000)

In keeping with intuition, age is an important factor in Liking for non-motorized travel – those in households with more persons age 24 to 40 (a measure which is roughly representative of the

respondent's age) enjoy this type of travel, and those with more persons age 65 to 74 do not. Also expected is the positive coefficient on the pro-environmental solutions variable and the negative coefficient on the travel dislike factor. The pro-environmental orientation is by far the strongest variable in the model, with a beta coefficient 2.5 times the magnitude of the next strongest regressor.

A variety of family/household-related variables enter the model. Those with strong family/community-related Lifestyles enjoy walking and bicycling, perhaps it offers time to be with the family. Also, single parents enjoy this type of travel more, all else equal, than their married and childless counterparts. It may be these physical activities not only provide an opportunity to be with their children, but also a time for exercise.

A handful of Excess Travel variables enter the model: those who travel often to explore new places, clear their head, or take longer than necessary routes all enjoy non-motorized travel. These variables probably represent a sense of curiosity as well as the stress relief found in exercise.

The vehicle type dummy specific to minivans enters with a negative sign. The minivan variable may be capturing the parents with multiple children who are simply unable to transport their multiple kids without a vehicle.

The Concord neighborhood is, as indicated by the model, less enjoyable for walking, jogging and bicycling than both North San Francisco and Pleasant Hill. Concord is the least dense of the three locations, perhaps making directed non-motorized travel less available and/or less appealing. Neighboring Pleasant Hill has better developed facilities for bicycling than does Concord (Schwanen and Mokhtarian, forthcoming).

3.11 Discussion of Variables Appearing in Multiple Long-Distance Models

A summary of all the long-distance models is presented in Table 3.10. Adjusted R^2s for these models range from 0.106 for work/school-related, to 0.206 for overall long distance. Similar to Section 3.2, here variables appearing in more than one of the long-distance models, with similar signs and interpretations, are discussed.

The travel dislike Attitude factor score appears in all of the long-distance models, as does the travel stress factor score, always with a negative coefficient. These two measures represent a general distaste and discomfort with travel, and it is not surprising that they are significant in

each of the models. Based on the beta coefficients, the travel dislike Attitude is the strongest variable in all five models, and travel stress is the second strongest in the overall and two purpose-specific models.

The other common variables also represent expected results. The family/community-related Lifestyle variable appears with a positive coefficient in two models. This result may suggest that long-distance travel is seen as a good opportunity to be with family, and/or a good time to anticipate visitation with family, which may often be the purpose of long-distance non-work travel. The status seeker Lifestyle score enters three models, also with a positive coefficient; status seekers may enjoy showing off a fancy car during a long trip, or enjoy the relative status of traveling for business. Finally, the Excess Travel variable of exploring new places also enters two models with a positive coefficient. As mentioned previously, this variable may best capture a sense of curiosity, which has been motivating long-distance travel throughout history (see, e.g., Pasternak, 2003).

The remaining sub-sections in Section 3 discuss the individual models of long-distance (more than 100 miles, one-way) travel. It is expected that these models will exhibit the same general patterns as the short-distance models. There are no *a priori* expectations as to how a Liking for long-distance travel may differ from a Liking for short-distance travel.

Table 3.10: Summary of Long-Distance Travel Liking Models

Explanatory variables		Dependent variable [adjusted R-squared]: Travel Liking for…				
Category	**Variable**	Overall[i] [0.206]	Work related[j] [0.106]	Ent. / soc. / rec.[k] [0.183]	Personal vehicle [0.178][l]	Airplane[m] [0.149]
Obj. Mobility	Past year work-related long-distance trips [0,230]	-				
Subjective Mobility	Long-distance work/school-related travel [1,…,5]					-
	Long-distance airplane travel [1,…,5]				-	
Attitude	Travel dislike factor score [-1.8,3.7]	-	-	-	-	-
	Travel stress factor score [-1.9,2.9]	-	-	-	-	-
	Commute benefit factor score [-2.9,2.6]				+	
	Pro-high density factor score [-2.5,2.3]		+		-	
Lifestyle	Family/community-related factor score [-3.9,2.1]			+		+
	Status seeker factor score [-1.7,2.7]	+	+		+	
	Workaholic factor score [-2.1,2.7]		+			
Personality	Adventure seeker factor score [-2.6,2.7]					+
Excess Travel [1,2,3]	… to explore new places	+		+		
	… when you need time to think			+		
	… out of your way to see beautiful scenery				+	
Mobility Limit.	Conditions which prevent or limit air travel [1,2,3]					-
Socio-Demographic	Number of full-time workers in HH [0,…,6]				-	
	Management/administrator occupation dummy [0,1]		+			
	Production-construction-crafts occupation dummy [0,1]					-
	Personal income category [1,…,6]				-	
	Number of persons age 24-40 in HH [0,…,7]			+		
	Number of persons age 41-64 in HH [0,…,3]				+	
	Two or more adults with children family status dummy [0,1]		+			
	Single adult without children family status dummy [0,1]			+		
	Educational background [1,…,6]		+			

Notes: [ ] represents variable range; N = 1345[i], 1356[j], 1351[k], 1318[l], 1354[m]; HH = household

3.12 Long-Distance Overall

The model of Liking for overall long-distance travel (irrespective of mode or purpose) is presented in Table 3.11. In general, the same pattern holds as for the short-distance models – single Objective Mobility and Excess Travel measures are included, but the model is dominated by measures of Attitude and Lifestyle.

Each of the variables entering the model is logical and clear. Those who make many long-distance business trips are more likely to dislike long-distance travel in general –indicating a

saturation level for travel. The other variables were discussed in the previous section on common variables.

