Draft Proposal

Designing Vehicle Retirement and Replacement Incentives for Low-Income Households

Principal Investigators:

George M. DeShazo

Evelyn A. Blumenberg

Paul M. Ong

Prepared for:

State of California Air Resources Board

Research Division

PO Box 2815

Sacramento, CA 95812

Prepared by:

University of California – Los Angeles

3323 Public Affairs Building

Los Angeles, CA 90095

310-267-5435

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Animal subjects_____

Human subjects_____**X**_____

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1. Abstract

Several challenges persist in encouraging low-income households to adopt low- and zero-emission vehicles in California. Lower income households are more likely to own higher emitting vehicles, to hold on to these vehicles longer, and to then bear a disproportionate burden of transportation-related air pollution when compared to higher income households. Yet while low-income households have participated in the retirement rebate element of the Enhanced Fleet Modernization Program (EFMP), few of these participants choose to take advantage of the replacement rebate for lower-emitting vehicles. Additionally, very few low-income households appear to apply for the Clean Vehicle Rebate Project (CVRP) rebates offered for zero-emissions plug-in electric vehicles. Finally, the presence of car-sharing, ride-sharing and other mode-shifting programs that utilize low- or zero- emitting vehicles in low-income neighborhoods is currently extremely limited.

For low-income households, our research objective is to identify effective policy strategies that i) use incentives to promote retirement of functional, high-emitting vehicles; ii) use incentives (and possibly financing programs) to increase adoption of advanced clean vehicles; iii) assess alternative forms of incentives that would increase the use of alternative modes of travel such as car sharing, ride-sharing and public transit among low-income households.

We accomplish these objectives by deepening our understanding of i) the barriers low-income households face to vehicle retirement and replacement, ii) the decision-making processes governing their fleet management choices and iii) the attractiveness of specific types and levels of policy incentives. First, we will conduct focus groups involving participants in the vehicle retirement portion of EFMP who currently live within the Central Valley and South Coast Air District to help identify the obstacles associated with vehicle replacement. Second, using this qualitative data, we will design and administer a survey to a representative sample of low-income households in California in order to understand i) the effectiveness of alternative incentive designs, and ii) the role that enhanced financing options might play in increasing the purchase of various kinds of used and new low- and zero-emissions vehicles. Third, to better understand the factors that determine low-income households' actual retirement and replacement patterns, we propose using DMV data to track these patterns at both the census tract and possibly at the household level.

2. Introduction

The California Air Resources Board (ARB) has been providing incentives to California consumers to encourage them to retire old, high-emitting vehicles and to support the uptake of new, low- and zero-emission vehicles, through the Enhanced Fleet Modernization Program (EFMP) and the Clean Vehicle Rebate Project (CVRP). With respect to low-income households, several challenges have arisen around these two programs. First, while the retirement rebate element of the EFMP has induced participation, few of these participants choose to take advantage of the replacement rebate for lower emitting vehicles (Air Resources Board, 2013). Second, very few low-income households apply for the CVRP rebates offered for zero-emissions plug-in electric vehicles (California Center for Sustainable Research, 2014). Third, the presence of car-sharing, ride-sharing and other mode-shifting programs that utilize low- or zero- emitting vehicles in low-income neighborhoods is currently extremely limited. The recent passage of SB 459 and SB 1275 has heightened the importance of both understanding the causes of this lack of participation and using that understanding to design new policies that engage low-income households in new low- and zero-emissions vehicle programs.

Enhancing the effectiveness of these vehicle retirement and replacement programs is important for several overarching reasons. First, low-income and minority households tend to cluster in high-poverty neighborhoods (Bishaw, 2011) where they are exposed to greater environmental hazards from transportation infrastructure when compared to higher-income neighborhoods (Schweitzer and Valenzuela, 2004). They are also more likely than higher-income households to live in high-traffic neighborhoods, adjacent to busy freeways where they are exposed to much higher levels of particulate matter than other residents (Sadd et al., 1999; Schweitzer and Zhao, 2010; Houston et al., 2004). Finally, in addition to having difficulty passing smog inspections, older vehicles also have other mechanical problems that make them unreliable. A growing body of scholarship suggests a positive relationship between automobile access and the employment outcomes of the poor (Blumenberg and Pierce, 2014; Gurley and Bruce, 2005; Ong, 2002).

Therefore, a reduction in the number of high-polluting vehicles can contribute to improvements in air quality, especially when targeting the neighborhoods where these improvements are needed most. Moreover, the replacement of older vehicles with newer, cleaner vehicles may also have the concomitant benefit of enhancing the economic well-being of low-income families.

The following proposal evaluates strategies to improve participation in the EFMP and CVRP, and generate the environmental and economic benefits these programs were intended to produce. The three submitting principal investigators' respective fields of expertise augment to identify the problems associated with these programs and demonstrate the solutions required to achieve the goals explicitly laid out by SB 459 and SB 1275, as well as by ARB's mission statement. Professor Evelyn Blumenberg's research focusing on auto ownership and use among low-income households provides the general plane by which the proposed research will be analyzed. Professor Paul Ong's academic work has focused significantly on minority vehicle ownership and use and analysis of low income households' access to credit, resulting in a firm understanding of the target population and their travel and financial behaviors. Professor J.R. DeShazo's expertise with survey design and implementation and large statistical data analysis projects will be utilized for the centerpiece of the proposal: a statewide survey of low-income households. His familiarity with advanced and low emission vehicles will also provide insight into rebate design and vehicle preferences (Deshazo et al., 2014).

3. Research Objectives

The objective of our proposed research is to identify effective policy strategies that:

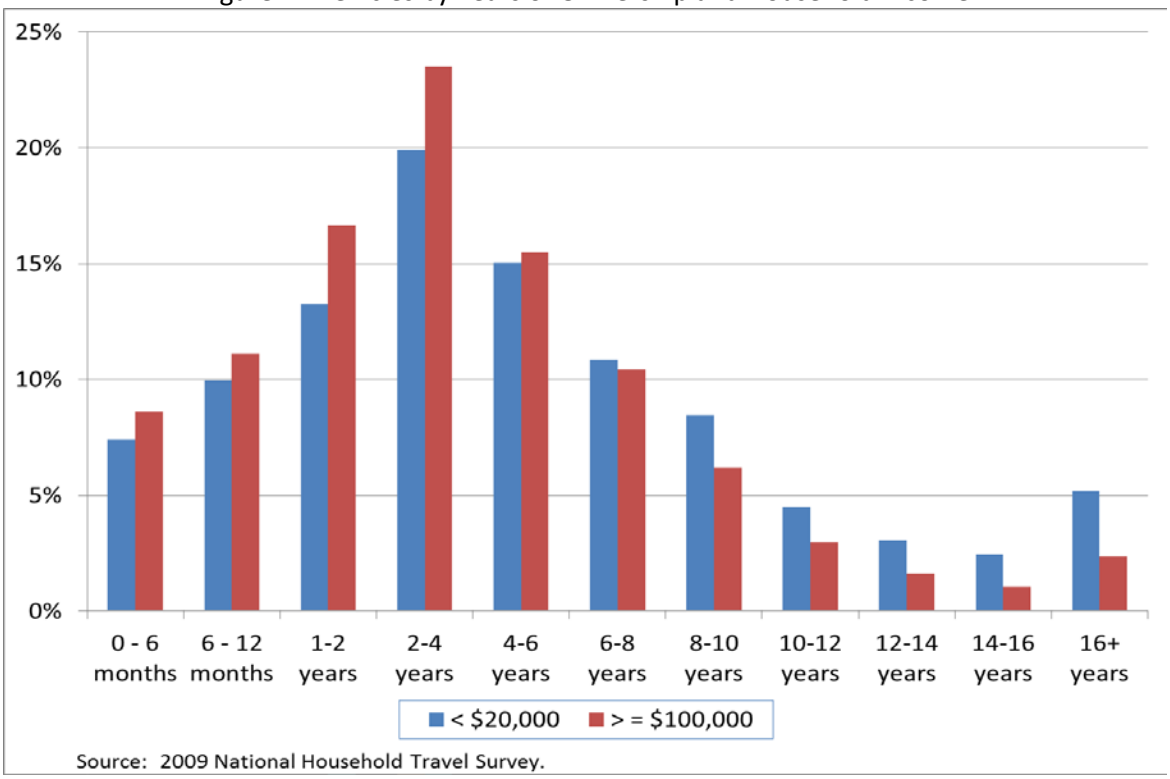
i. Use incentives to promote retirement of functional, high-emitting vehicles;
ii. Use incentives (and possibly financing programs) to increase adoption of advanced clean vehicles;
iii. Assess alternative forms of incentives that would increase the use of alternative modes of travel such as car sharing, ride-sharing and public transit among low-income households; and
iv. Identify the most cost-effective methods for increasing participation in these types of programs.

3.1 The Role of Income in a Household's Fleet Management Decisions

Despite claims to the contrary, most low-income households own and use automobiles. For example, data from the 2013 American Community Survey show that 85 percent of households below the poverty line in California have at least one automobile in their household. Additionally, seventy-two percent of workers in poor California households commute by automobile. As we discuss below, low-income households are more likely than higher-income households to own old, high-polluting vehicles, prompting policies to encourage their retirement and replacement with near-zero and zero-emission replacements. Despite the prevalence of automobiles among the poor, relatively little research examines how low-income households acquire and manage their household vehicle fleets.

Income influences several aspects of household fleet management. It determines whether (Jong et al., 2004) and how many vehicles are in a household (Fang, 2008). It also influences vehicle type and the ways in which households manage their vehicle fleets. First, low-income households are more likely to purchase used vehicles than higher-income households. Among households in the bottom income quintile, the purchase of used vehicles comprises approximately 62 percent of net outlays compared to 38 percent of net outlays among households in the top income quintile (U.S Bureau of Labor Statistics, 2011). Income is also associated with the purchase of certain types of vehicles. Low-income families tend to purchase large, likely “second-hand” vehicles (Bhat et al., 2009; Choo and Mokhtarian, 2004). Finally, data from the National Household Travel Survey (NHTS) show that lower-income households tend to own their vehicles longer than higher-income households who have the resources to replace aging automobiles (Figure 1).

