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UNDERSTANDING THE DEMAND FOR TRAVEL: IT'S NOT PURELY "DERIVED"

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ABSTRACT

We contest the derived demand paradigm for travel as a behavioral absolute. To the contrary, we suggest that travel has an intrinsic positive utility and is valued for its own sake, not just as a means of reaching a destination. We argue that the same positive characteristics that lead people to engage in travel as a recreational activity in itself, are likely to motivate them to engage in apparently excess travel in the context of their mandatory and maintenance activities as well. This paper explores the conceptual basis of a positive utility for travel, and presents some results from an ongoing empirical study of attitudes toward travel. In modeling distance traveled (in each of 11 categories), we found that subjective variables such as Travel Liking, the adventure-seeker Personality trait, the travel stress Attitudinal factor, and the Excess Travel indicator added considerable explanatory power to the Demographic variables traditionally used in such models. It appears that, far from being completely determined by demographically-based needs, the amount of travel demanded is heavily influenced by one's attitudes toward travel. This is not only true for discretionary (entertainment) purposes as would be expected, but for more "mandatory" purposes such as work/school-related activities as well. We are convinced that the demand for travel arises from a fundamental human need for mobility and other subjective characteristics, as well as from the external causes typically measured. To more accurately forecast travel demand and policy response, the role of those subjective characteristics needs to be understood much better than we do at present.

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1. INTRODUCTION

The truism that "travel is a derived demand" – meaning that travel is not pursued for its own sake but only as a means of accessing desired activities in other locations – appears in virtually every textbook on transportation planning, engineering, or economics, and has dominated our professional approach to transportation planning and policymaking for decades. We fully agree that most travel is utilitarian or purposive – directed to the goal of relocating from one desired activity venue to another one. However, we contest the derived demand paradigm for travel as a behavioral absolute. To the contrary, we suggest that travel has an intrinsic positive utility and is valued for its own sake, not just as a means of reaching a destination. To the extent that this is true – and that extent will vary by person, travel mode, purpose, and circumstance – the policy and planning implications could be profound.

This paper explores the conceptual basis of a positive utility for travel, including a brief review of key concepts developed in previous publications (Salomon and Mokhtarian, 1998; Mokhtarian and Salomon, 2001; Redmond and Mokhtarian, 2001a). It then offers some new results from an ongoing empirical study of attitudes toward travel.

2. EARLIER PERSPECTIVES ON THE POSITIVE UTILITY OF TRAVEL

2.1 The Academic Transportation Literature

Our contention that travel has a positive utility of its own is neither original nor unique to us. To the contrary, similar observations appear in the scholarly transportation literature dating back more than a quarter-century, made by a variety of authors from different disciplines and of different geographical origins. In several cases, these scholars comment on the implications of this view for policymaking and for forecasting. For example, Israeli geographer Shalom Reichman (1976, pp. 148-149) refers to the inelasticity of travel demand in response to increases in fuel prices. He writes:

> "Transportation planners traditionally assumed that the main function of transportation is instrumental, or that it is consumed to achieve some secondary goal … But now, the question ought to be raised whether the revealed price inelasticity of transportation is solely a reflection of the rigidity of these tangible secondary goals, or whether the inflexibility has deeper roots, which should be sought in the less tangible realm of human needs and values. In other words, is transportation only a means to an end, or does it really fulfill some ends in itself… Transportation … may be considered as fulfilling a basic human need, namely that of freedom, or the right to move. If the existence of such a need were to be accepted, … then the existing approach to transportation as a means only is no longer justified. Stated alternatively, the notion that travel is essentially a disutility that should be minimized is no longer uniquely acceptable…"

British civil engineer/transportation planning professor Peter Jones (1978, p. 298) notes, "destination choice is almost without exception viewed as a trade-off between the (negative) costs of travel and the (positive) benefits enjoyed at the destination. Yet this is really an over-simplification of the problem… It would thus seem more realistic to view the destination choice process as an interactive trade-off between the positive and negative features of both travel and destination options…"

In arguing for a "right of mobility", American political scientist Gerald Houseman (1979) refers to "the intrinsic relationship between movement and personal freedom" (p. 9), comments that "there appears to be a common sense preference for a life of movement and, with it, a life of variety" (p. 14), and then draws an important contrast between access and mobility, one that is

quite timely, even 22 years later. He first quotes from a United Kingdom transportation planning document (*Changing Directions*, 1974, p. 106) that articulately makes the case for substituting access for mobility:

> " 'Mobility' is not an easy concept to define. In ordinary parlance, it usually refers to the ease with which a person can move about or the amount of movement he performs. But what is important is not movement as such; it is *access to people and facilities*. Access, not movement, is the true aim of transport… An immobile person may have water and gas at the flick of a switch, have his refuse collected, receive calls from his doctor, and deliveries from the shops, be informed and entertained by wireless and television, talk to his friends on the telephone, all without stirring from his house... While possibly less mobile in the ordinary sense of the word than someone who travels greater distances to work, school and recreation or to visit friends, he may nevertheless be better placed, since the act of travel, with the time, cost, and personal effort involved, is something which he usually would prefer to avoid."

Houseman's immediate response (pp. 19 and 20) is:

> " 'Access' is sometimes a handy term to use in discussions of mobility or mobility-related issues, and it is quite popular among transport-conscious and environmentally oriented writers. The term is not a good substitute for 'mobility', however, for it refers only to a limited number of circumstances in which access may be operative in place of physical mobility… [I]t is not even a good substitute for physical mobility, for it describes something other than mobility. In many cases, as outlined above, it describes immobility. It can even mean, apparently without consultation with immobile persons, an assumption of the undesirability of a right of mobility for them… The adoption of access as a social goal in place of mobility may at first blush appear to be a broader and more useful approach, but the most cursory examination shows that this is deceptive."

Dutch transportation consultant Geurt Hupkes (1982, pp. 41-42) acknowledges the psychological basis of a desire for mobility, and observes that the utility for travel has not only "derived" but "intrinsic" components (Swedish psychologist Tommy Garling, *et al.* (2000) make a similar conceptual distinction between "utilitarian" and "hedonic" attitudes toward driving). In Hupkes' words:

> "Most authors … see travel as an activity with a secondary utility, … purchased only to facilitate the consumption of final goods and services… To my thinking this is only partly true. Man is mobile. He cannot easily stay indoors all day long. He wants to 'exercise his legs', 'get a breath of fresh air' and feels satisfaction in the mere act of moving, in taking his body and mind from one place to another… This quality of travel can be called intrinsic utility. The other component of travel, derived from the utilities of activities which become possible by travelling, can be called derived utility. When added together, the two components provided the total utility of travel time."