Table 3.11: Model of Liking for All Long-Distance Travel (N=1,345)

Dependent Variable : Liking for all long-distance travel [1,…,5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	3.46	39.08	
Objective Mobility			
Past year work-related long distance trips [0,230]	-0.00590	-4.15	-0.102
Attitudes			
Travel dislike factor score [-1.80,3.71]	-0.347	-12.13	-0.344
Travel stress factor score [-1.87,2.92]	-0.148	-5.20	-0.141
Lifestyle			
Status seeker factor score [-1.66,2.72]	0.0513	1.98	0.0482
Excess Travel [1,2,3]			
How often do you travel … to explore new places	0.107	2.56	0.0669

[ ] = range of possible or observed responses

Adjusted R^2 = 0.206 (R^2 = 0.210) F-statistic = 70.91 (p = 0.000)

3.13 Long-Distance Work/School-Related

The long-distance model specific to work or school-related travel is summarized in Table 3.12. The only variables that are negatively associated with Travel Liking for long-distance business trips are the travel dislike and travel stress Attitude factor scores. The Socio-Demographic variables, interestingly, are all positively associated with Liking for work-related long-distance travel. Specifically, those in management or administrative jobs tend to enjoy this type of travel, perhaps due to an endogeneity effect: those who like work travel gravitate to occupations, such as managerial ones, that involve it. Those with higher educational levels are also more apt to enjoy business trips, perhaps because their education has inspired a curiosity about other places, or they engage in interesting work at their destinations. Individuals in households with children and other adults enjoy long-distance business travel, perhaps contrary to expectation. It may be that they enjoy the time to themselves, or that they simply enjoy travel more than single-adult households with children, who may be too concerned with their children at home to enjoy the travel.

The other potentially surprising result is the pro-high density factor score having a positive coefficient. Here, it is surmised that those who live in high-density areas, or simply have those types of attitudes, may enjoy the freedom and range found in long-distance travel, which occurs at a more acceptable frequency than the short-distance, routine car trips that these individuals may stereotypically dislike.

The final distinctive variable in the model is the workaholic Lifestyle factor score, which, unsurprisingly, has a positive coefficient, indicating that those who enjoy work also enjoy work-related long-distance travel.

Table 3.12: Model of Liking for Long-Distance Work/School-Related Travel (N=1,356)

Dependent Variable : Liking for long-distance work/school-related travel [1,…,5]

Explanatory Variables	Coefficient	t-statistic	Beta
Constant	2.40	26.00	
Socio-Demographics			
Management/administrator occupation dummy [0,1]	0.112	2.65	0.0691
Educational background [1,…,6]	0.0795	3.82	0.102
Two or more adults with children family status dummy [0,1]	0.0863	2.68	0.0706
Attitudes			
Travel dislike factor score [-1.80,3.71]	-0.180	-5.46	-0.160
Travel stress factor score [-1.87,2.92]	-0.165	-4.85	-0.140
Pro-high density factor score [-2.49,2.26]	0.120	3.69	0.100
Lifestyle			
Status seeker factor score [-1.66,2.72]	0.0897	2.78	0.0756
Workaholic factor score [-2.10,2.72]	0.142	4.07	0.112

[ ] = range of possible or observed responses

Adjusted R^2 = 0.106 (R^2 = 0.111) F-statistic = 21.07 (p = 0.000)

3.14 Long-Distance Entertainment/Recreation/Social

What type of person doesn't like traveling long distances on a vacation or to see family and friends? See Table 3.13 for clues. Unsurprisingly, those who dislike travel in general or find travel stressful, again, do not enjoy this type of travel – but those are the only negative indicators of Liking for long-distance entertainment travel. Again, the Socio-Demographic variables together with the significant Lifestyle variable offer a complex picture of the role of family in Travel Liking. On the one hand, the Socio-Demographic variables indicate that, on average, those in the 24 to 40 age category enjoy such travel more than their 41 to 64

counterparts (these two groups make up over 90 percent of the sample) and single adults without children enjoy such travel more than their family status counterparts (single adults with children, and multiple adults with or without children) – both results are natural. On the other hand, those with a family/community-oriented Lifestyle tend to enjoy this type of travel as it is associated with fun time with the family – also a natural result. Finally, the Excess Travel variables indicate that long-distance entertainment travel helps meet a need for curious exploration (…to explore new places) and mental rejuvenation (…when you need time to think).

Table 3.13: Model of Liking for Long-Distance Entertainment/Recreation/Social Travel (N=1,351)

Dependent Variable : Liking for long-distance entertainment/recreation/social travel [1,…,5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	3.380	31.87	
Socio-Demographics			
Single adult without children family status dummy [0,1]	0.176	3.22	0.0819
Number of persons age 24-40 in household [0,…,7]	0.0592	2.45	0.0628
Attitudes			
Travel dislike factor score [-1.80,3.71]	-0.300	-9.43	-0.278
Travel stress factor score [-1.87,2.92]	-0.153	-4.86	-0.135
Lifestyle			
Family/community-related factor score [-3.87,2.10]	0.102	3.27	0.0828
Excess Travel [1,2,3]			
How often do you travel … to explore new places	0.102	2.21	0.0597
… when you need time to think	0.0952	2.36	0.0620

[ ] = range of possible or observed responses

Adjusted R^2 = 0.183 (R^2 = 0.187) F-statistic = 44.20 (p = 0.000)

3.15 Long-Distance Personal Vehicle

Mode-specific long-distance Travel Liking models were also developed; the personal vehicle model is presented in Table 3.14 and the airplane model is discussed in the following section. The personal vehicle model follows patterns seen before, with negative coefficients holding for the travel dislike and travel stress Attitude variables, and positive coefficients holding for the commute benefit (suggesting a general fondness for time spent in an automobile) and status seeker factor scores.