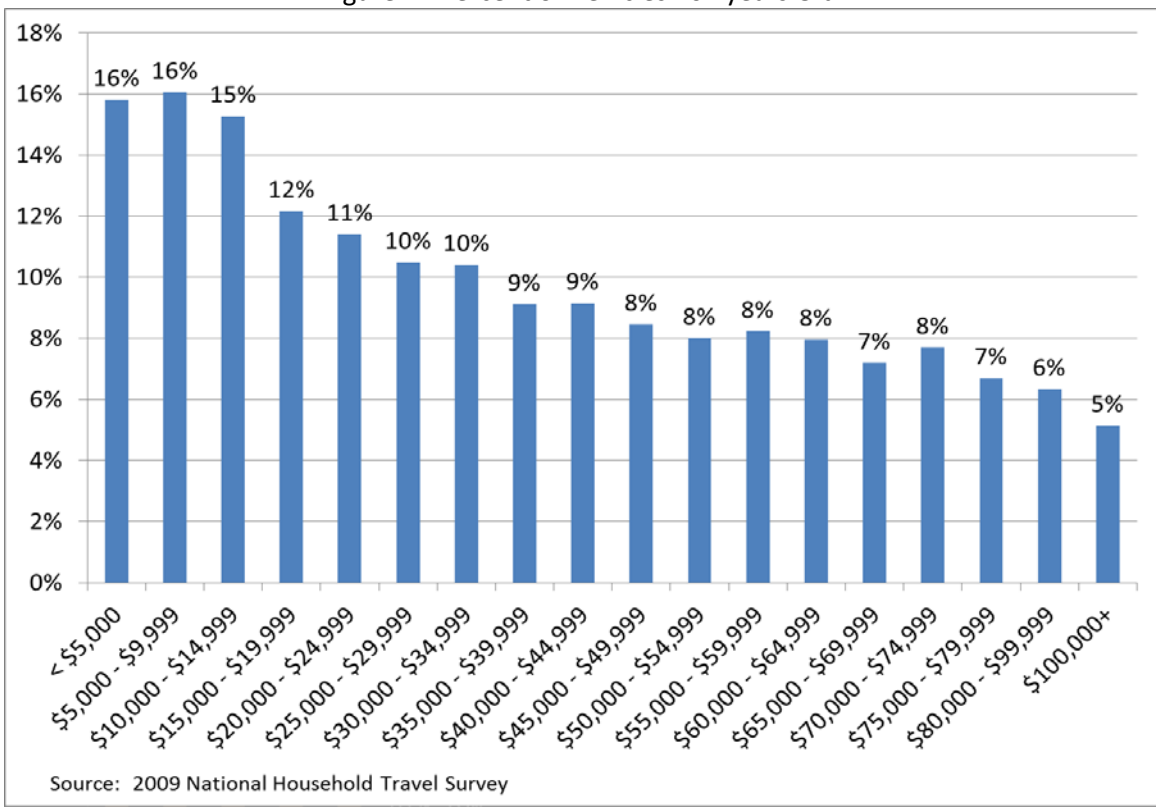
Figure 1. Vehicles by Years of Ownership and Household Income



Low-income households are more likely to drive older vehicles than higher-income households. As Figure 2 shows, in 2009 more than 15 percent of households with incomes below $15,000 owned vehicles that were 20 years or older, compared to only five percent among households with incomes above $100,000. Emissions not only tend to be higher in older vehicles, but also are also more likely to fail smog checks and be gross polluters (Choo et al., 2007). While new vehicles have benefitted from the steady improvements in pollution control equipment, including the development of near-zero and zero-emission vehicles, older car vehicles' pollution control equipment deteriorates over time, once again contributing to higher levels of emissions.[1]

[1] Low-income households own fewer automobiles and its members take fewer trips and travel fewer miles than higher-income households (Murakami and Young, 1997; Santos et al., 2011). Therefore, their overall contribution to emissions relative to higher-income households remains uncertain.

Figure 2. Percent of Vehicles 20+ years Old



3.2 Specific Research Questions

We will accomplish the above objectives by answering several inter-related research questions. These questions will reveal vehicle retirement behaviors, vehicle acquisition decision-making processes, car-sharing, ride-sharing and other mode-shifting program preferences, and cost-effective incentive policy designs.

3.2.1 Vehicle retirement decisions

The literature on vehicle retirement or scrappage has not evaluated programmatic impacts on low-income households and neighborhoods. But several of the issues and strategies discussed are relevant for low-income household retirement decisions. The central issue of adverse selection is that while owners generally know the quality of their vehicles, those administering a scrapping program do not, and may have no choice but to pay money for vehicles which would soon be scrapped anyway. If households would have soon scrapped their vehicles regardless, then the cost effectiveness of the program may be lower because the VMT and emissions reductions will be lower for the scrapped vehicles. Thus targeting retirement incentives toward vehicles and households associated with higher future VMT or emission impacts becomes critical for improving the cost effectiveness of programs.

The evidence on the cost effectiveness of retirement programs is mixed. Knittel (2009) shows that Consumer Assistance to Recycle and Save Act (CARS) paid 4 to 10 times more per car than the social benefit of the resulting CO_2 reductions would justify. Analyzing CARS over a longer period of time, Huang (2010) uses a regression discontinuity approach to infer that an increase of $1,000 in rebates caused a 7.2 percent increase in more fuel efficient vehicles. Gayer and Parker (2013) show that same

program to have a 6 to 15 percent monthly increase in market share during various months of the program's operation.[2] Focusing on California, Sandler (2012) estimates that 80 to 90 percent of the vehicles in BAAQMD's jurisdiction that were eligible for the program had enough remaining VMT and emissions to justify the cost of retiring them when the emissions are valued according to the standard used by the program.

What these studies and related simulation studies[3] highlight is the importance of targeting "desirable" vehicles and households with the retirement policy. These are vehicles and households who, in the absence of the retirement programs, would generate high VMT and emissions per VMT. An excellent study by Sandler (2012) reveals that targeting can increase program effectiveness. In California, he found that targeting trucks, vehicles with larger engines, and several other attributes could be effective.

Our vehicle retirement research questions are:

i. Which factors determine households' vehicle retirement decisions? What role does vehicle reliability, repair costs, fuel costs (efficiency), changes in a households travel needs, access to transit, characteristics of the vehicle, characteristics of the household including number of cars and characteristics of the neighborhood play in the retirement decision?
ii. What are the factors that explain when households choose to retire low-functioning versus high functioning high-emitting vehicles?
iii. Under what conditions does a retirement decision significantly change a household's average fuel economy for the remaining vehicle fleet? We will be evaluating the replacement vehicle or if the vehicle is not replaced, what the fuel efficiency is of the remaining vehicles that will be driven based on how household vehicles are used?
iv. How can retirement incentive programs be designed to avoid adverse selection and free-riding and promote retirement of functional, high-emitting vehicles?

3.2.2 Vehicle acquisition decisions

Low-income and minority households face a number of obstacles to purchasing automobiles. First, they face price discrimination in the form of higher purchase prices for new cars (Ayres and Siegelman, 1995). Minorities have lower levels of financial literacy and savings (Babiarz and Robb, 2014). They also face more costly and unfair financing arrangements for vehicles (Sutton, 2007; Van Alst, 2009) and have less access to financial institutions (Blanco, et al., 2015). All of these factors result in high purchase prices for used and new vehicles.

Low-income and minority households are disadvantaged by a mix of regressive auto-related operating expenses that contribute to the high cost of auto ownership. Flat fees—for driver's licenses, smog checks, and automobile registration—by their very nature comprise a higher percentage of the budgets of low-income households when compared to higher-income households. Automobile insurance rates also place a disproportionate burden on low-income households due to the widespread use of flat rates as well as redlining in low-income and high-minority neighborhoods (Ong and Stoll, 2007). Finally, low-income families have higher vehicle operating costs since they tend to drive older cars that are less fuel efficient, a problem that is particularly onerous with increased gas prices.

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[2] Related studies include Adda and Cooper (2004) who examine a French program from the late 90s, while Edmunds.com (2009), Mian and Sufi (2010), and Li, Linn, and Spiller (2011) estimate the impact of CARS.
[3] Simulation exercises include Hahn (1995), Deysher and Pickrell (1997), Szwarcfiter, Mendes, and Rovere (2005), and Kavalec and Setiawan (1997).

Low-income and minority households preferences for replacement vehicles may also be affected by more general factors such as their commuting or travel needs, their family size and their taste in vehicle styles. One additional factor that we will evaluate is whether their search processes when seeking to purchase a vehicle differs greatly across subgroups.

Our vehicle replacement research questions are:

i. What factors determine households' choice of a vehicle? How does the importance of these factors vary across different types of low-income households?
ii. In the context of demand analysis, what are households' barriers to purchasing more low and zero-emissions vehicles? Is it the price of these vehicles? Is financing a major barrier (and associated issues of credit worthiness)? Is it the household misperceptions of the fuel economy savings or appropriateness of the vehicle for their travel needs?
iii. Where and how do low-income households search for vehicles to buy? How do their search strategies affect their access to competitively priced financing, insurance and service agreements?
iv. What incentive levels and associated vehicle eligibility requirements would incent households to purchase low- and zero emission vehicles?

3.2.3 Car-sharing, ride-sharing and other mode-shifting programs

Policies to increase automobile access—rather than ownership—could provide many of the benefits of automobiles without the high out-of-pocket and environmental costs of ownership. These policies might include efforts to promote car sharing, ride sharing, and automobile leasing. However, thus far, these programs tend to attract middle- and higher-income users. There are a handful of low-income car sharing programs (Espino and Truong, 2014). However, in general, car sharing programs have had difficulty attracting qualified low-income participants and maintaining their profitability in low-income neighborhoods (Millard-Ball et al., 2005). Finally, public transit may be a reasonable substitute for driving particularly in dense urban neighborhoods where origins and destinations are proximate. Giuliano (2005) finds strong associations between transit commuting and large metropolitan areas, high-density neighborhoods, and central-city employment.

Our specific research questions are:

i. What are the household, built environment, public transit and local market factors that determine low-income households' use of car-sharing, ride-sharing and other mode-shifting programs (e.g., public transit) that might utilize low- or zero- emitting vehicles?
ii. What are the barriers? What types of policies would address these barriers and increase usage?

3.2.4 Cost-effective incentive policy designs

When designing incentive programs, research generally agrees that policymakers should design incentives programs that 1) are as salient as possible to consumers during choice occasions, 2) reduce free riding effects (e.g., minimizing the allocation of incentives to households with high probabilities of purchasing a low- or zero emissions vehicle anyway), 3) target households with a relatively higher marginal utilities for income (targeting poorer relative to wealthier households) and 4) reduce adverse selection effects (e.g., retiring vehicles that will be driven relatively fewer miles). The better these

policies perform along these dimensions, the more cost effective they are likely to be, giving the ARB a bigger bang (social benefit) for each dollar spent.

Consumers appear to respond differently to financial incentives of different types, but which convey the same net value to consumers (Chetty, Looney, and Kroft, 2009). Researchers have shown that consumers respond more to rebates and sales tax exemptions that occur nearer to the point of sale than to income tax incentives, which must be applied for and received at some later point in time. Gallagher, Sims, and Muehlegger (2011) provide an example for cleaner vehicle technologies when they report that Hybrid Electric Vehicle sales increase more in response to sales tax exemptions than to income tax credits/exceptions.

DeShazo et al. (2014) have shown that understanding households' i) value (e.g., demand or willingness to pay) for different types of vehicles and ii) marginal utility of income can aid policymakers in designing incentive structures that minimize free riding and maximize additional vehicles sold. For plug-in electric vehicles, they show that a policymaker's optimal vehicle decreases as a household's value for that vehicle increases. (This is because household segments with high ex ante values for the product are more likely to purchase the product under any policy, thus qualifying in greater numbers for the rebate than are consumer segments with lower ex ante product values. As a result, targeting consumers with lower ex ante values for vehicles is more cost-effective, requiring less public rebate revenue for the same change in consumer probabilities of product switching.) Second, they show that a policymaker's optimal rebate increases as the household's own marginal utility of income increases. (Simply put, the more a household values receiving an additional dollar, the more likely a dollar rebate is to be effective in incenting a vehicle purchase.)

Our research questions are:

i. How can ARB design these policies (target vehicles and households) to maximize the effect of each dollar spent? What are the best tiering designs for incentive levels that will best incent additional low- or zero emission vehicle adoption? Which policy designs best avoid free riding by program participants? What are the optimal vehicle eligibility criteria?
ii. What types of policy instruments (rebates, sale tax exemption, reduced fees, financing) are more effective? How might buyer's eligibility for these incentives be best structured?