Hupkes goes on to relate the intrinsic utility of travel to "such satisfactions as change of environment, being in movement, the sensation of speed and freedom, the excitement of handling a powerful vehicle, feeling pride of ownership of such a vehicle etc." He notes that for most people, derived utility dominates the total, but "it is well known that there are people with a strong aversion towards travel, and others who simply cannot get enough of it".

Italian systems analyst Cesare Marchetti (1994, p. 75) refers to "the systematic mismatch between the results of cost benefit analysis and the actual behavior of travelers", and suggests that this is because "personal travel appears to be much more under the control of basic instincts than of economic drives." He maintains that "man is a territorial animal", that "the *basic instinct* of a territorial animal is to *expand its territory*", and that there is a "*quintessential unity of traveling instincts around the world*" (italics original).

Among the literature that may be considered both scholarly and popular (to varying degrees in different cases), one category is especially relevant to this context: treatments of the social impacts of the automobile. Numerous books (e.g., Lewis and Goldstein, 1983; Flink, 1975; Marsh and Collett, 1986; Sachs, 1992; Wachs and Crawford, 1992) refer to what might be considered emotional elements of the utility of the automobile, beyond its rational contribution to meeting the derived demand for efficient transportation. Among other traits, the automobile is viewed as conferring status, freedom and independence; as a means for exploration, satisfaction of curiosity or variety-seeking behavior; and as a source of entertainment and of gratification at its skillful control.

2.2 Other Literature

Finally, popular-audience literature should not be overlooked as a source of insight into the positive utility of travel. If the desire for mobility is as universal a human condition as some of the authors cited above suggest, evidence of that desire should be manifest in works written for general audiences. Such evidence is ample. A number of authors throughout history have displayed a spirit diametrically opposed to the concept of traveling purely in order to reach a desired destination, or taking the shortest route. For instance, in the *Travel Journal* documenting their journey from France to Italy via Germany and Switzerland in 1580-1581, the secretary of Michel de Montaigne (1533-1592) writes (Frame, 1957, p. 915):

> "If someone complained to him that he often led his party, by various roads and regions, back very close to where he had started (which he was likely to do, either because he had been told about something worth seeing, or because he had changed his mind according to the occasions), he would answer that as for him, he was not going anywhere except where he happened to be, and that he could not miss or go off his path, since he had no plan but to travel in unknown places; and that provided he did not fall back upon the same route or see the same place twice, he was not failing to carry out his plan… [S]o he took such pleasure in traveling that he hated to be nearing each place where he was to rest…"

Montaigne himself (*Essays*, III.9, "Of Vanity") writes of the pleasure to be obtained from traveling, referring to motives of variety-seeking, mental stimulation, and escape (Frame, 1957, pp. 723, 728, 743, 744, 747):

> "Among human characteristics, this one is rather common:… to love movement and change… This greedy appetite for new and unknown things indeed helps to foster in me the desire to travel, but enough other circumstances contribute to it. I gladly turn aside from governing my house… Absent from home, I strip off all such thoughts [of the cares of managing an estate]… I ordinarily reply to those who ask me the reason for my travels, that I know well what I am fleeing from, but not what I am looking for… Besides these reasons, travel seems to me a profitable exercise. The mind is continually exercised in observing new and unknown things; and I know no better school… than to set before it constantly the diversity of so many other lives, ideas, and customs, and to make it taste such a perpetual variety of forms of our nature… I undertake [a journey] neither to return from it nor to complete it; I undertake only to move about while I like moving. And I walk for the sake of walking."

The Scottish author Robert Louis Stevenson (1850-1894), in his 1879 work *Travels with a Donkey in the Cevennes* (see, e.g., the 1913 edition), echoes a similar sentiment. Regarding two of his stops on an exploratory tour of the remote French highlands, he comments on the barrenness of their surroundings and then writes, "Why any one should desire to visit either Luc or Cheylard is more than my much-inventing spirit can suppose. For my part, I travel not to go anywhere, but to go. I travel for travel's sake. The great affair is to move …"

These selections obviously do not reflect a random sample of travelers, but illustrate the extreme of a love of travel for its own sake that appears with markedly less intensity in other people (Montaigne's travel companions, for example). However, other authors generalize these personal descriptions, and suggest that all human beings are innately designed for mobility to some extent. In his classic 1621 work *The Anatomy of Melancholy*, Robert Burton (1577-1640) advocates motion as a cure for melancholy, writing: "The Heavens themselves run continually round, the Sun riseth and sets, … Stars and Planets keep their constant motions, the air is still tossed by the winds, the waters ebb and flow … to teach us that we should ever be in action." After describing a number of "exercises" that should ameliorate melancholy, he suggests that "the most pleasant of all outward pastimes is that of … a merry journey now and then with some good companions, to visit friends, see Cities, Castles, Towns, … to walk amongst Orchards, Gardens, Bowers, Mounts…"

Similarly, in his 1660 *Pensees*, French philosopher Blaise Pascal (1623-1662) writes: "Our nature consists in motion; complete rest is death… I have discovered that all the unhappiness of men arises from one single fact, that they cannot stay quietly in their own chamber." In the same and succeeding Parts he writes at some length on the human inclination toward "diversion" (another way of describing variety-seeking behavior, which often manifests itself in travel), and indicates that "we like the chase better than the quarry" (or, at least symbolically, the journey better than the destination) – although he also notes that many people do not realize this about themselves. (Montaigne makes a similar observation [Frame, 1957, p. 745]: "Enjoyment and passion are principally a matter of imagination. It embraces more warmly what it is in quest of than what we have at hand, and more continually").

Drawing on some of these and other sources, as well as his own experience, English adventurer Bruce Chatwin (1940-1989) has written extensively and eloquently on our restless nature. For example (Chatwin, 1989, pp. 221-222 and 273):

> "[W]e should perhaps allow human nature an appetitive drive for movement in the widest sense. The act of journeying contributes towards a sense of physical and mental well-being, while the monotony of prolonged settlement or regular work weaves patterns in the brain that engender fatigue and a sense of personal inadequacy. Much of what the ethologists have designated 'aggression' is simply an angered response to the frustrations of confinement... The tenacity with which nomads cling to their way of life, as well as their quick-witted alertness, reflects the satisfaction to be found in perpetual movement. As settlers, we walk off our frustrations. The medieval Church instituted the pilgrimage *on foot* as a cure for homicidal spleen…" "Man's real home is not a house, but the Road, and ... life itself is a journey to be walked on foot."