Table 3.14: Model of Liking for All Long-Distance Travel by Personal Vehicle (N=1,318)

Dependent Variable : Liking for all long-distance travel by personal vehicle [1,…,5]

Explanatory Variables	Coefficient	t-statistic	Beta
Constant	3.47	27.29	
Subjective Mobility			
Long-distance airplane travel [1,…,5]	-0.0725	-3.20	-0.0873
Socio-Demographics			
Personal income category [1,…,6]	-0.0697	-3.74	-0.104
Number of persons age 41-64 in household [0,…,3]	0.0897	2.97	0.0786
Number of full-time workers in household [0,…,6]	-0.0629	-1.99	-0.0501
Attitudes			
Travel dislike factor score [-1.80,3.71]	-0.226	-6.28	-0.202
Travel stress factor score [-1.87,2.92]	-0.131	-3.81	-0.112
Pro-high density factor score [-2.49,2.26]	-0.179	-5.52	-0.152
Commute benefit factor score [-2.92,2.63]	0.0912	2.94	0.0825
Lifestyle			
Status seeker factor score [-1.66,2.72]	0.0893	2.97	0.0759
Excess Travel [1,2,3]			
How often do you travel … out of your way to see beautiful scenery	0.164	3.67	0.0992

[ ] = range of possible or observed responses

Adjusted R^2 = 0.178 (R^2 = 0.184) F-statistic = 29.43 (p = 0.000)

A Subjective Mobility variable, for long-distance airplane travel, enters the model with a negative sign, meaning that the more an individual thinks she travels in an airplane, the less she likes to travel long distances in an automobile. This result makes sense in that travel in an automobile may seem unpleasantly slow for those habituated to the speed of airplane travel. The opposite direction of causality may also be indicated: those who dislike long-distance travel by auto are more likely to make such trips by airplane.

The Socio-Demographic coefficient estimates indicate that those with higher incomes do not like traveling long distances in a personal vehicle, perhaps because their time is too valuable for this slower mode. Households with a larger number of individuals age 41 to 64 are more likely to enjoy traveling in a personal vehicle, which fits the stereotype of the older couple or family taking longer road trips, e.g. in an RV. On the other hand, it seems that personal vehicle travel is enjoyed less by those with multiple full-time workers in the household. This result may suggest that traveling by automobile, which is much slower than airplane, may be too time

consuming for households trying to balance the time demands of two or more jobs, and may also be a further manifestation of the income effect on value of time.

Arguing along the same lines, the Excess Travel variable falls naturally into the model. It serves as a reasonable proxy for those who are willing to take a slower, less convenient route in an effort to see beautiful scenery – a long-distance travel predisposition better suited to the personal vehicle mode than to the shortest/fastest airplane mode.

3.16 Long-Distance Airplane

The model for long-distance airplane travel is summarized in Table 3.15. Those who feel as though they travel a lot for work, shown in the Subjective Mobility measure, tend not to enjoy airplane travel, similar to the result for Objective Mobility found in the overall long-distance model of Section 3.12. Those who have some physiological or psychological limitation on airplane travel (Mobility Limitations) also tend not to like it – both results are expected. Again, the travel dislike and travel stress variables enter with negative signs.

Table 3.15: Model of Liking for All Long-Distance Travel by Airplane (N=1,350)

Dependent Variable : Liking for all long-distance travel by airplane [1,…,5]

Explanatory Variables	**Coefficient**	**t-statistic**	**Beta**
Constant	4.75	33.51	
Subjective Mobility			
Long-distance work/school-related travel [1,…,5]	-0.0601	-2.75	-0.0717
Socio-Demographics			
Production-construction-crafts occupation dummy [0,1]	-0.276	-2.02	-0.0511
Attitudes			
Travel dislike factor score [-1.80,3.71]	-0.240	-6.81	-0.202
Travel stress factor score [-1.87,2.92]	-0.137	-3.72	-0.110
Lifestyle			
Family/community-related factor score [-3.87,2.10]	0.0794	2.26	0.0583
Personality			
Adventure seeker factor score [-2.62,2.68]	0.105	3.13	0.0931
Mobility Limitations			
Conditions which prevent or limit air travel [1,2,3]	-0.902	-7.131	-0.181

[ ] = range of possible or observed responses

Adjusted R^2 = 0.149 (R^2 = 0.154) F-statistic = 34.80 (p = 0.000)

The only variables to enter the model with positive coefficients are in the Lifestyle and Personality categories. In view of the results seen in earlier models, the interpretation of the family/community-related Lifestyle variable is ambiguous. Depending on whether the airplane travel is accompanied or unaccompanied, and for business or pleasure, its positive coefficient may represent a utility for temporarily escaping from family obligations and/or domestic tensions, or a utility for spending quality time with the family on a trip. Those with high adventure-seeker Personality factor scores may see travel on an airplane as being part of, or an exciting gateway to, another adventure.

The production-construction-crafts occupation dummy variable enters the model with a negative sign. It may be that those in these occupations may be less familiar with airplane travel; this occupation variable is negatively and significantly correlated with the personal income category variable (coefficient of -0.101).

4. SUMMARY AND DISCUSSION

4.1 Summary and Implications

Previous stages of this on-going study have demonstrated that measures of Travel Liking are important factors in predicting how much travel is undertaken (Objective Mobility), how travel amounts are perceived (Subjective Mobility) and how much more or less travel is desired (Relative Desired Mobility). As a result, this report undertook an independent investigation of Travel Liking in the form of single-equation ordinary least-squares regression models. Using data from 1,358 commuting residents of three San Francisco Bay Area neighborhoods, Travel Liking was modeled as a function of general and travel-related Attitudes, Socio-Demographics, and travel amounts (both actual and perceived).