4. Technical Plan

Our technical plan will consist of 7 major tasks:

1. Project management
2. Conduct retirement EFMP participant focus groups in the Central Valley and South Coast
3. Low-income households survey design, pretesting and administration
4. Statistical modeling of survey responses
5. Analysis of low-income house fleet management and replacement decisions
6. Draft report preparation and continued analysis
7. Report revision and finalization

4.1 Task 1: Project Management

Project management consists of two major "external" subtasks described below: meetings with ARB staff and reporting and invoicing. Additionally, project management includes the more procedural/coordination aspects of the "internal" supervision of the UCLA team (data specialist, undergraduate researcher, and administration) and weekly meetings with one or more members of the UCLA team.

4.1.1 Meetings with ARB

Project start-up will begin with an in-person meeting between project investigators and ARB staff in Sacramento, to be completed within the first two weeks of the project.

Thereafter, regular meetings are planned with ARB approximately 1 month after submission of quarterly reports (described below and detailed in Section 6). It is proposed that most meetings are via telecommunications, with in-person meetings proposed for project initiation, annual review, discussion of the draft report, and project finalization (e.g., for a Chairman's Technical Seminar if desired). Travel is budgeted for each of these trips.

4.1.2 Reporting and invoicing

Quarterly progress reports will be submitted within 2 weeks of the end of each quarter. Quarterly invoicing will accompany all reports.

Quarterly reports will: review the work conducted and describe any problems encountered during the reporting quarter; discuss the work to be conducted in the next quarterly period; and present the funds expended and assess the status of the project with respect to being on time and within budget.

The draft final report will be written in accordance with the ARB guidelines. This will consist of the following main components:

i. Description of the objective and approach
ii. A summary and discussion of the data collected and estimates of precision and accuracy
iii. Discussion of the data analysis (modeling)
iv. Summary and conclusions.

The Draft Final Report will be provided to ARB staff at least 6 months before contract completion, with a goal of delivering a draft of the Draft Final Report approximately 7 months before project completion. This would allow for additional in-person discussion with ARB staff and revision before official submission of the Draft Final Report. The Final Report will address comments provided after official review of the Draft Final Report.

4.2. Task 2: Conduct retirement EFMP participant focus groups in the Central Valley and South Coast

This objective of conducting focus groups in both the Central Valley and the South Coast Districts is to obtain a variety of qualitative information as well as to focus-group test specific sections of the survey instrument before it is pretested. We first present our proposed schedule and content for the focus groups and then present two possible recruitment plans for these focus groups.

4.2.1 Structure and focal content of focus groups

Based on our current thinking, we propose the following structure and topics. We anticipate that each focus group will last approximately 90 minutes.

i. Administer short survey documenting (15 minutes)
   - Household vehicle fleets holdings
   - Recent retirement and acquisitions
   - Trip taking patterns of household members

ii. Evaluate through discussion (30 minutes)
   - Household decision making & search process for vehicle retirement & acquisition
   - The EFMP application and submission process
   - The importance of financing the decision of how much a household can pay

iii. Administer short survey evaluating (20 minutes)
   - vehicle choice exercise
   - vehicle choice exercise ***with financing*** options
   - Role that incentive structures and level would play for low and zero-emission vehicles

iv. Open-ended Discussion of survey questions and choices (25 minutes)

4.2.2 Focus group recruitment options

Below we present two recruitment plans: Plan A involves EFMP participants and requires the direct involvement of direct support from ARB. Plan B can be implemented without support from ARB.

4.2.2.1 Recruitment Plan A

UCLA would submit the focus group script to both its internal IRB and the ARB for review. Once approved, ARB would then internally randomly sample approximately 36 participants' addresses from the 2015 EFMP program who live the Central Valley and South Coast District, respectively. ARB would then mail invitations to participate in the focus group at focus group locations in the Central Valley and the South Coast for which each participant would be paid $140 for 90 minutes of their time. UCLA would receive the RSVPs while its contractor (Pacific Research, see attached letter) would make payment to respondents for participating. We expect that out of 36 invitations within each District we would receive at least 12 positive responses and participants, enabling us to conduct two focus groups with 6 participants each in both the Central Valley and the South Coast Districts.

4.2.2.2 Recruitment Plan B

If ARB is not able to assist in recruiting EFMP participants, then our subcontractor (Pacific Research, see attached letter) would recruit two focus groups of 6 low-income participants each for both the Central Valley and South Coast Districts. As with Recruitment Plan A, Plan B would also result in a total of 24 participants, four groups of 6 participants, with two groups in each District.

If our proposal is selected for funding, we anticipate discussing with ARB which of these two recruitment plans it prefers we implement.

4.3. Task 3: Low Income Households Survey Design, Pretesting and Administration

The largest and most important component of our proposed research tasks is a survey of low-income car buyers in California. The first of its kind, we would sample over 1,400 households who intend to purchase a vehicle within the next two years. Our survey will evaluate low income households demand for used and new advanced ICEs, hybrid, and plug-in (BEVs and PHEVs) technologies. The central focus on this survey would to identify more cost effective:

i. Incentives to promote retirement of functional, high-emitting vehicles through a) tiering rebate designs, b) targeting specific vehicle types and c) targeting specific types of households;
ii. Incentives to increase adoption of advanced clean vehicles through a) tiering rebate designs, b) targeting specific vehicle types and c) targeting specific types of households;
iii. Financing or credit enhancement programs that would increase low-income households purchase of advanced clean vehicles;
iv. Opportunities and incentives for trip mode shifting toward car- and ride-sharing as well as public transit that utilize advanced clean vehicles.

This survey would be developed from careful focus group work (described above in task 2) as well as field pre-testing by GFK.

4.3.1 Survey structure

We propose structuring this survey around six modules. Due to limited space, we discuss only the most notable aspects of each module.

Module 1 documents the current household fleet, travel needs and patterns, gas prices and residential housing type. This information will enable the respondent to reflect on their particular vehicle's needs and critical recurrent trips, and will enable us to estimate monthly fuel cost for the driver's current vehicle as well as their average daily commute - both of which we will use in module 3. It will also enable an assessment of the cost of providing residential charging infrastructure which will vary across types of single and multi-family housing.

Module 2 characterizes a rank-ordering of the driver's preferences over used and new vehicle attributes such as body type, make and model and brand. A distinctive feature of our approach is the elicitation of the driver's most preferred vehicle brands, makes, and models around which we develop a pivot-conjoint choice design in modules 3 and 5. The benefits of this approach are that we can control for these important attributes of the vehicle without having to vary them in latter choice modules, thus allowing for the simpler choice experience for the respondents, less omitted variable bias, and greater statistical precision on the attributes of immediate interest.

Module 3 contains the set of conjoint choice experiments that present alternative vehicle design with respect to attributes such as age of vehicle, make-model, battery and gas engine range, monthly fuel costs, and purchase price. These choice sets will control for vehicle make (body type), model, brand and the ability to charge residentially (as part of the monthly fuel costs). Importantly, this module would begin by introducing the respondent to several new attributes including but not limited to battery range, the need to recharge nightly, fuels cost that depend upon both gas and electricity prices, why prices of certain technologies may differ. The goal of this module is to generate information that will enable us to

estimate the effects of differing incentives levels (e.g., price reductions) on the purchase of an advanced clean vehicle.

Module 4 contains the conjoint choice experiment that characterizes driver's value for differing types of financing programs that might assist with an auto purchase. This module will identify how much higher the probability of purchase of advance clean vehicle is in the presence of reasonable financing opportunities and comprehensible financing education;

Module 5 will assess alternative forms of incentives that would increase the use of alternative modes of travel such as car sharing, ride-sharing and public transit among each member of the households; and

Module 6 collects information on household socio-economic variables, knowledge of the EFMP program, knowledge of electric vehicle policies and attitudes towards these vehicles.

4.3.2 Sampling methods

We will survey approximately 1,400 low income households that are used or new car buyers within California. Once we have designed the survey, we will use the highly reputable firm GfK to ensure the household sample is representative. GfK's KnowledgePanel is a probability-based panel designed to be statistically representative of the California population. Because all KnowledgePanel households were selected randomly with a known probability of selection, KnowledgePanel estimates can be used with the statistical confidence required.

Initially using random-digit-dialing (RDD), KnowledgePanel is now continuously maintained using the United States Postal Service's Delivery Sequence File. This file is essentially a complete list of all California residential households, including households that are cell phone-only and often missed in RDD sampling. Persons in selected households are then invited to participate in GfK's web-enabled panel. Those who agree to participate, but are not already on the Internet, are sent a laptop computer and receive an Internet service connection provided and paid for by GfK. People who already have computers and Internet service are permitted to participate using their own equipment. Once on KnowledgePanel, panelists receive unique log-in information for accessing surveys online and are sent emails three to four times a month inviting them to participate in research projects.

4.3.2.1 Latino Subsample

The sample for KnowledgePanel Latinos uses a dual frame design. The main sample is recruited through the mail using English and Spanish materials. This address-based sample (ABS) is drawn from the U.S. Postal Service's Computerized Delivery Sequence file that covers approximately 97% of the physical addresses. The ABS mail sample represents all households whether they have only cellular telephone service, a landline telephone or no telephone service. The ABS sample is further supplemented with a smaller RDD telephone recruitment that specifically targets high density Latino areas. This RDD sample is designed to exclusively recruit additional Spanish-dominant households. As a result, KnowledgePanel Latino has the most complete coverage of the California Latino population.

4.4 Task 4: Statistical Modeling of Survey Responses

In order to evaluate the effects of a variety of retirement and rebate designs, we first develop and estimate an innovative empirical model of consumer vehicle choice. The centerpiece of our empirical analysis is a consumer vehicle choice model that enables us to model the consumer choices across all

makes and models currently in the California market. A statewide representative survey of low income car buyers in California enables us to identify individual preferences for conventional and alternative vehicle technology attributes, allowing us to estimate price elasticities of demand and willingness to pay for different vehicles. We integrate this data on vehicle sales and market structure to predict the effect of alternative rebate policy designs on our policy performance metrics.

The basic elements of the analysis require that the researchers have estimates of 1) the price elasticities of demand for the relevant dimension of consumer heterogeneity (i.e., income classes in our case), 2) the distributions of consumers' willingness to pay for each vehicle, and 3) prices for vehicles. The researcher can then explore through demand simulations how the assignments of financial incentives across products, consumer segments, and priced products will affect the number of total additional vehicles purchased, the total cost of policy (e.g., required public revenues) and the cost effectiveness per additional product purchased. We also illustrate, for those interested, the use of a simple metric for comparing allocative equity across policy designs.

We then use this estimated conditional logit model to simulate the performance of rebate designs. Our initial simulation of alternative policy designs explores the effects of changing rebate levels across advanced ICEs, hybrids, and plug-in vehicle technologies (BEVs and PHEVs). Our second set of analyses explores the effects of vehicle price caps. A vehicle price cap policy excludes adopters from a rebate who have relatively higher values for the targeted vehicle as expressed by their willingness to pay more for it. Our third set of analyses evaluates redesigning the existing rebate program to give consumers in lower-income classes relatively higher rebates. Rebate policy designs that are progressive with respect to income reduce the number of consumers who received rebates, but whom would have purchased the advanced vehicle anyway. These policies also target lower-income consumers who have a higher marginal value for the rebate and who are less likely to purchase an advanced clean vehicle except in the presence of higher rebate levels.