Chatwin's assessment of aggression as an "angered response to the frustrations of confinement" finds an ironic manifestation in modern instances of "road rage", in which aggression may be considered a response to the frustrations of not moving as freely as expected, that is, in which even the automobile, symbol of personal freedom, can become confining under congested conditions. Not all occasions of road rage occur in congestion, however, and it must be concluded that other complex factors are at work as well.

3. IMPLICATIONS FOR URBAN TRAVEL

This limited sampling of quotations, from among the vast number of a similar nature, serves at least to illustrate, although not to prove, the universality of a drive to travel. They point to the observation that, rather than travel always being a means to reach a desired activity, sometimes travel is itself the activity that is desired. The critical reader may object: "That may be the case

for recreational travel, but in the context of urban transportation planning, the local travel essential to carrying out one's daily activities is of a different character." The main importance of these examples to the present discussion is what they might tell us with respect to derived travel, i.e. travel as a means to reach a desired destination.

We believe that even ostensibly derived trips can be valued for their own sake to varying degrees – that the inherent desire to travel described by the above writers manifests itself in "necessary" travel as well as in recreational travel. Specifically, the bases of a positive utility for undirected travel can apply to directed travel as well: the sensation of speed[1]; the exposure to the environment and movement through the environment; the ability to control movement in a demanding and skillful way; the enjoyment of scenic beauty or other attractions of a route, not just a destination; variety- or adventure-seeking; curiosity; escape; and the symbolic value of mobility (including as a status symbol, but also potentially as a symbol of independence and/or control). *Even in the context of mandatory and maintenance travel*, any or all of these factors may contribute to making a more distant destination (or a longer route) more attractive than it would be on the basis of the characteristics of the destination alone, resulting in "excess travel" (from the cost-minimization standpoint) when that more distant destination or longer route is chosen. How much travel is excessive from this perspective is an interesting research question – one to which our ongoing project is offering partial results, but which can only be answered definitively with further research.

The preceding discussion has addressed two aspects of the utility for travel. The first aspect is simply the utility of arriving at the destination, which is the traditional "derived demand" justification for travel. The other aspect is the utility of travel itself (Hupkes' "intrinsic utility"), based on the characteristics described above. We now point out that there is an additional aspect to the utility for travel – the utility of activities that can be conducted while traveling. These activities – such as talking on the phone, listening to music, thinking, relaxing, reading, talking to companions – at a minimum reduce the disutility of travel, thereby making travel more attractive at the margin, and at a maximum actually increase the positive utility of the trip.

We conceptually define "excess travel" as travel beyond that which is necessary to reach a desired destination; that is, travel generated due to the second and third components of utility. In practice, of course, this definition can be quite challenging to operationalize, since the three components of utility can be difficult to distinguish – for the traveler as well as the analyst. Mokhtarian and Salomon (2001) discuss at length this tripartite nature of the utility for travel, and its implications for the analysis of travel demand

[1] Mumford (1938), in discussing the avenue as "the most important symbol and the main fact about the baroque city", writes that "[m]ovement in a straight line along an avenue was not merely an economy but a special pleasure: it brought into the city the stimulus and exhilaration of swift motion, which hitherto only the horseman had known galloping over the fields or through the hunting forest" (pp. 94-95). Although this image is counter to the modern stereotype of congested urban highways (not to mention an ideal that was not always achieved even in earlier times), the point is that the pleasure of speed can be a desired accompaniment to urban travel. The quest for that pleasure may lead, for example, to the choice of longer but higher-speed routes to a given destination, the choice of a more distant destination than necessary because the route to it can be traveled at higher speeds, the choice of a high-performance automobile that may further prompt a desire to travel for its own sake, and so on.

4. AN EMPIRICAL STUDY OF ATTITUDES TOWARD TRAVEL

4.1 Description of the Study Setting and Data Collection

To further improve our understanding of the positive utility for travel, we designed and administered a 14-page questionnaire that collects data on a variety of related measures. The survey was mailed in May 1998 to 8,000 residents of three neighborhoods in the San Francisco (California) Bay Area: half were mailed to an urban neighborhood of North San Francisco, and the other half were split evenly between two contiguous but different suburbs of Concord and Pleasant Hill. These three communities were chosen to represent a variety of land use, travel, and demographic patterns, and hence (presumably) a spectrum of attitudes toward travel. A randomly-selected adult (over age 18) in each household was asked to complete the survey.

With an overall response rate of more than 25%, after discarding responses with too much missing data we retained about 1,900 cases for further study. Due to the sampling biases (in the selection of particular neighborhoods, although sampling within neighborhoods was entirely random) and self-selection in responding, the sample cannot be assumed to be perfectly representative of the general population. However, although the *descriptive distributions* of variables measured are not necessarily generalizable, the *relationships* that we find among variables are expected to have broad applicability. In particular, our findings serve to support the existence of a positive utility for travel and help identify its implications, even if the precise distribution of that utility across the population is uncertain.

Table 1 presents a description of the sample in terms of key demographic and other variables. Although not all these variables are shown in the table, Redmond (2000) confirms that the sample is roughly representative of the population in terms of gender, age distribution within household, and average commute time. On the other hand, the sample overrepresents those with higher incomes and education (a typical survey response bias), and two-person households (with households having just one person, or three or more people, being underrepresented).

[Table 1 goes here]

4.2 Measurement of Key Concepts

As background to the concepts described below, it should be noted that in the cover letter to the survey, travel was defined as "moving any distance by any means of transportation – from walking around the block to flying around the world." In questions relating to the amount of travel conducted or desired by respondents, they were asked (borrowing wording from the American Travel Survey) to exclude "travel you do as an operator or crew member on a train, airplane, truck, bus, or ship."

Most of the variables measured by the questionnaire can be grouped into 11 categories: Objective Mobility, Subjective Mobility, Relative Desired Mobility, Travel Liking, Attitudes, Personality, Lifestyle, Excess Travel, Mobility Constraints, Travel Modifiers, and Demographics. The eight categories germane to the current paper are briefly described below. Measurement challenges associated with the study of travel for its own sake, including specific limitations and suggestions for improvement of the measures we used, are discussed in more detail in Mokhtarian and Salomon (2001).