Separate models were developed for short-distance Travel Liking for the following categories of travel: overall, commute, work/school-related, entertainment/recreation/ social, personal vehicle, bus, rail, and non-motorized (walk, jog, and bicycle). Long-distance (trips greater than 100 miles, one-way) models were developed for: overall, work/school-related, entertainment/recreation/social, personal vehicle, and airplane. Summaries of all the models are presented in Tables 3.1 and 3.10, respectively. Examining the tables, it is clear that measures of Objective Mobility, Subjective Mobility, and even (somewhat counter to our expectations) Socio-Demographics play

a role in shaping individual Travel Liking. Nevertheless, the key variables (in terms of frequency of appearance across all the models and strength of relationship, as indicated by the magnitudes of the beta coefficients on the standardized variables) are the factor score measures of Attitudes, Personality, and Lifestyle. All but one of those 14 factors was significant in at least one of the Travel Liking models.

For short-distance travel, the commute benefit Attitude factor score appears in six of the eight models; the travel freedom Attitude and status seeker Lifestyle measures appear in four of the eight models. These variables point to three distinct bases for enjoying short-distance travel: finding local travel (notably including bus and rail as well as auto) to be a productive and important transition period (commute benefit); seeing travel as a sign of freedom and mobility – to go wherever wanted, whenever wanted (travel freedom); and wanting to show off a vehicle to others (status seekers).

Distinctly different attitude patterns take shape when examining the long-distance travel models. Here, those who find travel generally stressful or have a general dislike for travel are more likely to dislike long-distance travel (see Table 2.3 for specific statements relating to the travel stress and dislike factor scores).

These results have significant implications. For example, it is important to realize that strong feelings toward an automobile providing freedom, control and mobility, or an automobile being a status symbol, play a key role in how much individuals like to travel, which, in turn, is critical to how much they actually do travel and how much more they want to travel. Similarly, those with a strong sense of curiosity or adventure-seeking, and those who need to escape or need to connect with their surroundings, will probably voluntarily engage in travel beyond the minimum required to conduct a set of activities. And those who view travel as a useful buffer between activities, and/or are able to use travel time productively, will have a smaller disutility for travel than would be predicted by the conventional measures of travel time and cost alone, which at a minimum would reduce their incentive to reduce their travel, and at the extreme could prompt them to increase it.

Whereas previous research has shown that those who, for whatever reason, have a negative attitude toward public transit are not likely to take the bus, even if it provides service superior to an automobile, here we suggest that those who have a positive attitude toward travel in general may be less likely to engage in travel-reducing behavior, such as telecommuting or living in a

mixed-use neighborhood. Both points are important to travel behavior modeling, which generally ignores the impacts of attitudes when estimating travel patterns.

4.2 Comparison of Hypothesized Bases for Travel Liking and Model Results

This paper directly addresses the positive utility of travel recently articulated by Salomon and Mokhtarian (1998) and Mokhtarian and Salomon (2001), among others. Salomon and Mokhtarian (1998, p. 136) hypothesized that in "some people and in some contexts, travel for its own sake is valued due to one or more … character traits or desires". They went on to list a number of traits/desires, which were introduced at the beginning of this report. In Table 4.1 we compare these hypothesized traits/desires, along with two other traits (curiosity and escape/therapy) not included in the 1998 paper, with the results from the Travel Liking models presented in this report. The table indicates generally strong support for all originally hypothesized traits (note that several variables in the models relate to more than one trait). Although, after all, the survey was designed specifically to capture a number of these traits, it is noteworthy that Travel Liking arises from such a variety of sources. The most important positive ly associated factors appear to be status, independence, curiosity and variety-seeking, and the escape/therapeutic benefits of traveling, as well as a craving for transition time between work and home and the synergy effects of trip chaining. The most important negatively associated variables were travel dislike and travel stress. These factors represent reasons why travel is generally expected to be a disutility, but viewed in the opposite way, it can be said that a positive Travel Liking is partly defined by a person's *refusal* to see travel as boring, stressful, unsafe, and so on.

4.3 Directions for Future Research

Researchers should continue to investigate the impact of attitudes on travel behavior as well as continue to search for methods of forecasting attitudes. Specific directions for future research include the need to capture attitudes more rigorously, through more and better defined questions/surveys. For example, a key personality trait that was not measured directly in our study is curiosity, which was represented by a proxy variable in several of the models. More questions in future work should be aimed at capturing curiosity in more detail. Similarly, the benefits of trip chaining (included in Salomon and Mokhtarian, 1998 under "synergy") are not well-captured here, present only through the single statement ("It is nice to be able to do errands on the way to and from work") loading relatively lightly on the Travel Freedom factor score. In the Travel Liking context, an individual may enjoy travel because it provides the oppor-