4.4.1 Accommodating difference in demand by type of households

We propose employing a latent class model, which allows us to group respondents into different preference classes based on individual characteristics and attitudinal responses. This model is best conceptualized as having two parts – the choice model and the class membership model. The random utility portion is a discrete choice model in which respondents choose one of the vehicles offered in our choice experiment. This portion of the model describes consumers' willingness to trade-off various attributes against one another. The latent class portion of the model allows for preference heterogeneity across the population. The model assumes there are C preference groups (classes) where the number of groups is unknown. Each group has its own set of random utilities with its own parameters. Class membership for each person is unknown. The model assumes each person has some positive probability of membership in each preference group and assigns people probabilistically to each group as a function of individual characteristics. The number of groups is determined statistically. The latent class model then captures preference heterogeneity by allowing different preference orderings over the vehicles, with some classes having a greater propensity for buying alternative fuels than others.

4.5 Task 5: Analysis of Low-income House Fleet management and replacement decisions using DMV Data

Understanding the current patterns of vehicle holdings, retirement and replacement among low-income households will enable us to better:

i. Understand current trends in VMT, fuel economy, and emissions among this population,
ii. Identify baseline and trend differences for different types of households and neighborhoods,
iii. Target retirement and replacement programs toward those vehicles, households and perhaps even geographic areas that yield the greatest emissions reductions,
iv. More accurately assess the effectiveness of current and future EFMP program components over the status quo and more validly assess their cost effectiveness.

We propose using DMV data to evaluate:

i. Trends in average vehicle fleet fuel economy, VMT and emissions, and
ii. The effects of vehicle retirements and acquisition on trends in average vehicle fleet fuel economy, VMT and emissions.

Depending upon the extent of DMV data access that we can secure, we propose one of two approaches to analyzing this data.

4.5.1 Plan A: Household-Address Matching and Analyses

If we can work with ARB to address confidentiality concerns, we would evaluate over the last 5 to 10 years household patterns of vehicle retirement and acquisition for a sample of low-income households in the Central Valley and the South Coast Districts. The basic idea is to match DMV annual records for sample households each year to observe and analyze household fleet changes year-over-year. This analysis would describe what types of households and what types of fleet management decisions had the greatest actual impact on changes in low-income household emissions, fuel economy and advance clean vehicle purchases.

4.5.2 Plan B: Census tract-level Analyses

If it is infeasible to obtain anonymous households matched records, we propose performing a similar exercise but aggregated to the census tract level. While we could not observe and evaluate specific household choices, we would be able to describe how rates of specific vehicle retirements and acquisitions affect census tract wide estimates of emissions, fuel economy and advance clean vehicle purchases.

5. Key Related References

Adda, Jerome, and Russell Cooper (2004). "An Analysis of the Effects of French Vehicle Inspection Program and Grant for Scrappage on Household Transactions." Transportation Research Part B 38 (10): 905–26.

Ayres, Ian and Peter Siegelman (1995). "Race and gender discrimination in bargaining for a new car", *The American Economic Review*, 85(3): 304-321.

Bhat, Chandra R., Sudeshna Sen, and Naveen Eluru (2009). "The impact of demographics, built environment attributes, vehicle characteristics, and gasoline prices on household vehicle holdings and use," *Transportation Research Part* B 43: 1–18.

Bishaw, Alemayehu (2011). *Areas with Concentrated Poverty: 2006–2010.* American Community Survey Briefs. U.S. Department of Commerce. Economics and Statistics Administration. Washington, DC: U.S. Census Bureau.

Blanco, Luisa R., Maria Ponce, Arturo Gongora , O. Kenrik Duru (2015). "A Qualitative Analysis of the Use of Financial Services and Saving Behavior Among Older African Americans and Latinos in the Los Angeles Area". Sage Open, DOI: 10.1177/2158244014562388.

Blumenberg, Evelyn and Gregory Pierce (2014). "A driving factor in mobility? Transportation's role in connecting subsidized housing and employment outcomes in the Moving to Opportunity (MTO) Program," Journal of the American Planning Association, 80(1): 52-66.

California Air Resources Board (2013). "Enhanced Fleet Modernization Program Assessment". Staff Report. Accessed February 25, 2015 from <http://www.arb.ca.gov/msprog/aqip/EFMP_Update_Staff_Report_November_2013.pdf>.

California Center for Sustainable Research (2014). "What Drives California's Plug-in Electric Vehicle Owners? California Plug-in Electric Vehicle Driver Survey Results". Conducted May 2013. Accessed February 25, 2015 from <https://energycenter.org/sites/default/files/docs/ nav/ transportation/cvrp/survey- results/California_PEV_Owner_Survey_3.pdf>

Chetty, Raj, Adam Looney, and Kory Kroft (2009), "Salience and Taxation: Theory and Evidence," American Economic Review, 99(4), 1145-1177.

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 Part A*, 38: 201–222.

Choo, Sangho, Kevan Shafizdeh, and Deb Niemeier (2007). "The development of a prescreening model to identify failed and gross polluting vehicles," *Transportation Research Part D* 12: 208–218.

De Jong, Gerard, James Fox, Andrew Daly, Marits Pieters, and Remko Smit (2004). "Comparison of car ownership models," *Transport Reviews*, 24:4, 379-408.

DeShazo, J.R., Tamara Sheldon and Richard Carson (2014). "Designing Policy Incentives for Cleaner Technologies: Lessons from California's Plug-in Electric Vehicle Rebate Program." Under review.

Deysher, Beth, and Don Pickrell (1997). "Emissions Reductions From Vehicle Retirement Programs." Transportation Research Record 1587: 121–27.

Edmunds Inc. (2009). "Cash for Clunkers Results Finally In: Taxpayers Paid $24,000 per Vehicle Sold, Reports Edmunds.com." Media release, Edmunds Inc, Santa Monica, October 28, 2009. http:// www.edmunds.com/help/about/press/159446/article.html.

Espino, Joel and Vien Truong (2015). *Electric Carsharing in Underserved Communities. Considerations for Program Success*. Berkeley: Greenlining Institute.

Fang, Hao Audrey (2008). "A discrete–continuous model of households' vehicle choice and usage, with an application to the effects of residential density," *Transportation Research Part B* 42: 736–758

Gallagher, Kelly Sims, and Erich Muehlegger (2011), "Giving green to get green? Incentives and consumer adoption of hybrid vehicle technology," Journal of Environmental Economics and Management, 61(1): 1-15.

Gayer, Ted, and Emily Parker (2013). "Cash for Clunkers: An Evaluation of the Car Allowance Rebate System". Economic Studies at Brookings, http://www.brookings.edu/research/papers/2013/10/cash-for-clunkers-evaluation-gayer.

Giuliano, Genevieve (2005). "Low income, public transit, and mobility". Journal of the Transportation Research Board, 1927: 63–70.

Gurley, Tami and Donald Bruce (2005). "The effects of car access on employment outcomes for welfare recipients," *Journal of Urban Economics*, 58(2): 250-272.

Hahn, Robert (1995). "An Economic Analysis of Scrappage." RAND Journal of Economics 26 (2): 222–42.

Houston, Douglas, June Wu, Paul Ong and Arthur M. Winer (2004). "Structural Disparities of Urban Traffic in Southern California". Journal of Urban Affairs, 26(5):565-592, 2004.

Huang, Edward (2010). "Do Public Subsidies Sell Green Cars? Evidence from the U.S. 'Cash for Clunkers' Program". Social Science Research Network, http://ssrn.com/abstract=1591323.

Kavalec, Chris, and Winardi Setiawan (1997). "An Analysis of Accelerated Vehicle Retirement Programs Using a Discrete Choice Personal Vehicle Model." Transport Policy 4 (2): 95–107.

Knittel, Christopher R (2009). "The Implied Cost of Carbon Dioxide Under the Cash for Clunkers Program."

Li, Shanjun, Joshua Linn, and Elisheba Spiller (2011). "Evaluating 'Cash for Clunkers': Program Effects on Auto Sales, Jobs, and the Environment." Resources for the Future Discussion Paper 10-39.

Mian, Atif, and Amir Sufi (2010). "The Effects of Fiscal Stimulus: Evidence from the 2009 'Cash for Clunkers' Program." National Bureau of Economic Research (NBER) Working Paper 16351.

Millard-Ball, Adam, Gail Murray, Jessica Ter Schure, Christine Fox, Jon Burkhardt (2005). Car-Sharing: Where and How It Succeeds. Transit Cooperative Research Program, Report 108. Washington, DC: Transportation Research Board.

Murakami, Elaine and Jennifer Young (1997). *Travel by Persons with Low Income*. NPTS Symposium, Betheda, MD.

Ong, Paul M. (2002). "Car ownership and welfare-to-work," *Journal of Policy Analysis and Management*, 21(2): 239-252.

Ong, Paul M. and Michael A. Stoll (2007). "Redlining or risk? A spatial analysis of auto insurance rates in Los Angeles", 26(4): 811-830, Autumn (Fall).

Sadd, James L., James L., Manuel Pastor, Jr., J. Thomas Boer, and Lori D. Snyder (1999). "Every breath you take... ": The demographics of toxic air releases in Southern California," *Economic Development Quarterly*, 13(2): 107-123.

Sandler, Ryan (2012). Clunkers or Junkers? Adverse Selection in a Vehicle Retirement Program. American Economic Journal: Economic Policy. 2012; 4 (4):253–81.

Santos, A., N. McGuckin, H.Y. Nakamoto, D. Gray, and S. Liss (2011). *Summary of Travel Trends: 2009 National Household Travel Survey*. Federal Highway Administration. Washington, DC: U.S. Department of Transportation.

Schweitzer, Lisa and Abel Valenzuela, Jr. (2004). "Environmental injustice and transportation: The claims and the evidence," *Journal of Planning Literature*, 18, 383-398.

Schweitzer, Lisa and J. Zhou (2010). "Neighborhood air quality, respiratory health, and vulnerable populations in compact and regions," *Journal of the American Planning Association*, 76(3), 363-371.

Sutton, R. (2007*). Car financing for low and moderate income consumers*. Baltimore, MD: Annie E. Casey Foundation.