The three mobility categories and the Travel Liking category had similar structures. In each case, measures were obtained both overall and separately by purpose and mode, for short-distance and long-distance travel. In keeping with the American Travel Survey, long-distance trips were defined as those longer than 100 miles, one way. The short-distance modes measured were: personal vehicle, bus, Bay Area Rapid Transit/light rail/train, walking/jogging/cycling, and other. The short-distance purposes measured were: commuting to work or school, work/school-related, grocery shopping, eating a meal, and taking other people where they need to go. Long-distance measures were obtained for the personal vehicle and airplane modes, and for the work/school-related and entertainment/social/recreational purposes.

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". Frequency of trips by mode was not obtained (a conscious design choice, to reduce the burden on the respondent). Respondents were also asked to specify how many miles they traveled each week, in total and by mode and purpose.

For long-distance trips, respondents simply tabulated how many trips they made "last year" for each mode-purpose combination (personal vehicle/work, personal vehicle/entertainment, etc.), to each of nine regions of the world. Those responses indicated number of trips directly, and were also transformed to approximate measures of distance, through judgmental average distances developed between the Bay Area and each of the nine world areas.

Travel Liking

To directly measure the affinity for travel, the question was asked, "How do you feel about *traveling* in each of the following categories? We are *not* asking about the activity at the destination, but about the travel required to get there." Respondents were then asked to rate each of the overall, mode-, and purpose-specific categories on a five-point scale from "strongly dislike" to "strongly like".

Attitudes

The survey contained 32 attitudinal statements related to travel, land use, and the environment, to which individuals responded on the five-point Likert-type scale from "strongly disagree" to "strongly agree". Factor analysis was then used to extract the relatively uncorrelated fundamental dimensions spanned by these 32 variables. Six underlying dimensions were identified, using principal axis factoring with oblique rotation (see Redmond, 2000 for details): travel dislike, pro-environmental solutions, commute benefit, travel freedom, travel stress, and pro-high density.

Table 2 presents the pattern matrix showing which statements are most strongly associated with each factor. Three pairs of factors were somewhat highly correlated: pro-environmental solutions with pro-high density (0.38), and travel dislike with commute benefit (-0.29) and with travel stress (0.26). However, these correlations are not strong enough to constitute a collinearity threat in models involving all the Attitudinal factors as explanatory variables.

[Table 2 goes here]

Personality

Respondents were asked to indicate how well (on a five-point scale from "hardly at all" to "almost completely") each of 17 words and phrases described their personality. Each of these traits was hypothesized to relate in some way to one's orientation toward travel, or to reasons for wanting to travel for its own sake. These 17 attributes reduced to four personality factors: adventure-seeker, organizer, loner, and the placid personality.

Table 3 presents the pattern matrix showing which traits are most strongly associated with each Personality factor. The two most highly-correlated factors were calm and adventure-seeker (-0.30); no other correlations exceeded 0.17.

[Table 3 goes here]

Lifestyle

The survey contained 18 Likert-type scale statements relating to work, family, money, status and the value of time. These 18 questions comprised four lifestyle factors: status seeker, workaholic, family/community-oriented and a frustrated factor. These variables are expected to affect Attitudes toward travel or Travel Liking, as well as the Travel Modifiers not analyzed here.

Table 4 presents the pattern matrix showing which statements are most strongly associated with each Lifestyle factor. The two most highly-correlated factors were frustrated and workaholic (0.31); no other correlations exceeded 0.18.

[Table 4 goes here]

Excess Travel

Thirteen statements asked how often (on a three-point scale: "never/seldom", "sometimes", "often") the respondent engaged in various activities that would be considered unnecessary or excess travel, such as traveling "just to be alone" or "just for the fun of it". The question was kept as mode- and context-neutral as possible. Specifically, respondents were asked, "Keeping in mind that travel is going any distance by any means, how often do you travel..." in each of the thirteen ways. An Excess Travel indicator was created by assigning the values 0, 1, and 2, respectively, to the possible responses, and summing the responses across the 13 individual Excess Travel activities. This variable can be considered an indicator of Objective Mobility, but also has a psychological flavor indicating an enjoyment of travel beyond the purely utilitarian. The index may indicate a strong desire for travel generally, or a preference for discretionary travel which may have a negative relationship with mandatory travel for such purposes as commuting and taking others where they need to go.

Mobility Constraints

In our study, Mobility Constraints are physical or psychological limits on travel, that may affect both the amount an individual travels and her enjoyment of that travel. In the survey, these constraints are measured by questions concerning limitations on traveling by certain modes or at

certain times of day (with ordinal response categories "no limitation", "limits how often or how long", and "absolutely prevents"), and the availability of an automobile when desired.

Demographics

Finally, the survey included an extensive list of Demographic variables to allow for comparison to other surveys and to Census data. These variables include neighborhood and car type dummies, age, years in the U.S., education and employment information, and household information such as number of people in the household, their age group, and personal and household income.

4.3 Models of Objective Mobility

The study of this extremely rich data set is ongoing, and a number of reports and papers have been produced to date (Salomon and Mokhtarian, 1998; Curry, 2000; Redmond, 2000; Redmond and Mokhtarian, 2001a; Redmond and Mokhtarian, 2001b; Choo and Mokhtarian, 2001; Collantes and Mokhtarian, 2001; Choo, *et al.*, 2001; Mokhtarian and Salomon, 2001). To this point, the analysis has focused on simple descriptive statistics and on modeling the major endogenous concepts described in Section 4.2, one by one. These single-equation models constitute a useful initial approach to exploring the many relationships among the key concepts, and in this section we summarize the empirical results obtained from our single-equation models of Objective Mobility. However, we have formulated a conceptual model representing the multiple interrelationships among these concepts simultaneously, and after further refinement of the conceptual model based on interim single-equation results, we envision estimating a structural equations model of the entire system of relationships.

If travel is indeed demanded for its own sake to some extent, it is only natural to wonder, "to what extent"? Can we quantify what proportion of travel is "excess" versus "derived"? Our data offer the opportunity to *begin* to answer this question, although we stress that it is *only* a beginning.

We developed regression models for (natural log transformations of) 11 measures of distance traveled: short-distance total plus several modes and purposes separately, and long-distance total plus the two modes (personal vehicle and airplane) and purposes (work-related, entertainment) on which we collected data. These models were estimated on the subset of respondents who commuted at least once a month, on the assumption that commuting workers will differ substantially from non-commuters in the factors determining the amounts they travel in various categories.