Table 4.1: Comparison of Hypotheses and Travel Liking Model Results

Hypothesized trait or desire	Evidence in TL Models?	Travel Liking Model(s)	Explanatory Variable Category	Explanatory Variable
Adventure- or variety-seeking	Yes	LD Airplane	Personality	Adventure-seeking factor score
		SD Entertainment, SD Walk, LD Overall, LD Entertainment	Excess Travel	How often do you travel to explore new places?
Independence	Yes	SD Overall, SD Commute, SD Work/School-Related, SD Personal vehicle	Attitude	Travel freedom factor score
Control	Somewhat	SD Bus, SD Rail	Personality	Organizer factor score (negative direction)
Status	Yes	SD Overall, SD Work/School-Related, SD Entertainment, SD Personal vehicle, LD Overall, LD Work-related, LD Personal vehicle	Lifestyle	Status seeker factor score
		SD Rail	Socio-Demographics	Luxury vehicle type (negative direction)
Buffer	Yes	SD Overall, SD Commute, SD Work/School-Related, SD Personal vehicle, SD Bus, SD Rail, LD Personal vehicle	Attitude	Commute benefit factor score
Exposure to the environment	Yes	SD Personal vehicle, SD Walk	Excess Travel	How often do you travel by a longer route to experience more of your surroundings?
Scenery or other amenities	Yes	SD Personal vehicle, SD Walk	Excess Travel	… by a longer route to experience more of your surroundings?
		LD Personal vehicle	Excess Travel	… out of your way to see beautiful scenery?
Synergy (multiple activities)	Yes	SD Overall, SD Commute, SD Work/School-Related, SD Personal vehicle, SD Bus, SD Rail, LD Personal vehicle	Attitude	Commute benefit factor score
Curiosity	Yes	SD Entertainment, SD Walk, LD Overall, LD Entertainment	Excess Travel	How often do you travel to explore new places?
		SD Personal vehicle, SD Walk	Excess Travel	… by a longer route to experience more of your surroundings?
Escape/Therapy	Yes	SD Entertainment, LD Entertainment	Excess Travel	… when you need time to think?
		SD Commute, SD Work/School-Related	Excess Travel	… mainly to be alone?
		SD Overall	Excess Travel	… just to relax?
		SD Walk	Excess Travel	… to clear your head?
		SD Work/School-Related	Socio-Demographic	Number of persons age 6-15 in household
		LD Work-related	Socio-Demographic	Two or more adults with children family status

Notes: SD = Short-distance, LD = Long-distance, TL = Travel Liking, Walk = walk/jog/bicycle, Entertainment = entertainment/recreation/social

tunity to engage in other activities, e.g. traveling to the dry cleaners may allow an individual to shop at the music store next door or at a garage sale encountered along the way.

Also, it would be interesting to track travel attitudes of the same sample through time. This would allow for insight into the stability of travel attitudes over time, which would lend itself to predicting errors on possible forecasts of attitudes.

Regarding the explicit measure of Travel Liking, future studies should continue to address the natural tendency of respondents to confound their feelings about travel with their feelings about the activities at the destination (as discussed in Section 3). Despite our explicit urging to concentrate on travel itself, it is likely that even respondents who read those instructions found it difficult to separate their feelings cleanly. Further research could address this concern through more focused attention to these particular variables than was possible in our broad survey, ideally through interactive probing and confirmation of responses. For example, the "teleportation test", suggested by Mokhtarian and Salomon (2001) ("If you could instantaneously be teleported to a desired location, would you prefer doing that more than traveling there in the conventional way?") may be a useful way to get respondents to identify the relative strengths of the various reasons for traveling (see Handy, *et al.*, 2004 for an application of this test).

From a technical standpoint, future analysis of these data will use structural equations modeling (SEM) to further refine the inter-relationships present among our four key dependent variable categories (Objective Mobility, Subjective Mobility, Travel Liking, and Relative Desired Mobility). In the single-equation models presented here, certain causality assumptions had to be made (such as the relationship between Objective Mobility and Travel Liking discussed in Section 3.1). Both directions of causality are plausible, and SEM will help identify the extent to which each direction holds.

REFERENCES

Albertson, LA (1977) Telecommunications as a travel substitute: Some psychological, organizational, and social aspects. *Journal of Communication*, Vol. 27, No. 2, pp. 32-43.

Anable, Jillian and Birgitta Gatersleben (2004) All work and no play? The positive utility of travel for leisure compared to the journey to work. Unpublished manuscript, available from the authors.

Arentze, T.A. and H.J.P. Timmermans (2004) Information gain, novelty-seeking, and travel: A model of dynamic activity-travel behavior under conditions of uncertainty. Unpublished manuscript, available from the authors.

Babbie, Earl (1998) *The Practice of Social Research*, 8th ed. Belmont, CA: Wadsworth Publishing Company.

Bernard, Anne, Annarita Polacchini, Anne-Marie Séguin, and Yves Bussière (1996) Household structure and mobility patterns of women in O-D surveys: Methods and results based on the case studies of Montreal and Paris. Paper presented at the Second National Conference on Woemen's Travel Issues, Baltimore, MD, October 24-26.

Beroldo, Steve (2002) Commute *Profile 2002: A Survey of San Francisco Bay Area Commute Patterns*. RIDES for Bay Area Commuters, Inc., October. The author may be contacted at sberoldo@rides.org.

Burton, Robert (1621) *The Anatomy of Melancholy, Volume II*. E.g., reprinted from an 1893 edition by AMS Press, Inc., New York, 1973.

Choo, Sangho, Gustavo O. Collantes, and Patricia L. Mokhtarian (forthcoming) Wanting to travel, more or less: Exploring the determinants of a perceived deficit or surfeit of personal travel. *Transportation*.

Collantes, Gustavo O. and Patricia L. Mokhtarian (2002) Determinants of Subjective Assessments of Personal Mobility. Research Report UCD-ITS-RR-02-11, Institute of Transportation Studies, University of California, Davis, August.
Available at http://its.ucdavis.edu/publications/2002/RR-02-11.pdf.

Curry, R.W. (2000) Attitudes toward Travel: The Relationships among Perceived Mobility, Travel Liking, and Relative Desired Mobility. Master's Thesis, Department of Civil and Environmental Engineering, University of California, Davis, June.
Available at http://its.ucdavis.edu/publications/2000/RR-00-06.pdf.