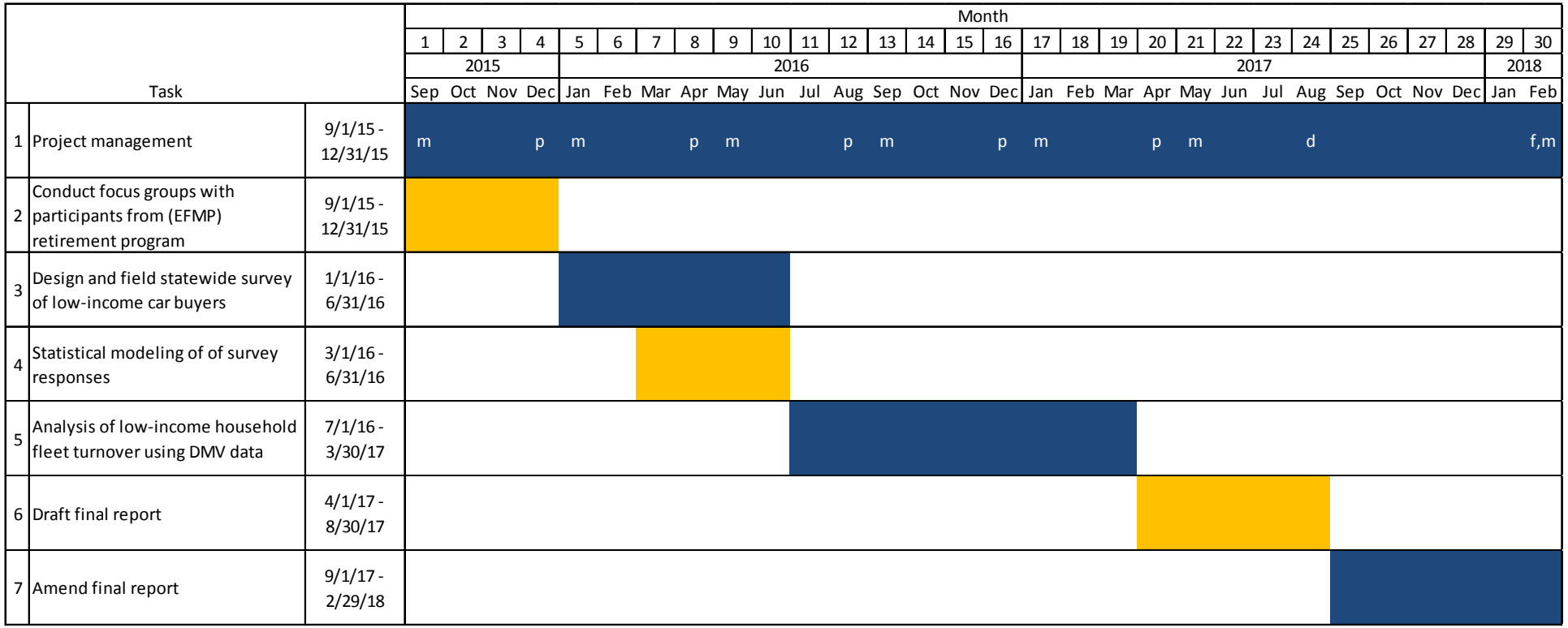
Szwarcfiter, Lila, Francisco Eduardo Mendes, and Emilio Lèbre La Rovere (2005). "Enhancing the Effects of the Brazilian Program to Reduce Atmospheric Pollutant Emissions from Vehicles." Transportation Research Part D: Transport and Environment 10 (2): 153–60.

U.S. Bureau of Labor Statistics (2011). Consumer Expenditure Survey.

U.S. Census Bureau (2013). American Community Survey.

Van Alst, J. (2009). Fueling fair practices: A road map to improved public policy for used car sales and financing. Boston, MA: National Consumer Law Center.

1 Project Schedule



p	Quarterly progress report
m	Meeting with ARB staff
d	Deliver draft report
f	Deliver final report

2 Project Management Plan

2.1 Key Personnel and Responsibilities (including management)

2.1.1 Co-Principal Investigators

Prof. J.R. DeShazo, PhD
Professor DeShazo's expertise with survey design and implementation and large stat data analysis projects, and his familiarity with advanced and low emission vehicles is most recently highlighted by "Designing Policy Incentives for Cleaner Technologies: Lessons from California's Plug-in Electric Vehicle Rebate Program" (Deshazo et al., 2014), "How Does the Presence of HOV Lanes Affect Plug-in Electric Vehicle Adoption in California? A Generalized Propensity Score Approach" (Deshazo and Sheldon, 2014), "Anticipating Future Market Demand for BEVs and PHEVs" (DeShazo and Sheldon, 2013)and the "Southern California Plug-in Electric Vehicle Readiness Plan and Atlas" (Deshazo et al., 2012).

Professor DeShazo will actively oversee the entire project, providing management and intellectual contributions throughout. Working with the other PIs, he will contribute to the script for the EFMP participant focus groups (Task 2), the development of the low-income household survey instrument (Task 3), and the analysis strategy for the low-income house fleet management and replacement decision task (Task 5). More specifically, he will take a lead role in the statistical modeling of the survey responses (Task 4) and the analysis of low-income house fleet management and replacement decisions using the DMV data (Task 5).

Prof. Evelyn Blumenberg, PhD
Professor Blumenberg's accomplished research focusing on auto ownership and use among low-income households in general is supported most recently by *Driving to Opportunity: Understanding the Links Among Transportation Access, Residential Outcomes, and Economic Opportunity for Housing Voucher Recipients* (Blumenberg et al., 2014) and "Automobile Ownership and Travel of the Poor: Evidence from the 2009 National Household Travel Survey" (Blumenberg, Evelyn and Gregory Pierce, 2012).

Professor Blumenberg will contribute to all major research tasks and to the development of related future publications. She will specifically contribute to the script for the EFMP participant focus groups (Task 2), the development of the low-income household survey instrument (Task 3), and the analysis strategy for the low-income house fleet management and replacement decision task (Task 5).

Prof. Paul Ong, PhD
Professor Ong's research experience has focused significantly on minority vehicle ownership and use, and analysis of low income households' access to credit. This is support by "Travel Patterns Among Welfare Recipients" (Ong, Paul and Douglas Houston, 2002) and "Redlining or Risk: A Spatial Analysis of Auto Insurance Rates in Los Angeles" (Ong, Paul and Michael Stoll, 2007).

Professor Ong will contribute to all major research tasks and also to the development of related future publications. As stated, along with the other PIs, he will contribute to the script for the EFMP participant

focus groups (Task 2), the development of the low-income household survey instrument (Task 3), and the analysis strategy for the low-income house fleet management and replacement decision task (Task 5). Additionally, he will take a lead role in the statistical modeling of the survey responses (Task 4) and the analysis of low-income house fleet management and replacement decisions using the DMV data (Task 5).

2.1.2 Project Manager

Alex Turek
Alex Turek will be responsible for all project management duties (Task 1) and will help guide the finalization of the report (Task 6 and 7). His educational experience includes a B.A. in Business Finance from Ohio State University and an M.U.R.P. in Regional Planning from the University of California – Los Angeles. Relevant work experience includes the "Southern California Plug-in Electric Vehicle Readiness Plan and Atlas" (Deshazo et al., 2012) and additional project management experience.

2.1.3 PhD Student

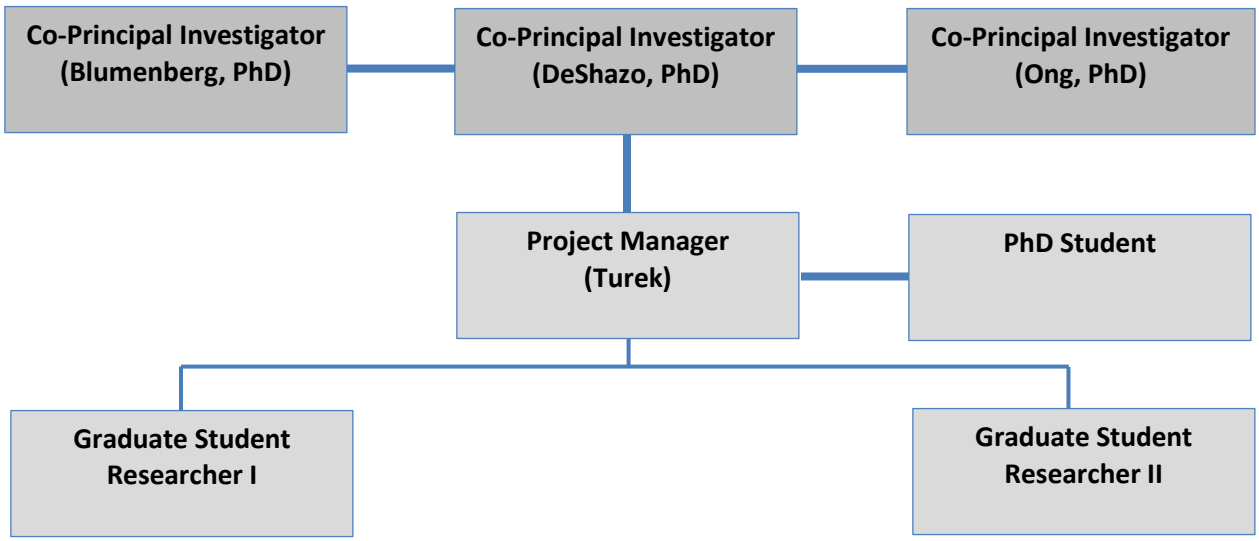
The PhD student will be responsible for the choice set design of the low-income household survey (Task 3) and for the data analysis of this survey and the low-income house fleet management and replacement decision exercise based on DMV data (Task 4 and 5).

2.1.4 Graduate Student Researchers

One graduate student researcher will be responsible for supporting the focus groups made up of participants from the retirement aspect of the EFMP program (Task 2). This researcher will also assist with the low-income household survey design and implementation (Task 3).

The second graduate student researcher will be responsible for assisting in the data analysis for the statewide low-income household survey as well as for the DMV data used to help identify low-income house fleet management and replacement decisions (Task 4 and 5).

2.2 Organizational Chart



2.3 Résumés and Publications

2.3.1 Co-Principal Investigator: J.R. DeShazo, PhD

J.R. DeShazo
Professor of Public Policy and Urban Planning
UCLA Luskin School of Public Affairs
http://innovation.luskin.ucla.edu/jr-deshazo
Phone: 310-593-1198 • Email: deshazo@ucla.edu

EDUCATION

Ph.D., Harvard University (1997) Urban Planning, Economics concentration;
Dissertation: "Essays on the Theory and Measurement of Public Goods"
M.Sc., Oxford University, St. Antony's College (1991) Development Economics, Rhodes Scholar
B.A., College of William and Mary (1989) Economics and History (Interdisciplinary) with honors

PROFESSIONAL EXPERIENCE

2012 – Present	Professor, Department of Public Policy, UCLA
2006 – 2012	Associate Professor, Department of Public Policy, UCLA
1997 – 2006	Assistant Professor, Department of Public Policy, UCLA
2000 – 2004	Faculty Associate, Harvard Institute for International Development
1993 – 2000	Urban/Environmental Economist, Harvard Institute for International Development

ADMINISTRATIVE EXPERIENCE

2009 – Present	Director, Luskin Center for Innovation, UCLA
2007 – Present	Vice-Chair, Department of Public Policy, UCLA
2006 – 2011	Director, Ralph and Goldy Lewis Center, UCLA

SELECT PUBLICATIONS AND PROJECTS

REFERRED ARTICLES – UNDER REVISION

1. "Pricing Workplace Charging: Financial Viability and Fueling Costs." B. Williams and J.R. DeShazo. *Transportation Research Board 93rd Annual Meeting*, no. 14-1137. (January 2014)
2. "Scenario Adjustment in Stated Preference Research." T.A. Cameron, J.R. DeShazo, and E.H. Johnson. Journal of Choice Modelling. (November 2010)
3. "Differential Attention to Attributes in Utility-theoretic Choice Models." T.A. Cameron and J.R. DeShazo. Journal of Choice Modelling. 3(3) 73-115 (November 2010)
4. "The Effect of Consumers' Real-world Choice Sets on Inferences from a Stated Preference Field Experiment." J.R. DeShazo, T.A. Cameron, and M. Saenz. *Environmental and Resource Economics.* 42(3):319-343 (2009)
5. "Evaluation Reforms in the Implementation of Hazardous Waste Policies in California." W.B.