Models of the amount of travel demanded are in some ways the foundation of urban transportation planning: trip generation models (the number of trips demanded) constitute the first stage of the four-stage regional travel demand forecasting process (see, e.g., Oppenheim, 1995), and models of vehicle- or personal-kilometers traveled are also quite common. In the regional forecasting context, trip generation is generally modeled as a function of demographic characteristics such as income, household size, and vehicle ownership. The models presented here are distinctive in their incorporation of travel-related Attitudes, Lifestyle, and Personality as explanatory variables, in addition to the traditional Demographic factors.

Attitudinal variables have often been incorporated into mode choice models developed for research purposes (as opposed to regional planning/forecasting purposes). They have also occasionally been incorporated into other models of trip-making behavior (e.g. Dobson, *et al*., 1978; Dumas and Dobson, 1979; Tischer and Phillips, 1979; Kitamura, *et al*., 1997). Those studies, however, focused on modeling numbers or shares of trips by specific modes, as a function of attitudes toward the same modes, with the logical hypothesis that positive attitudes toward a given mode will increase its use. Without modeling total travel in some way, however, such equations are at least as much mode choice models as trip generation models, since increases in the use of one mode may occur at the expense of others. To our knowledge, the current study is the first to model the quantity of *total* travel demanded or generated, as a function of attitudes toward travel *itself* (of course, we also model distance traveled by mode, and include mode-specific travel attitudes among the explanatory variables).

The results of these Objective Mobility models must be treated with caution, for at least two reasons. The first reason is the approximate nature of the measurement of distances traveled (especially the long-distance variables), as mentioned in Section 4.2. However, the relative comparisons of Table 6 below are likely to be robust with respect to these measurement errors. The second, and more important, reason for caution is that the single-equation models reported here are subject to simultaneity (or endogeneity) bias due to the inclusion of variables endogenous to the entire system as explanatory variables, thereby violating the requirement of ordinary least squares regression that the explanatory variables be uncorrelated with the error term. Thus, a more rigorous analysis of the impact of an affinity for travel on actual distance traveled must await the development of the structural equations model in which simultaneity will be appropriately handled. Nevertheless, the current results are useful as preliminary indicators of the effects we are likely to see in the later analysis.

Estimated coefficients and t-statistics for each of the 11 models, plus their interpretations and other details of the analysis, are found in Redmond and Mokhtarian (2001b). Here, we present a qualitative summary (Table 5) indicating the direction of impact of each significant variable in each model. The first observation is that the Demographic variables normally used to model travel demand play major roles here as well, generally in expected ways. Income is significant and positive in nine of the 11 models. Vehicle availability variables appear (positively) in several models. Household size variables have mixed but logical impacts, positively affecting the amount of work/school-related short-distance travel, but negatively associated with short-distance entertainment travel and total and airplane long-distance travel. Age has a negative impact on distance traveled for commuting, entertainment (short-distance), and by airplane. Gender also has mixed impacts, in some cases surprising. All else equal, women travel less for commuting, short-distance overall, and long-distance work-related purposes than do men, consistent with many other studies. On the other hand, contrary to expectation, they travel farther than men for long-distance entertainment and by airplane. Most of the prior empirical evidence on gender differences, though, relates to local travel; much less is known about such differences in long-distance travel, and this result points to a fascinating direction for further research.

The dummy variables for residential neighborhood are also prominent, suggesting (with many other studies) that land use patterns do have some effect on travel behavior. Specifically, suburban residents tend to travel more in short-distance categories (except that they walk less), and less in long-distance categories (except that they drive more), than their urban counterparts. Again, these are generally expected effects. Interestingly, while suburban residents have longer

commutes than urban dwellers, other work/school-related travel (both short- and long-distance) appears to be comparable for the two groups.

In addition to the usual Demographic variables, however, our Attitude, Personality, Lifestyle, Excess Travel, and Travel Liking variables are also important to explaining the travel distance demanded in each category. For example, either the adventure seeker Personality factor or the Excess Travel indicator (or both) appears in every model except the one for commuting, with a positive impact on miles traveled in each case. While the absence from the commuting model is not especially surprising, what may be surprising is the presence of these variables in models for other "mandatory" travel, namely short- and long-distance travel for work/school-related purposes. The implication is that even mandatory travel may have a discretionary element – that those who value travel for its own sake are more likely to seek out (or create) and remain in jobs involving work-related travel, or to volunteer for optional work assignments involving travel.

[Table 5 goes here]

Table 6 presents an approximate quantification of the impacts of several of these variables on the amount of travel demanded: Travel Liking, the travel stress Attitudinal factor, the adventure seeker Personality factor, and the Excess Travel indicator. The columns of the table represent the given explanatory variable taking on five different values. For Travel Liking, those values are simply the five points of the ordinal scale on which it was measured, coded from 1 to 5. For the two standardized factor scores, the points are 0, +/-1, and +/-2, roughly corresponding to the sample mean, and one and two standard deviations above and below the sample mean (the correspondence is not exact, since the means and standard deviations differ slightly for this subsample of the entire data set, but the integer points are chosen for convenience). For the Excess Travel indicator, the points are 0, 4, 8, 12, and 16, corresponding approximately to the sample mean (7.97) plus or minus one and two standard deviations (4.26), respectively. The cells of the table are the predicted number of miles traveled in the row category, when the given explanatory variable takes on the column value, and all other explanatory variables are evaluated at their sample means. The final column of the table presents the percentage change in miles traveled for someone with a higher value of the given explanatory variable, compared to someone having a reference value.

[Table 6 goes here]

The results are intriguing – demonstrating sizable effects of the selected variables on miles traveled. For example, all else equal, people who "liked" long-distance personal vehicle travel (scoring 4 on the 5-point scale) covered nearly 60% more long-distance personal vehicle miles than those who were "neutral" about that type of travel (scoring 3). People who liked long-distance work/school-related trips, traveled more than twice as far as those who were neutral (the per-person distances in this category shown in Table 6 are small because they include a sizable proportion of the sample who made few or no such trips, but presenting the numbers in this way is important for understanding the relative magnitudes of each type of travel in the sample as a whole, not just among those who engage in a given type of travel).