Dobson, Ricardo, Frederick Dunbar, Caroline J. Smith, David Reibstein, and Christopher Lovelock (1978) Structural models for the analysis of traveler attitude-behavior relationships. *Transportation*, Vol. 7, pp. 351-363.

Dumas, Joseph S. and Ricardo Dobson (1979) Linking consumer attitudes to bus and carpool usage. *Transportation Research A,* Vol. 13, pp. 417-423.

Edmonson, Brad (1998) In the driver's seat. *American Demographics*, March, pp. 46-52.

Handy, Susan L., Lisa Weston, and Patricia L. Mokhtarian (2004) Travel by choice or necessity? The case of the soccer mom and other stories. Available from the authors.

Hiscock, Rosemary, Sally Macintyre, Ade Kearns, and Anne Ellaway (2002) Means of transport and ontological security: Do cars provide psycho-social benefits to their users? *Transportation Research Part D*, Vol. 7, pp. 119-135.

Higano, Yoshiro and Isao Orishimo (1990) Impact of spatially separated work places on urban residential location, consumption and time allocation. *Papers of the Regional Science Association*, Vol. 68, pp. 9-21.

Jensen, Mette (1999) Passion and heart in transport – a sociological analysis of transport behaviour. *Transport Policy*, Vol. 6, pp. 19-33.

Kitamura, Ryuichi, Patricia L. Mokhtarian, and Laura Laidet (1997) A micro-analysis of land use and travel in five neighborhoods in the San Francisco Bay Area. *Transportation*, Vol. 24, No. 2, pp. 125-158.

Larson, Jan (1998) Surviving commuting. *American Demographics,* July, pp.55ff.

Mackett, Roger L., Lindsey Lucas, James Paskins and Jill Turbin (2004) The therapeutic value of children's everyday travel. Unpublished manuscript, available from the authors.

Marsh, P. and P. Collett (1986) *Driving Passion: the Psychology of the Car*. Boston, Faber and Faber.

Metropolitan Transportation Commission (MTC) (2001a) Travel Forecasts for the San Francisco Bay Area 1990 – 2025 Auto Ownership, Trip Generation, and Trip Distribution: Data Summary. Available at www.mtc.ca.gov.

Metropolitan Transportation Commission (MTC) (2001b) 1998 Base Year Validation of Travel Demand Models for the San Francisco Bay Area (BAYCAST-90). Technical Summary. Available at www.mtc.ca.gov.

Mokhtarian, Patricia L. and Ilan Salomon (1997) Modeling the desire to telecommute: The importance of attitudinal factors in behavioral models. *Transportation Research A*, Vol. 31, No. 1, pp. 35-50.

Mokhtarian, Patricia L. and Ilan Salomon (2001) How derived is the demand for travel? Some conceptual and measurement considerations. *Transportation Research A*, Vol. 35, No. 8, pp. 695-719.

Mokhtarian, Patricia L., Ilan Salomon, and Lothlorien S. Redmond (2001) Understanding the demand for travel: It's not purely "derived". *Innovation: The European Journal of Social Science Research* Vol. 14, No. 4, pp. 355-380.

Nordlund, Annika M. and Jorgen Garvill (2003) Effects of values, problem awareness, and personal norm on willingness to reduce personal car use. *Journal of Environmental Psychology*, Vol. 23, pp. 339-347.

Ory, David T., Patricia L. Mokhtarian, Lothlorien S. Redmond, Ilan Salomon, Gustavo O. Collantes, Sangho Choo (2004) When is commuting desirable to the Individual? Forthcoming in *Growth and Change*.

Pasternak, Charles (2003) *Quest: The Essence of Humanity*. Chichester, England: John Wiley and Sons.

Redmond, Lothlorien S. (2000) *Identifying and Analyzing Travel-related Attitudinal, Personality, and Lifestyle Clusters in the San Francisco Bay Area*. Master's Thesis, Transportation

Technology and Policy Graduate Group, Institute of Transportation Studies, University of California, Davis, September. Research Report UCD-ITS-RR-00-08. Available at www.its.ucdavis.edu/publications/2000/RR-00-08.pdf.

Richter, J. (1990) Crossing boundaries between professional and private life. In: Grossman H & Chester L (eds) *Behavioral Travel-Demand Models* (pp 143-163). Hillsdale NJ: Lawrence Erlbaum, Hillsdale NJ.

Sachs, W. (1992) *For Love of the Automobile: Looking Back into the History of our Desires*. Translated from German by Reneau, D., Berkeley, University of California Press. Originally published as *Die Liebe zum Automobil: ein Rückblick in die Geschichte unserer Wünshce*, 1984.

Salomon, Ilan and Patricia L. Mokhtarian (1998) What happens when mobility-inclined market segments face accessibility-enhancing policies? *Transportation Research D,* Vol. 3, No. 3: 129-140.

Sarmiento, Sharon (1996) Household, gender, and travel. Chapter 3 in *Proceedings, Second National Conference on Women's Travel Issues*. USDOT FHWA Publication No. FHWA-PL-97-024, October, pp. 35-52.

Schwanen, Tim and Patricia L. Mokhtarian (forthcoming) The extent and determinants of dissonance between actual and preferred neighborhood type. *Environment and Planning B,* Vol. 31.

Shamir, Boas (1991) Home: The perfect workplace? In: Zedeck, Sheldon (ed) *Work and Family* (pp 273-311). San Francisco CA: Jossey-Bass.

Stagl, Justin (1995) A *History of Curiosity: The Theory of Travel 1550-1800*. Chur, Switzerland: Harwood Academic Publishers.