Cutter and J.R. DeShazo. *California Policy Options.* (2006)

6. "Frontiers in Stated Preferences Methods: An Introduction." V. Adamowicz and J.R. DeShazo. *Environmental and Resource Economics.* 34(1): 1-6 (2006)
7. "Designing Choice Sets for Stated Preference Methods: The Effects of Complexity on Choice Consistency." J.R. DeShazo and G. Fermo. *Journal of Environmental Economics and Management.* 43(3): 360-385 (2002) (Paper identified as one of the three of the most influential articles of the year at the 2002 World Congress of Environmental and Resource Economics by Ian Bateman, Editor of *Environmental and Resource Economics*.)

NON-PEER REVIEWED ARTICLES AND BOOK CHAPTERS

8. "Designing Policy Incentives for Cleaner Technologies: Lessons from California's Plug-in Electric Vehicle Rebate Program." J.R. DeShazo, T. Sheldon, and R. Carson. (October 2014)
9. "Pricing Plug-in Electric Vehicle Recharging in Multi-Unit Dwellings: Financial Viability and Fueling Costs," B. Williams and J.R. DeShazo. UCLA Luskin Center for Innovation Report. (2013)
10. "Southern California Plug-in Electric Vehicle Readiness Plan." J.R. DeShazo and A. Ben-Yehuda. UCLA Luskin Center for Innovation Report for Southern California Association of Governments. (2012)

RESEARCH GRANTS AND CONTRACTS

Principal Investigator. 2014. California Environmental Protection Agency and the Office of Environmental Health Hazard Assessment,"Evaluating Benefits in Disadvantaged Communities for Implementation of the Greenhouse Gas Reduction Fund."

Co-Principal Investigator. 2013-2015. California Air Resources Board. "Examining Factors that Influence ZEV Sales in California."

Principal Investigator. 2012-2014. California Air Resources Board. "Analyzing the Economic Benefits and Costs of Smart Growth Strategies."

Principal Investigator. 2012-2013. Southern California Association of Governments. "Plug-In Electric Vehicle Readiness Plan."

Co-Principal Investigator. 2011-2012. UC Institute of Transportation Studies. "Planning for Electric Vehicle Growth."

Principal Investigator. 2003. California Policy Research Center. "Evaluating the Governance and Privatization of Public Bus Transit in California."

Co-Principal Investigator. 1999. National Science Foundation/US Environmental Protection Agency. "Understanding the Effects of Choice Set Complexity in Stated Preference Methods." Co-PI: Trudy Cameron.

2.3.2 Co-Principal Investigator: Evelyn Blumenberg, PhD

Evelyn Blumenberg
Department of Urban and Regional Planning
UCLA Luskin School of Public Affairs
Phone: 310-903-3305 • Email: eblumenb@ucla.edu

EDUCATION

Ph.D., University of California Los Angeles (1995) Urban Planning
M.A., University of California Los Angeles (1990) Urban Planning
B.A., University of California Berkeley (1983) Political Science with honors

PROFESSIONAL EXPERIENCE

2011 – Present	Professor, Department of Urban Planning, UCLA
2004 – 2011	Associate Professor, Department of Urban Planning, UCLA
1998 – 2004	Assistant Professor, Department of Urban Planning, UCLA
1997 – 1998	Visiting Assistant Professor, Department of Urban Planning, UCLA
1995 – 1997	University of California President's Postdoctoral Fellow, Department of Urban Planning, UCLA

SELECT PUBLICATIONS AND PROJECTS

BOOK CHAPTERS AND JOURNAL ARTICLES

1. Blumenberg, Evelyn (forthcoming). "Social Equity and Urban Transportation," *The Geography of Urban Transportation*, 4th Edition, eds. Susan Hanson and Genevieve Giuliano. New York: The Guilford Press.
2. Blumenberg, Evelyn and Trevor Thomas (forthcoming). "Travel Behavior of the Poor Post-Welfare Reform," *Journal of the Transportation Research Board*.
3. Blumenberg, Evelyn and Asha Weinstein Agrawal (2014). "Getting Around When You're Just Getting By: Transportation Survival Strategies of the Poor" *Journal of Poverty*, 18: 355-378.
4. Blumenberg, Evelyn and Gregory Pierce (2014). "A Driving Factor in Mobility? Transportation's Role in Connecting Subsidized Housing and Employment Outcomes in the Moving to Opportunity (MTO) Program," *Journal of the American Planning Association*, 80(1): 52-66.
5. Blumenberg, Evelyn and Gregory Pierce (2014). "Multimodal Travel and the Poor: Evidence from the 2009 National Household Travel Survey," *Transportation Letters*. 6(1), January.
6. Blumenberg, Evelyn and Michael Smart (2014). "Brother Can You Spare a Ride? Carpooling in Immigrant Neighborhoods," *Urban Studies*, 51(9), 1871-1890.
7. Blumenberg, Evelyn and Gregory Pierce (2012). "Automobile Ownership and Travel of the Poor: Evidence from the 2009 National Household Travel Survey," *Journal of the Transportation Research Board*, 2320: 28-36.
8. Blumenberg, Evelyn and Alexandra Elizabeth Evans (2010). "Planning for Demographic Diversity: The Case of Immigrants and Public Transit," *Journal of Public Transportation,* 13(2): 23-45.
9. Blumenberg, Evelyn and Michael Smart (2010). "Getting by With a Little Help from My Friends…and

Family: Immigrants and Carpooling," *Transportation*, 37(3): 429-446.

10. Blumenberg, Evelyn (2008). "Immigrants and Transport Barriers to Employment: The Case of Southeast Asian Welfare Recipients in California," *Transport Policy*, 15: 33-42.
11. Blumenberg, Evelyn and Lisa Schweitzer (2006, March/April). "Devolution and Transport Policy for the Working Poor: The Case of the U.S. Job Access and Reverse Commute Program," *Planning Theory and Practice*, 7(1): 7-25.
12. Blumenberg Evelyn (2004). "En-gendering Effective Planning: Spatial Mismatch, Low-Income Women, and Transportation Policy," *Journal of the American Planning Association*, 70:3: 269-281.
13. Blumenberg, Evelyn and Michael Manville (2004). "Beyond the Spatial Mismatch: Welfare Recipients and Transportation Policy," *Journal of Planning Literature*, 19(2): 182-205. *Research Record: The Journal of the Transportation Research Board,* 1859: 93-101.
14. Blumenberg, Evelyn and Kimiko Shiki (2003). "How Welfare Recipients Travel on Public Transit, and Their Accessibility to Employment Outside Large Urban Centers," *Transportation Quarterly,* Spring, 57(2): 25-37.
15. Blumenberg, Evelyn (2002). "Planning for the Transportation Needs of Welfare Participants: Institutional Challenges to Collaborative Planning," *Journal of Planning Education and Research*, 22(2): 152-163.
16. Blumenberg, Evelyn and Paul Ong (2001). "Cars, Buses, and Jobs: Welfare Recipients and Employment Access in Los Angeles," *Transportation Research Record: The Journal of the Transportation Research Board,* 1756: 22-31

BOOKS AND MONOGRAPHS

Driving to Opportunity: Understanding the Links Among Transportation Access, Residential Outcomes, and Economic Opportunity for Housing Voucher Recipients. Rolf Pendall, Christopher Hayes, Arthur (Taz) George, Zach McDade (The Urban Institute); Casey Dawkins, Jae Sik Jeon, Eli Knaap (National Center for Smart Growth, University of MD); Evelyn Blumenberg, Gregory Pierce, Michael Smart (UCLA) (2014). Washington, DC: The Urban Institute.

Getting Around When You're Just Getting By: The Travel Behavior and Transportation Expenditures of Low-Income Adults. Agrawal, Asha Weinstein, Evelyn A. Blumenberg, Sarah Abel, Gregory Pierce, and Charles N. Darrah (2011). San Jose, CA: Mineta Transportation Institute. (100 pages)

Travel Behavior of Immigrants Groups in California. Handy, Susan, Evelyn Blumenberg, Moira Donahue, Kristin Lovejoy, Caroline Rodier, Susan Shaheen, Kimiko Shiki, Lily Song, and Gil Tal (2007). Berkeley, CA: University of California Partners for Advanced Transit and Highways. September 2007.

California Transportation Needs Assessment: The Transportation Barriers and Needs of Welfare Recipients and Low-Wage Workers. Blumenberg, Evelyn, Douglas Miller, Mark Garrett, Lisa Schweitzer, Karen Kitsis, Michael Manville, and Bravishwar Mallavarapu (2003). Sacramento: California Department of Transportation. (452 pages)

The Transportation Needs of the Poor: A Study of Welfare Participants in Fresno County, California. Blumenberg, Evelyn, with Peter Haas (2002). MTI Report 01-23. San Jose, CA: Mineta Transportation Institute. (185 pages)

2.3.3 Co-Principal Investigator: Paul Ong, PhD

Paul M. Ong
UCLA Luskin School of Public Affairs and Asian American Studies
Phone: 310-614-2458• Email: pmong@ucla.edu

EDUCATION

Ph.D., University of California Berkeley (1983) Economics
M.U.P., University of Washington Seattle (1977) Urban Planning
B.S., University of California Davis (1973) Applied Behavioral Science

PROFESSIONAL EXPERIENCE

1994 – Present	Professor, Department of Urban Planning, UCLA
1990 – 1994	Associate Professor, Department of Urban Planning, UCLA
2000 – 2004	Assistant Professor, Department of Urban Planning, UCLA
1993 – 2000	Assistant Professor, Economics, UC Santa Cruz

ADMINISTRATIVE EXPERIENCE

2013 – Present	Director, Center for the Study of Inequality, UCLA
2007 – 2009	Director, AAPI Policy Multi-campus Research Program, UC System wide
1998 – 2006	Director, Lewis Center for Regional Policy Studies, UCLA
1995 – 1998	Chair, Department of Urban Planning, UCLA

SELECT PUBLICATIONS AND PROJECTS

JOURNAL ARTICLES

1. Paul Ong, “Environmental Justice and Green-Technology Adoption,” Journal of Policy Analysis and Management. Volume 31, Issue 3, pages 578–897, Summer 2012 (Peer Reviewed Research Article)
2. Paul Ong and Michael Stoll, “Redlining or Risk: A Spatial Analysis of Auto Insurance Rates in Los Angeles" Journal of Policy Analysis and Management, 26(4):811-829, Autumn 2007.
3. Paul Ong and Douglas Miller, “Spatial and Transportation Mismatch in Los Angeles,” Journal of Planning Education and Research, 25(1):43-65, 2004.
4. Daniel Baldwin Hess and Paul Ong, “Traditional Neighborhoods and Auto Ownership,” Journal of the Transportation Research Board Record, no. 1805, 2002, pp. 35-44.
5. Paul M. Ong, “Car Ownership and Welfare-to-Work,” Journal of Policy Analysis and Management, Vol. 21, No. 2, Spring 2002, pp 255-268.
6. Evelyn Blumenberg and Paul Ong, “Cars, Buses and Jobs: Welfare Recipients and Employment Access in Los Angeles, TRB Record, no. 1756, 2001, pp. 22-31.
7. Paul Ong and Evelyn Blumenberg, “Job Access, Commute, and Travel Burden Among Welfare Recipients,” Urban Studies, 35(1):77-93, 1998.
8. Paul Ong, "Work and Car Ownership Among Welfare Recipients," Social Work Research, 20(4):255-

262, December 1996.

9. Brian Taylor and Paul Ong, "Spatial Mismatch or Automobile Mismatch? An Examination of Race, Residence, and Commuting in the U.S. Metropolitan Areas," Urban Studies, 32(9):1453-1474, November 1995.