People whose score on the adventure seeker factor was about one standard deviation above the mean traveled 21% farther per week for short-distance work-related activities than those having approximately the mean score on this factor. The same people traveled 16% farther in a personal vehicle per week, 48% farther in an airplane per year, and 88% farther per year for long-distance

work-related activities than did their "average" counterparts. Overall, the plus-one-standard-deviation adventure-seekers traveled 21.7 more short-distance miles per week, and 1,040 more long-distance miles per year, than those of only average adventure-seeking inclinations.

We examined the impact of the travel stress factor to illustrate that the effect on distance traveled of these subjective variables is not always positive. For example, all else equal, people having a travel stress score about one standard deviation above the mean traveled 19% (about 780) fewer miles a year for long-distance trips than those with an average travel stress score.

It can legitimately be argued that the greater amounts of travel by travel- likers and adventure-seekers are not necessarily "excess" (representing travel purely for its own sake, or for the sake of concomitant activities) – they may simply represent a logical distribution of the travel that "needs" to be done (travel required to reach desired destinations), in proportion to the extent that travel is enjoyed by the individual. For example, if one member of a household considers grocery shopping travel to be an adventure, that person is likely to be the one doing the normal grocery shopping for that household, without *necessarily* inventing excess grocery shopping trips (although the latter outcome is certainly a possibility as well).

However, the frequently significant impact of the Excess Travel indicator (ETI) weakens this argument. Recall that the ETI ranges from 0 to 26, where each of 13 excess travel activities is given a score of 0 if it is seldom or never done by the respondent, 1 if it is done sometimes, and 2 if it is done often. The sample mean is 8 and the standard deviation is about 4; hence someone who never engages in excess travel would fall about two standard deviations below the mean. It is relevant to take such a person as the benchmark, as representing "typical" behavior if all travel were purely derived (although part of the point is that it is not, in fact, typical for all travel to be purely derived, since the sample mean ETI is not close to 0). Table 6 shows that the individual with an average ETI travels between 21 and 105% more miles in the various categories than does the person with an ETI of 0. Nevertheless, although by definition an "Excess Traveler" must generate some miles that are excess, it is still unknown what proportion of the additional miles seen for Excess Travelers constitutes truly gratuitous travel, as opposed to being a consequence of natural sorting mechanisms that will allocate *needed* travel in greater amounts to those who enjoy it (and conversely, lesser amounts to those who are stressed by it).

In any case, although the specific numbers presented here can only be viewed as tentative, the qualitative message is clear: rather than being purely mechanically derived from demographically-driven "needs", at least some component of travel is generated by Attitudinal and other such characteristics. That is, the travel distance demanded on the basis of traditional Demographic trip generation mechanisms (household size, number of vehicles, income) can be stretched or shrunk by non-trivial amounts depending on Attitudes, Travel Liking, Personality, and other variables. All else equal, being an adventure seeker directly translates to traveling more, and being stressed by travel directly translates to traveling less. Thus, improving our understanding of the demand for travel, and the response to policies or trends affecting that demand, requires that we better understand the role of these subjective variables in moderating the "objectively-generated" demand.

5. CONCLUSIONS

In this paper we have presented what is, to us, a compelling picture of the intrinsic utility of travel – that is, a desire to travel for its own sake, and not just as the necessary means to the end

of accessing a desired activity location. We have marshaled a diverse group of respected transportation academics and professionals who have previously written in a similar vein, and we have identified writers for popular audiences who have spoken eloquently of an innate restlessness, curiosity, and adventure-seeking spirit in humankind. We have argued that the same positive characteristics that lead so many people to engage in travel as a recreational activity in itself, are likely to motivate people to engage in apparently excess travel in the context of their mandatory and maintenance activities as well.

We believe that a positive affinity for travel, like most characteristics, is universal to some extent, but distributed unevenly across the population, depending on personality, lifestyle, travel-related attitudes, mobility constraints, demographic characteristics, and the mode and purpose of a particular trip. To explore further the nature of this distribution and its implications for travel behavior, we designed and administered a survey to collect data on the variables of interest.

Although measurement of these concepts is imperfect, we have found substantial empirical support for the positive utility of travel in our analyses to date. In modeling the Objective Mobility of commuting workers (specifically distance traveled, in each of 11 categories), we found that subjective variables such as Travel Liking, the adventure-seeker Personality, the travel stress Attitude, and the Excess Travel indicator added considerable explanatory power to the Demographic variables traditionally used in such models. The results indicate that far from being completely determined by demographically-based needs, the amount of travel demanded is heavily influenced by one's attitudes toward travel. This is not only true for discretionary (entertainment) purposes as would be expected, but for more "mandatory" purposes such as work/school-related activities as well (although it is notably not true for commuting itself – the one category for which only Objective Mobility and Demographic variables were found to be significant).

The issues raised in this paper have clear policy implications: the way people will react to policies intended to reduce vehicle travel will depend in part on the relative weights they assign to the three components of a utility for travel, and on whether they desire more or less mobility than they currently experience. Although non-travel alternatives are available that may partially satisfy the various utility components, those alternatives will often not be as desirable as traveling.

To improve our understanding of travel behavior, several general suggestions for further research present themselves. First, we should begin to view travel not just as a disutility, but as a literal "good" having both positive and negative characteristics. As with many other decisions, a reasonable model is to assume that people weigh the pros and cons of their travel and related non-travel alternatives, and choose travel when its pros outweigh its cons by a greater amount than for the alternatives. Some of the cons (disadvantages) of travel are universally accounted for in demand modeling – specifically time and cost. Others are more subjective but potentially important, such as the travel stress Attitudinal factor identified in our work and found significant in several models of distance traveled. The only pro, or advantage, of travel that is universally accounted for is the utility of reaching a destination. We have stressed throughout this paper that the other advantages, related to activities that can be conducted while traveling and to the benefits of travel itself, should not be neglected. There is no insurmountable reason why we cannot begin to develop more realistic models, containing a more complete set of variables that people evaluate in making their travel decisions.

The second suggestion for further research is to recognize that different people will differently weight the three components of the utility for travel, and that their particular combination of

weights could substantially affect their travel-related decisions. Thus, it would seem important to (a) segment the population based on their weight profiles; (b) assess the proportions of people in each segment (e.g., for what proportion of the population are the second and third components of travel utility negligible, for what proportion is the second component strong but the third component negligible, and so on); and (c) develop different travel demand models by segment, on the premise that people who weight the different components of travel utility differently are likely also to weight other typical explanatory variables differently.