Stanton-Jones, Kristina (1992) An *Introduction to Dance Movement Therapy in Psychiatry.* London: Tavistock/Routledge.

Steg, Linda (2004) Car use: Lust and must. Instrumental, symbolic and affective motives for car use. Unpublished manuscript, available from the author.

Steg, Linda, Charles Vlek, Goos Slotegraaf (2001) Instrumental-reasoned and symbolic-affective motives for using a motor car. *Transportation Research F*, Vol. 4, pp. 151-169.

Tanner, Carmen (1999) Constraints on environmental behavior. *Journal of Environmental Psychology*, Vol. 19, pp. 145-157.

Tertoolen, Gerard, Dik van Kreveld and Ben Verstraten (1998) Psychological resistance against attempts to reduce private car use. *Transportation Research Part A*, Vol. 32, No. 3, pp. 171-181.

Tischer, Mary Lynn and Robert V. Phillips (1979) The relationship between transportation perceptions and behavior over time. *Transportation*, Vol. 8, pp. 21-36.

Wachs, M. and M. Crawford (eds.) (1992) *The Car and the City: The Automobile, the Built Environment, and Daily Urban Life*. Ann Arbor, MI: University of Michigan Press.

Zitnik, Lou (2004) Powerful replicators: Hemingway's desire to commute. Unpublished manuscript, available from the author.

A. APPENDIX: DESCRIPTIVE STATISTICS OF VARIABLES

Table A.1: Distributions for Short-Distance Travel Liking Variables

Short-Distance Travel Liking			
Variable	**Response**	**Frequency**	**Percent**
Overall	strongly dislike	15	1.1%
	dislike	178	13.1%
	neutral	762	56.1%
	like	360	26.5%
	strongly like	43	3.2%
	all	1,358	100.0%
Commute	strongly dislike	123	9.1%
	dislike	424	31.2%
	neutral	520	38.3%
	like	254	18.7%
	strongly like	37	2.7%
	all	1,358	100.0%
Work/School-Related	strongly dislike	64	4.7%
	dislike	292	21.5%
	neutral	749	55.2%
	like	227	16.7%
	strongly like	26	1.9%
	all	1,358	100.0%
Entertainment/Recreation/Social	strongly dislike	6	0.4%
	dislike	66	4.9%
	neutral	543	40.0%
	like	605	44.6%
	strongly like	138	10.2%
	all	1,358	100.0%
Personal Vehicle	strongly dislike	34	2.5%
	dislike	125	9.2%
	neutral	410	30.2%
	like	647	47.6%
	strongly like	142	10.5%
	all	1,358	100.0%

Bus	strongly dislike	389	28.6%
	dislike	473	34.8%
	neutral	384	28.3%
	like	103	7.6%
	strongly like	9	0.7%
	all	1358	100.0%
Rail	strongly dislike	161	11.9%
	dislike	231	17.0%
	neutral	540	39.8%
	like	384	28.3%
	strongly like	42	3.1%
	all	1358	100.0%
Walk/Jog/Bicycle	strongly dislike	54	4.0%
	dislike	66	4.9%
	neutral	332	24.4%
	like	663	48.8%
	strongly like	243	17.9%
	all	1358	100.0%

Table A.2: Distributions for Long-Distance Travel Liking Variables

Long-Distance Travel Liking			
Variable	**Response**	**Frequency**	**Percent**
Overall	strongly dislike	19	1.4%
	dislike	119	8.8%
	neutral	368	27.1%
	like	671	49.4%
	strongly like	181	13.3%
	all	1,358	100.0%
Work/School-Related	strongly dislike	153	11.3%
	dislike	331	24.4%
	neutral	576	42.4%
	like	267	19.7%
	strongly like	31	2.3%
	all	1,358	100.0%
Entertainment/Recreation/Social	strongly dislike	23	1.7%
	dislike	83	6.1%
	neutral	320	23.6%
	like	597	44.0%
	strongly like	335	24.7%
	all	1,358	100.0%
Personal Vehicle	strongly dislike	48	3.5%
	dislike	211	15.5%
	neutral	420	30.9%
	like	563	41.5%
	strongly like	116	8.5%
	all	1,358	100.0%
Airplane	strongly dislike	54	4.0%
	dislike	130	9.6%
	neutral	272	20.0%
	like	632	46.5%
	strongly like	270	19.9%
	all	1,358	100.0%

Table A.3: Descriptive Statistics for Continuous Explanatory Variables

Continuous Explanatory Variables				
Category	**Variable**	**N**	**Mean**	**Std. Dev.**
Objective Mobility (SD)	Weekly commuting distance (miles)	1,357	125.8	136.5
	Weekly total short-distance travel (miles)	1,357	217.9	180.1
	Weekly travel by other means	1,357	2.72	22.5
	One-way commute time (minutes)	1,357	29.85	20.48
	One-way commute distance (miles)	1,356	13.99	14.6
Objective Mobility (LD)	Past year (log) total long distance miles	1,345	8.32	1.97
	Past year work-related long distance trips	1,345	5.27	14.9
Attitudes	Travel dislike factor score	1,358	0.000203	0.86
	Travel stress factor score	1,358	0.000545	0.82
	Commute benefit factor score	1,358	-0.008379	0.87
	Travel freedom factor score	1,358	0.006436	0.74
	Pro-environmental solutions factor score	1,358	0.000686	0.86
	Pro-high density factor score	1,358	0.003685	0.81
Lifestyle	Family/community-related factor score	1,358	0.07271	0.75
	Status seeker factor score	1,358	-0.00320	0.81
	Workaholic factor score	1,358	0.01041	0.76
	Frustrated factor score	1,358	0.03870	0.83
Personality	Organizer factor score	1,358	0.01943	0.81
	Adventure seeker factor score	1,358	0.05672	0.90
	Calm factor score	1,358	-0.03991	0.81