PUBLISHED PAPERS

10. Paul Ong and Douglas Houston, "Travel Patterns Among Welfare Recipients," Access, no. 21, Fall 2002, pp. 40-41.

11. Paul Ong, "The Access Almanac: Auto Insurance Redlining in the Inner City," Access, no. 21, Fall 2004, pp. 40-41.

2.3.4 Project Manager: Alex Turek

Alex K. Turek
UCLA Luskin Center for Innovation
Phone: 310-267-5435• Email: aturek@luskin.ucla.edu

EDUCATION

M.U.R.P., University of California Los Angeles (2014) Urban Planning
B.A., Ohio State University (2008) Business Finance

PROFESSIONAL EXPERIENCE

2012 – Present	Project Manager, UCLA Luskin Center for Innovation
2011 – 2012	Environmental Services Coordinator, Human Impacts Institute, New York
2011	Program Evaluator, MillionTreesNYC, New York
2009 – 2010	Policy Analyst, Common Cause, New York

SELECT PUBLICATIONS AND PROJECTS

NON-PEER REVIEWED ARTICLES

1. "Guide to Program Design Decisions for Utility-Sponsored Community Solar". J.R. DeShazo, A. Turek and M. Samulon. Project Manager. (2015)
2. "Efficiently Energizing Job Creation in Los Angeles". J.R. DeShazo, A. Turek and M. Samulon. Project Manager. (2014)
3. "South Bay Cities Plug-In Electric Vehicle Deployment Plan." J.R. DeShazo, A. Ben- Yehuda, A. Turek, et al. UCLA Luskin Center for Innovation Report for South Bay Cities Council of Governments. (2013)
4. "Southern California Plug-in Electric Vehicle Readiness Plan." J.R. DeShazo, A. Ben- Yehuda, A. Turek, et al. UCLA Luskin Center for Innovation Report for Southern California Association of Governments. (2012)

3 Estimated Cost by Task

		Labor	Employee Fringe Benefits	Travel Subsist	Subcontractors	Misc.	Overhead	**Total**
1	Project management	$13,710	$9,557	$5,000	$0	$116	$2,838	**$31,221**
2	Conduct focus groups with participants from (EFMP) retirement program	$13,031	$1,194	$0	$8,795	$98	$2,312	**$25,430**
3	Design and field statewide survey of low-income car buyers	$34,063	$1,983	$0	$80,356	$12,472	$11,664	**$140,538**
4	Statistical modeling of survey responses	$53,451	$9,905	$0	$0	$12,598	$6,371	**$82,325**
5	Analysis of low-income household fleet turnover using DMV data	$29,428	$2,167	$0	$0	$7,172	$3,177	**$41,944**
6	Draft final report	$13,524	$1,391	$0	$0	$3,572	$1,499	**$19,986**
7	Amend final report	$4,314	$899	$0	$0	$23	$524	**$5,759**
		$161,521	**$27,096**	**$5,000**	**$89,151**	**$36,051**	**$28,385**	**$347,204**

4 Letters of Support

4.1 Regents of the University of California

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OFFICE OF CONTRACT AND GRANT ADMINISTRATION
BOX 951406
11000 KINROSS AVENUE, SUITE 211
LOS ANGELES, CALIFORNIA 90095-1406

PHONE: (310) 794-0102
FAX: (310) 794-0631

www.research.ucla.edu/ocga

February 26, 2015

Annalisa Schilla
Air Resources Board

Dear Ms. Schilla:

On behalf of the Regents of the University of California, I am pleased to submit for your consideration a proposal on behalf of Dr. George "JR" DeShazo, titled "Designing Vehicle Retirement and Replacement Incentives for Low-Income Households". We request funds in the amount of $347,204 for the period of September 1, 2015 through February 29, 2018.

Please note that should a contract be issued in response to this proposal, we will be pleased to accept it based on mutually agreeable terms.

If you have any technical questions regarding this proposal, please contact Dr. DeShazo at (310) 593-1198. Please contact me with any administrative questions at (310) 794-0259 or via email at mbailey@research.ucla.edu.

Sincerely,

Miesha Bailey
Contract and Grant Officer

ecc: Professor JR DeShazo
Ms. Marsha Blum

Internal Ref. #20153606

4.2 Pacific Research

PACIFIC RESEARCH INC.

February 19, 2015

California Air Resources Board
1001 I Street P.O. Box 2815
Sacramento, CA 95812

Dear reviewer,

Pacific Research Inc. is pleased to submit a bid to the UCLA Luskin Center for Innovation on the project "Designing Vehicle Retirement and Replacement Incentives for Low-Income Households." The study will involve understanding how low-income households evaluate vehicle purchase decisions. The goal of the study is to describe the demographics of potential participants of the California Air Resource Board's Enhanced Fleet Modernization Program, and understand this population's motivations and barriers that may affect participation in the retirement and replacement program.

If the study is awarded funding, Pacific Market Research commits to recruit 4 groups to participate in this study. Two groups will host respondents from the South Coast region with the remaining two groups coming from the San Joaquin Valley – two zones designated as extreme non-attainment areas by the U.S. Environmental Protection Agency. Respondents will be current vehicle owners who plan on replacing their vehicle within the next 3 years. Respondents will be given a 30-minute survey and then participate in a 60-minute discussion period.

Cost Proposal

The table below outlines costs for the project with the goal of **24 recruits**.

Facilities	$1,200
Recruiting	$4,270
Respondent Fees	$2,800
Administration	$525
Total	$8,795

We are eager for the opportunity to support a crucial study that could help the California Air Resources Board identify policies and incentives to expand low-income household access to cleaner vehicles, thereby affording these populations cleaner and healthier air to breathe, while at the same time a quality source of transportation. We look forward to working in partnership with the UCLA Luskin Center on this important initiative.

Sincerely,

Dana Pion
Owner / Director
Pacific Research, Inc.

1046 Princeton Dr., Suite 114, Marina Del Rey CA 90292 T 310 740 8690 F. 310 740 8691

4.3 GfK Custom Research

GOVERNMENT & ACADEMIC RESEARCH PROPOSAL MEMO

TO: J.R. DeShazo, University of California, Los Angeles
FROM: Michael Lawrence
DATE: February 27, 2015
RE: GfK's Proposal to conduct the *Designing Vehicle Retirement and Replacement Incentives for Low-Income Households* for the University of California, Los Angeles

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GfK Custom Research, LLC ("GfK") is very pleased to have the opportunity to provide you with our technical and cost proposal for the project entitled ***Designing Vehicle Retirement and Replacement Incentives for Low-Income Households***. This document includes a description of our proposed technical design and a fixed-price cost estimate. In addition, a description of KnowledgePanel® methodology and our past project experience is attached.

GfK will be a subcontractor to University of California, Los Angeles in the event of a successful award. We'll be happy to answer any questions you might have, and to consult with you about the different ways KnowledgePanel can be used to further your research objectives.

Overview of KnowledgePanel®

GfK's core capability is the national online panel known as KnowledgePanel.[1] Bringing statistical projectability to online research, KnowledgePanel is the only online panel that is representative of the U.S. population, providing sampling coverage of 97% of the U.S. adult population via address-based sampling. Because every sample unit has a known selection probability, KnowledgePanel is not susceptible to the "professional respondent" problem and other hazards of "opt-in" online panels based on convenience sampling. KnowledgePanel provides the highest level of accuracy and sample representativeness available in online research for the measurement of public opinion, attitudes, and behaviors.

Because of its scientific underpinnings, KnowledgePanel is a suitable sampling platform for a broad range of economic, health, political, and social studies, as well as for policy and program evaluations. This versatility is reflected in the list of leading foundations, universities, government agencies, non-profit organizations, and prominent companies that rely on KnowledgePanel for their research projects. Consistent with our approach to sampling, the AAPOR Online Task Force, in its recent report, recommends that researchers use probability-based sampling when measuring population characteristics using online surveys.[2] Recent

[1] KnowledgePanel is the national household panel recruited initially by random digit dialing and since 2009 by address-based sampling methodology that includes non-Internet households that GfK equips with a laptop and free internet service. It totals 50,000+ individual household members age 13 and older. See the attachment and www.knowledgenetworks.com/ganp for further information on the sample representativeness of KnowledgePanel.

[2] The Online Task Force Report, 2010, of the American Association for Public Opinion Research, at www.aapor.org.

comparison research has demonstrated that KnowledgePanel's accuracy rates are comparable to high-quality random-digit dialing surveys and superior to online opt-in panels.[3]

Our Government & Academic practice has core competencies in conducting online surveys with one or more of the following design requirements:

- Longitudinal follow-up
- Tracking surveys for monitoring changes in public opinion, awareness, behaviors, and attitudes
- Surveys requiring targeted samples of specific subpopulations
- Surveys of very rare subpopulations, blending KnowledgePanel and convenience sample interviews using a statistical calibration weight based on KnowledgePanel benchmarks
- Survey instrumentation having multimedia stimuli such as videos and images
- Surveys based on contingent valuation and discrete choice methodology
- Surveys with sensitive questions that can benefit from the anonymity of self-administered, Web-based survey administration (to avoid social desirability bias)
- Creating and maintaining new custom web panels (e.g., ANES)
- Online qualitative or integrated qualitative/quantitative research

Another capability that GfK has brought to survey research is KnowledgePanel Latino[SM], which includes unassimilated Latinos and Spanish-language dominant households as well as those who were not online prior to joining our panel. This addition to our existing English-speaking Latino households provides the research community a panel of about 5,000 Latino adults that is the best statistically representative panel of Latino households in existence today. We look forward to putting these capabilities to work for you.

GfK's Technical and Cost Proposal

Project Background

The purpose of this study is to examine the auto buying decision making practices among lower income California residents. This study will be funded by a grant from the California Air Resources Board.

Key Aspects of Our Technical Proposal

GfK is exceptionally well qualified to conduct this survey for University of California, Los Angeles because KnowledgePanel is a statistically accurate sample of the U.S. population, including non-Internet households. Our proposed KnowledgePanel-based approach has several advantages:

- ***The KnowledgePanel sample for this project is statistically representative of the targeted population.*** Unlike with opt-in web panels, GfK's probability-based approach permits statistically valid inferences to be made to the U.S. population as well as sampled subpopulations. By using address-based sampling, KnowledgePanel provides sample coverage of cell phone-only households.

[3] David Yeager, Jon Krosnick et al., 2009, "Comparing the Accuracy of RDD Telephone Surveys and Internet Surveys Conducted with Probability and Non-Probability Samples."

- ***GfK can directly target its survey to respondents representing the study population.*** We will directly target one and two earner lower income households based upon Profile data.

- ***KnowledgePanel provides a cost efficient way to conduct a statistically representative survey compared to RDD telephone and many other types of surveys.***

- ***Studies conducted with KnowledgePanel are well received by the scientific community.*** Because the KnowledgePanel is based on probability sampling, studies using KnowledgePanel are built on well-known and scientifically-grounded theory of sampling. Researchers can be confident that results derived from KnowledgePanel will be accurate, reliable, and well received by the scientific peer-review community. Over 400 conference papers, journal articles, and books have featured KnowledgePanel survey data.

- ***Methodological evaluations, descriptions of KnowledgePanel design, and bibliography of GfK-based papers and publications are available in the public domain to support your funding requests, IRB reviews, Information Collection Requests, and technical appendices for publications.*** Such supporting documentation, key for scientific peer review, are available at www.knowledgenetworks.com/ganp.