Finally, it would be of great interest to perform comparison studies in various parts of the world. Our belief that a human need for mobility is fundamental and universal is supported by the variety of authors speaking to such a need, as quoted in Section 2. However, there are doubtless many cultural variations in the distribution of the intensity of a positive utility for travel, the way it is manifested (e.g. mode- and purpose-specific differences) and its relationship to travel behavior and other characteristics. To more accurately forecast travel demand and policy response in different contexts, these issues need to be understood much better than we do at present.

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Table 1: Key Demographics of Sample (N=1904)

CHARACTERISTIC		COUNT (PERCENT)			
		Total	**North San Francisco**	**Pleasant Hill**	**Concord**
% of sample		1904 (100)	888 (46.6)	543 (28.5)	473 (24.8)
Have a driver's license [T1, N1, C1]		1857 (97.7)	854 (96.4)	541 (99.6)	462 (97.9)
Age category [T1, N1, C1]					
	23 or younger	61 (3.2)	35 (4.0)	15 (2.8)	11 (2.3)
	24 – 40	691 (36.3)	439 (49.5)	130 (23.9)	122 (25.8)
	41 – 64	894 (47.0)	332 (37.5)	294 (54.1)	268 (56.8)
	65 – 74	155 (8.2)	48 (5.4)	59 (10.9)	48 (10.2)
	75 or older	100 (5.3)	32 (3.6)	45 (8.3)	23 (4.9)
Educational background [T2, N2, C1]					
	Some grade school or high school	15 (0.8)	8 (0.9)	4 (0.7)	3 (0.6)
	High school diploma	126 (6.6)	25 (2.8)	34 (6.3)	67 (14.2)
	Some college or technical school	506 (26.6)	152 (17.1)	188 (34.6)	166 (35.2)
	4-year college/technical school degree	603 (31.7)	328 (37.0)	158 (29.1)	117 (24.8)
	Some graduate school	211 (11.1)	110 (12.4)	49 (9.0)	52 (11.0)
	Completed graduate degree(s)	441 (23.2)	264 (29.8)	110 (20.3)	67 (14.2)
Current employment status [T3, P1]					
	Full-time	1249 (65.6)	640 (72.1)	325 (60.0)	284 (60.0)
	Part-time	267 (14.0)	128 (14.4)	79 (14.6)	60 (12.7)
	Homemaker	60 (3.2)	16 (1.8)	24 (4.4)	20 (4.2)
	Non-employed student	25 (1.3)	13 (1.5)	5 (0.9)	7 (1.5)
	Unemployed	37 (1.9)	19 (2.1)	7 (1.3)	11 (2.3)
	Retired	265 (13.9)	72 (8.1)	102 (18.8)	91 (19.2)
Occupation category [T4, N3, P1, C2]					
	Homemaker	88 (4.6)	23 (2.6)	42 (7.7)	23 (4.9)
	Service/repair	97 (5.1)	38 (4.3)	33 (6.1)	26 (5.5)
	Sales	165 (8.7)	72 (8.2)	45 (8.3)	48 (10.2)
	Production/construction/ crafts	79 (4.2)	30 (3.4)	16 (2.0)	33 (7.0)
	Manager/administrator	388 (20.5)	179 (20.3)	120 (22.1)	89 (18.9)
	Clerical/administrative support	195 (10.3)	80 (9.1)	67 (12.4)	48 (10.2)
	Professional/technical	844 (44.5)	445 (50.4)	212 (39.1)	187 (39.7)
	Other	40 (2.1)	16 (1.8)	7 (1.3)	17 (3.6)

CHARACTERISTIC	MEAN (STANDARD DEVIATION)			
	Total	**North San Francisco**	**Pleasant Hill**	**Concord**
Ideal one-way commute time (minutes) [T5, N4, P2, C3]	16.3 (8.8)	16.4 (8.4)	16.0 (8.9)	16.5 (9.2)
Actual one-way commute				
… time (minutes) [T6, N5, P3, C4]	29.7 (21.1)	28.1 (18.3)	30.8 (21.8)	31.7 (25.2)
… distance (miles) [T7, N6, P4, C5]	14.5 (20.2)	11.1 (17.7)	17.5 (14.6)	18.5 (27.8)
Number of personal vehicles per HH [T8, N7, C2]	1.9 (1.8)	1.5 (1.0)	2.2 (1.2)	2.4 (3.0)
Percent of time vehicle is available [T4, N7, P5, C6]	90.8 (25.6)	83.6 (33.4)	98.5 (8.4)	95.6 (16.8)
Number of persons in HH	2.4 (1.2)	2.1 (1.2)	2.4 (1.2)	2.7 (1.3)
Number of workers in HH [T9, N8, P6, C7]	1.6 (0.9)	1.6 (0.9)	1.5 (0.9)	1.6 (1.0)

Note: In the following listing of sample sizes, T stands for Total, N stands for North San Francisco, C stands for Concord, and P stands for Pleasant Hill. Percents are based on non-missing responses.

T1 = 1901	T2 = 1902	T3 = 1903	T4 = 1896	T5 = 1531	T6 = 1420
T7 = 1394	T8 = 1899	T9 = 1872	N1 = 886	N2 = 887	N3 = 883
N4 = 825	N5 = 700	N6 = 687	N7 = 885	N8 = 875	C1 = 472
C2 = 471	C3 = 417	C4 = 337	C5 = 330	C6 = 470	C7 = 466
P1 = 542	P2 = 489	P3 = 383	P4 = 377	P5 = 541	P6 = 531

Source: Redmond (2000).

Table 2: Pattern Matrix for Attitude Factors (Commuters only, N=1427)

FACTOR LABEL ➔ / VARIABLE ⬇	Travel Dislike	Pro-environmental Policy	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 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				
I limit my auto travel to help improve congestion and air quality		0.372				
We can find cost-effective technological solutions to the problem of air pollution		0.353				
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		
It is nice to be able to do errands on the way to or from work				0.269		
I am willing to pay a toll to travel on an uncongested road				0.212		

FACTOR LABEL ➔ / VARIABLE ⬇	Travel Dislike	Pro-environmental Policy	Commute Benefit	Travel Freedom	Pro-high Density	Travel Stress
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 to have 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

Note: Because four of the attitudinal statements pertained to the commute and hence were not applicable to those who did not commute, the factor analysis was performed only for commuters, and then factor scores for the five factors other than commute benefit were calculated for the remainder of the sample by applying the factor score coefficients derived from the commuters to the responses of the non-commuters on the rest of the attitudinal statements in this section.