Table A.4: Distributions for Ordinal Explanatory Variables

Ordinal Explanatory Variables				
Category	**Variable**	**Response**	**Frequency**	**Percent**
Subjective Mobility	Overall short-distance travel	none	3	0.2%
		2	177	13.1%
		3	502	37.3%
		4	345	25.6%
		a lot	320	23.8%
		all	1347	100.0%
	Long-distance work/school-related travel	none	603	44.4%
		2	399	29.4%
		3	170	12.5%
		4	85	6.3%
		a lot	100	7.4%
		all	1357	100.0%
	Long-distance airplane travel	none	170	12.5%
		2	506	37.3%
		3	335	24.7%
		4	222	16.4%
		a lot	124	9.1%
		all	1357	100.0%
Socio-Demographics	Suburban dummy	0	687	50.6%
		1	671	49.4%
		all	1358	100.0%
	Concord neighborhood dummy	0	1040	76.6%
		1	318	23.4%
		all	1358	100.0%
	Number of full-time workers	0	102	7.5%
		1	659	48.7%
		2	519	38.3%
		3	58	4.3%
		4	12	0.9%
		5	2	0.1%
		6	2	0.1%
		all	1354	100.0%
	Management/administrator occupation dummy	0	1061	78.3%
		1	294	21.7%
		all	1358	100.0%
	Sales occupation dummy	0	1234	91.1%
		1	121	8.9%

	all	1355	100.0%
Production-construction-crafts occupation dummy	0	1305	96.3%
	1	50	3.7%
	all	1355	100%
Professional occupation dummy	0	706	52.1%
	1	649	47.9%
	all	1355	100.0%
Personal income category	less than 15k	96	7.2%
	$15k to 35k	282	21.3%
	35k to 55k	406	30.6%
	55k to 75k	241	18.2%
	75k to 95k	132	9.9%
	more than 95k	170	12.8%
	all	1327	100.0%
Number of persons age 6-15 in household	0	1132	83.8%
	1	126	9.3%
	2	93	6.1%
	3	10	0.7%
	all	1351	100.0%
Number of persons age 24-40 in household	1	648	48.0%
	2	340	25.2%
	3	310	22.9%
	4	37	2.7%
	5	10	0.7%
	6	4	0.3%
	7	2	0.1%
	all	1351	100.0%
Number of persons age 41-64 in household	0	578	42.8%
	1	389	28.8%
	2	378	28.0%
	3	6	0.4%
	all	1351	100.0%
Number of persons age 65-74 in household	0	1288	95.3%
	1	48	3.6%
	2	15	1.1%
	all	1351	100.0%
Number of persons in household	1	339	25.1%
	2	510	37.7%
	3	243	18.0%
	4	183	13.5%
	5	51	3.8%

		6	19	1.4%
		7	5	0.4%
		8	1	0.1%
		all	1351	100.0%
	Two or more adults with children family status dummy	0	1016	75.2%
		1	335	24.8%
		all	1351	100.0%
	Single adult without children family status dummy	0	1017	75.3%
		1	334	24.7%
		all	1351	100.0%
	Commute mode dummy -- bus or ferry	0	1225	90.3%
		1	132	9.7%
		all	1357	100.0%
	Commute mode dummy -- rail	0	1245	91.7%
		1	112	8.3%
		all	1357	100.0%
	Luxury vehicle type dummy	0	1274	97.5%
		1	33	2.5%
		all	1307	100.0%
	Minivan vehicle type dummy	0	1241	95.0%
		1	66	5.0%
		all	1307	100.0%
	Female gender dummy	0	660	48.8%
		1	692	51.2%
		all	1352	100.0%
	Educational background	< h.s. diploma	6	0.4%
		h.s. diploma	73	5.4%
		< college degree	328	24.2%
		college degree	460	33.9%
		some graduate	151	11.1%
		graduate degree	338	24.9%
		all	1356	100.0%
Excess Travel	How often do you travel … just to relax	never/seldom	507	37.3%
		sometimes	739	54.4%
		often	112	8.2%
		all	1358	100.0%
	… to explore new places	never/seldom	158	11.6%
		sometimes	953	70.2%
		often	247	18.2%
		all	1358	100.0%
	… when you need time to	never/seldom	723	53.2%

	think	sometimes	556	40.9%
		often	79	5.8%
		all	1358	0.0%
	… out of your way to see beautiful scenery	never/seldom	174	12.8%
		sometimes	887	65.3%
		often	297	21.9%
		all	1358	100.0%
	… by a longer route to experience more of your surroundings	never/seldom	472	34.8%
		sometimes	778	57.3%
		often	108	8.0%
		all	1358	100.0%
	… mainly to be alone	never/seldom	906	66.7%
		sometimes	416	30.6%
		often	36	2.7%
		all	1358	100.0%
	… to clear your head	never/seldom	885	65.2%
		sometimes	425	31.3%
		often	48	3.5%
		all	1358	100.0%
Mobility Limitations	Conditions which prevent or limit air travel	no limitation	1316	97.1%
		limits how often/long	34	2.5%
		absolutely prevents	6	0.4%
		all	1356	100.0%
	Conditions which prevent or limit taking public transportation	no limitation	1255	92.6%
		limits how often/long	71	5.2%
		absolutely prevents	30	2.2%
		all	1356	100.0%
	Conditions which prevent or limit riding a bicycle	no limitation	1317	97.1%
		limits how often/long	30	2.2%
		absolutely prevents	9	0.7%
		all	1356	100.0%