Source: Redmond (2000).

Table 3: Pattern Matrix for Personality Factors (N=1904)

FACTOR LABEL ➔ / VARIABLE ⬇	Adventure Seeking	Organizer	Loner	Calm
adventurous	0.776			
variety seeking	0.695			
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 4: Pattern Matrix for Lifestyle Factors (N=1904)

FACTOR LABEL ➔ / VARIABLE ⬇	Frustrated	Family/ Community-Oriented	Status Seeking	Work-aholic
I often feel like 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 wins			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).

Table 5: Summary of Objective Mobility Models

DEPENDENT VARIABLE ➔	SHORT DISTANCE						LONG DISTANCE				
	Total	Commute	Work/School	Entertainment	Personal Vehicle	Walk/Jog/Cycle	Total	Work/School	Entertainment	Personal Vehicle	Airplane
N	1308	1313	1313	1301	1308	1351	1263	1307	1298	1335	1302
R^2	0.391	0.330	0.113	0.139	0.523	0.265	0.278	0.220	0.201	0.104	0.294
Adjusted R^2	0.388	0.328	0.107	0.131	0.520	0.261	0.268	0.214	0.193	0.097	0.286
EXPLANATORY VARIABLE											
Objective Mobility											
Commute speed	+	+	+		+						
Frequency of trips or weekly miles traveled to eat a meal (SD)			+	+			+	+	+		+
Frequency of commute trips (SD)							-				-
Frequency of trips for work/school related activities (SD)								+		+	+
Frequency of trips for entertainment/social/recreational purposes (SD)							+		+	+	
Frequency of travel taking others where they need to go (SD)			+								
Weekly miles in a personal vehicle (SD)										+	
Travel Liking											
Personal vehicle (SD)						-	-		-	-	
Walking/jogging/cycling (SD)						+					
Bus (SD)	+									-	
Trips to eat a meal (SD)										-	
Entertainment/recreational/social (SD)				+							
Personal vehicle (LD)								-		+	-
Work/school-related (LD)			+					+			+
Overall travel (LD)								-			
Attitudes											
Travel stress factor score				-			-		-		-
Commute benefit factor score							-		-		-
Pro-environmental solutions factor score					-						
Travel freedom factor score					+						

DEPENDENT VARIABLE ➔	SHORT DISTANCE						LONG DISTANCE				
	Total	Commute	Work/School	Entertainment	Personal Vehicle	Walk/Jog/Cycle	Total	Work/School	Entertainment	Personal Vehicle	Airplane
Pro-high density factor score											+
Feel attached to neighborhood				+							
Lifestyle											
Frustrated factor score				-			-		-	-	-
Workaholic factor score			+						-		
Family & community-oriented factor score						-					
Status seeking factor score							-				
Personality											
Adventure seeker factor score	+		+	+	+	+	+	+			+
Organizer factor score								+			
Excess Travel											
Excess Travel indicator				+		+	+	+	+	+	
Mobility Constraints											
Percent of time a vehicle is available	+			+	+	-				+	
Limitations on flying							-		-		
Demographics											
Respondent has a driver's license							+		+		
Number of others in HH with driver's license							+				
Female	-	-						-	+		+
Age category		-		-							-
Personal income category	+	+	+	+	+		+	+	+		+
Number of personal vehicles in the HH					+						
Number of people in the household			+	-			-				
Number of people 6-15 years old in HH											-
Dummy for Concord						-	-		-	+	-
Dummy for Pleasant Hill				+		-	-		-		
Suburban	+	+			+						

Note: Shaded rows indicate variables that appear in at least half the models in either the short-distance or long-distance category.

Source: Redmond and Mokhtarian (2001b).

Table 6: Impacts of Selected Subjective Variables on Objective Mobility

When the corresponding **Travel Liking** variable is ➔ the dependent variable ↓ is:	1	2	3	4	5	% change from 3 to 4
SD Entertainment	7.48	8.80	10.32	12.07	14.10	17.03
SD Walk/Jog/Cycle	1.06	2.15	3.81	6.36	10.25	66.72
LD Work/School-Related	11.40	28.69	70.13	169.40	407.21	141.55
LD Personal Vehicle	83.24	132.67	211.10	335.55	533.02	58.95
When the **Travel Stress** factor is ➔ the dependent variable ↓ is:	-2	-1	0	1	2	% change from 0 to 1
SD Entertainment	14.82	12.97	11.33	9.89	8.61	-12.75
LD Total	6227.27	5034.89	4070.78	3291.25	2660.95	-19.15
LD Entertainment	3424.21	2482.34	1799.46	1304.37	945.42	-27.51
LD Airplane	1708.53	1310.99	1005.89	771.74	592.04	-23.28
When the **Adventure Seeker** factor is ➔ the dependent variable ↓ is:	-2	-1	0	1	2	% change from 0 to 1
SD Total	128.41	145.34	164.49	186.14	210.62	13.16
SD Work/School-Related	3.02	3.70	4.50	5.44	6.53	20.79
SD Entertainment	8.40	9.72	11.24	12.97	14.94	15.38
SD Personal Vehicle	73.80	85.42	98.84	114.34	132.25	15.69
SD Walk/Jog/Cycle	4.17	4.79	5.49	6.26	7.14	14.22
LD Total	2534.94	3191.24	4017.41	5057.38	6366.50	25.89
LD Work/School-Related	15.18	29.20	55.38	104.25	195.47	88.24
LD Airplane	449.65	665.13	983.64	1454.45	2150.37	47.86
When the **Excess Travel indicator** is ➔ the dependent variable ↓ is:	0	4	8	12	16	% change from 0 to 8
SD Entertainment	9.40	10.33	11.34	12.44	13.64	20.67
SD Walk/Jog/Cycle	3.98	4.71	5.53	6.48	7.57	39.00
LD Total	2535.99	3215.85	4077.88	5170.92	6556.86	60.80
LD Work/School-Related	36.18	45.64	57.52	72.42	91.11	58.99
LD Entertainment	879.54	1259.78	1804.21	2583.75	3699.91	105.13
LD Personal Vehicle	138.41	186.18	250.31	336.43	452.06	80.85

Notes: The entries in each cell are the approximate raw miles predicted from our Objective Mobility models, with all explanatory variables except the noted one evaluated at the sample means. SD = Short Distance; dependent variable units are miles/week. LD = Long-Distance; dependent variable units are miles/year.

Source: Redmond and Mokhtarian (2001b).