- ***GfK will provide complete documentation of the survey project, including a field report, codebook, and complete description of sampling, data collection, and weighting procedures.*** This detailed documentation will be a reference source for the Client's future research papers and articles.

Sample Plan & Interview Sample Sizes for the Panel Study

The eligible study population is defined as follows: U.S., non-institutionalized adults age 18 and older, the sample drawn from among California residents. The study will be further restricted to lower-income households who are seeking to purchase a used (or new) vehicle over the next 3 years. Eligible respondents will also earn a household income level of no greater than $65,000 per year for two income earners and $38,000 for single income earner.

The survey sample will be drawn from eligible KnowledgePanel members by using an implicitly stratified systematic sample design based on the methodology for which GfK was assigned a U.S. Patent (U.S. Patent No. 7,269,570) in September 2007. The selection methodology, which has been used by GfK since 2000, ensures that KnowledgePanel samples will closely track the U.S. population and survey panelists will not be overburdened with survey requests.

If after screening we find that insufficient numbers of respondents are available on KnowledgePanel, we will utilize additional OptIn panel sources to meet the sample requirements. These data will be Calibrated and combined with KnowledgePanel responses in the final data set.

Support for Human Subjects Review

GfK will provide technical and procedural information to the Client in support of human subjects and Institutional Review Board (IRB) review. The KnowledgePanel protocol for recruitment and maintenance is fully described in a document available at this location:

http://www.knowledgenetworks.com/ganp/irbsupport/

Key staff at GfK have successfully completed training programs in the rights of human subjects (i.e., IRB training). Training certificates are available upon request.

Questionnaire Programming and Quality Assurance

GfK will program and execute the instrument provided by the Client.

Client will deliver to GfK a questionnaire in Microsoft Word with complete logic specifications, question wording, and response categories in a version that the Client warrants is finalized for questionnaire programming. The content of the Client-delivered questionnaire is expected to change no more than 10% between the version sent to GfK for programming and the final, fielded version.

GfK will format the Client-provided questionnaire with the necessary instructions to prepare the questionnaire for programming. If appropriate, GfK may ask the Client questions about logic specifications, and make recommendations for questionnaire improvements. GfK will send the GfK-formatted questionnaire back to the Client for review. The Client is required to review the GfK-formatted questionnaire and communicate to GfK in a timely manner any disagreements with GfK on GfK's interpretation of the intentions of the Client. The GfK-formatted questionnaire is the only reference document to be used for all questionnaire testing and for any changes to be made to the questionnaire after it is initially programmed. GfK will perform full testing of the programmed instrument to assure that skip logic, randomization, question wording, and all other specifications for the survey instrument match those in the Client-delivered survey instrument. After quality control testing of the programmed survey instrument has been completed, GfK will place the programmed survey instrument on a password-protected Web site setup specifically for the Client. The Client will then be able to test and complete the survey as many times as desired for testing the instrument. The survey data from this testing will not be saved. Approval by the Client will be obtained prior to fielding the actual survey.

The median interview length is assumed to be 25 minutes. Please note that this measurement of survey length includes interviews that have long duration as a result of interrupted interview sessions. For surveys with experimental designs for which it is important to have the respondent participate in the survey in one session, please consult with the GfK Project Director about the appropriate measures to incorporate into the survey invitation and instrument.

The GfK survey system accurately measures the length of survey instruments by measuring how long respondents actually spend answering the survey questions. Survey instruments with modules can be programmed for measurement of administration duration for each module. Surveys with open-ended questions can be expected to have longer survey lengths than others. As an approximate guide, usually about

2.2 closed-ended survey questions can be administered in a minute, depending upon the complexity of the survey question and the amount of reading required.

Survey Pretesting

A critical piece of the quality control program is survey pretesting. GfK will conduct a pretest of 30 interviews over a one- to three-day field period using the same survey instrument prepared for the main study. The survey pretest will be conducted online using KnowledgePanel from the study-targeted population. The pretest will be used to verify that the survey is functioning correctly and that the respondents understand the question wording and response categories, to estimate and confirm the survey incidence/eligibility rate if there is an in-field screener, to estimate the consent or cooperation rate, and to estimate the median survey length as well.

It is sometimes important to collect data on respondents' comprehension and comments on certain questions if a survey includes difficult or unfamiliar concepts or if a survey is about a sensitive topic. In those circumstances, questions to verify respondents' ability to comprehend survey questions can be administered following the relevant survey questions. Also, closed-ended or open-ended questions to collect additional comments from respondents can be administered at the end of the pretest survey instrument.

GfK will deliver to the Client all the data collected from the pretest interviews as well as the key metrics from the pretest: median survey length and incidence/eligibility rate (if there is an in-field screener). Unless otherwise noted in an agreement, the pretest interviews collected by GfK do not count toward the total number of interviews specified for the main study. If the instrument does not change between the pretest and the main survey, we will recommend that pretest respondents be combined with the Main survey respondents in the final weighted data set.

Data Collection

Once sampled for a survey, sampled KnowledgePanel members receive a personal notification email on their computer letting them know there is a new survey available for them to take. The email notification contains a button to start the survey. Alternatively, KnowledgePanel members can access the online survey by logging into their specific KnowledgePanel home page, where they will find a hyperlink to surveys for which they have been selected.

The length of the field period depends on the Client's needs and can range anywhere from a few minutes to a month or more, depending upon the survey cooperation goals of the study. We encourage our Clients to have a field period that encompasses at least one weekend. To improve response, email reminders are sent to non-responsive panel members after the third day and others are sent as needed. GfK also operates an ongoing incentive program to encourage participation and create member loyalty.

Project Management

Members of the Government & Academic Research practice will manage and conduct the research for this study. In the attached summary of GfK capabilities and past experiences, there are brief descriptions of the key staff and their respective disciplines.

Each GfK-conducted panel study is assigned to a Project Director who is responsible for the management of the study. The Project Director is responsible for working closely with the Client in all phases of the project and will be the principal point of contact with GfK for the study once the project begins.

The account executive and developer of this proposal will be monitoring the implementation of the study by the Project Director and will provide a quality assurance oversight role to ensure that the study is conducted according to the statement of work that defines our responsibilities to you, our Client. The account executive will also be available for technical consulting and to discuss with you any possible modifications to the project that need to be made once the project has begun. You, the Client, should not hesitate to contact the account executive to communicate any issues or concerns or to ask questions about our work on the study.

Staff biographies of key GfK Government & Academic Research staff are available at www.knowledgenetworks.com/ganp.

For the management of our survey projects, our Government & Academic Research practice currently has two full-time Vice Presidents, Dr. Sergei Rodkin in Palo Alto, CA, and Mr. Larry Osborn in Chicago, IL. Both are responsible for overseeing and managing complex survey projects and to supervise the work of our full-time Research Directors, Research Managers, and Research Associates. Our key VP and Senior Research Directors have more than 30 combined years in conducting GfK panel-based surveys. For addressing technical solutions to complex sampling, data collection, and weighting tasks, our VPs and RDs work closely with Dr. Mansour Fahimi, Chief Statistician.

In conducting the actual studies, the Project Director is assisted by a Research Associates who provides a second resource for the Client in the event that the Project Director is not available. The Research Associate works with GfK's Operations Department in programming the survey instrument into the Web instrument, quality control testing of the survey instrument, pretesting, sample monitoring, and preparation of all data file and report deliverables. Additionally, the Research Associate will coordinate the drawing of the survey sample by GfK's Statistics Department, perform representativeness tests on the drawn sample, and coordinate the weighting task.

The Project Director will initiate the study by conducting a kick-off teleconference with you and members of your team to review the project specifications and the project schedule and address any nuances and subtleties of the sample design, questionnaire, response rate enhancement plans, and weighting. The Project Director will then conduct an internal kick-off meeting for all the GfK project, statistics, and operations staff who will be working on the project.

Project Summary & Deliverables

GfK will deliver to the Client the following items by email:

- Programmed version of the survey instrument posted on a password-protected Web site
- A self-documented SAS or SPSS data set for all survey data (from all open-ended and close-ended questions) having complete variable and value labels:
  - In-field screener datafile
  - Main survey datafile
- General demographic profile data (listed below in the table "Standard Demographic Profile Variables") provided for all interviews
- Statistical weights incorporating the probabilities of selection and modified by post-stratification weighting based on population benchmarks from the Current Population Survey
- Field report documenting all sampling and data collection procedures, survey datafile codebook, panel recruitment methodology, and statistical weighting

Standard Demographic Profile Variables

Variable	Values	
Age	Actual age in years	
Age, 7 categories	1 = 18-24; 2 = 25-34; 3 = 35-44; 4 = 45-54; 5 = 55-64; 6 = 65-74; 7 = 75+	
Age, 4 categories	1 = 18-29; 2 = 30-44; 3 = 45-59; 4 = 60+	
Education (14 categories)	1 = No formal education	8 = 12th grade NO DIPLOMA
	2 = 1st, 2nd, 3rd, or 4th grade	9 = HIGH SCHOOL GRADUATE - high school DIPLOMA or the equivalent GED)
	3 = 5th or 6th grade	10 = Some college, no degree
	4 = 7th or 8th grade	11 = Associate degree
	5 = 9th grade	12 = Bachelors degree
	6 = 10th grade	13 = Masters degree
	7 = 11th grade	14 = Professional or Doctorate degree
Education (4 categories)	1 = Less than HS	
	2 = HS	
	3 = Some college	
	4 = Bachelors degree or higher	
Race/Ethnicity	1 = White, Non-Hispanic	
	2 = Black, Non-Hispanic	
	3 = Other, Non-Hispanic	
	4 = Hispanic	
	5 = 2+ races, Non-Hispanic	
Gender	1 = Male	
	2 = Female	
Household Head	0 = No	
	1 = Yes	
Household Size (from recruitment)	Total number of members in household	
Housing Type	1 = A one-family house detached from any other house	
	2 = A one-family house attached to one or more houses	
	3 = A building with 2 or more apartments	
	4 = A mobile home	
	5 = Boat, RV, van, etc.	

HH Income (profile and imputed)	1 = Less than $5,000	11 = $40,000 to $49,999
	2 = $5,000 to $7,499	12 = $50,000 to $59,999
	3 = $7,500 to $9,999	13 = $60,000 to $74,999
	4 = $10,000 to $12,499	14 = $75,000 to $84,999
	5 = $12,500 to $14,999	15 = $85,000 to $99,999
	6 = $15,000 to $19,999	16 = $100,000 to $124,999
	7 = $20,000 to $24,999	17 = $125,000 to $149,999
	8 = $25,000 to $29,999	18 = $150,000 to $174,999
	9 = $30,000 to $34,999	19 = $175,000 or more
	10 = $35,000 to $39,999	
Marital Status	1 = Married	
	2 = Widowed	
	3 = Divorced	
	4 = Separated	
	5 = Never married	
	6 = Living with partner	
MSA Status	0 = Non-Metro	
	1 = Core Based Statistical Area (Metro Area per U.S. Census)	
Internet access	0 = No	
	1 = Yes	
Ownership Status of Living Quarters	1 = Owned or being bought by you or someone in your household	
	2 = Rented for cash	
	3 = Occupied without payment of cash rent	
Region 4 (U.S. Census)	1 = Northeast	
	2 = Midwest	
	3 = South	
	4 = West	
Region 9 (U.S. Census)	1 = New England	
	2 = Mid-Atlantic	
	3 = East-North Central	
	4 = West-North Central	
	5 = South Atlantic	
	6 = East-South Central	
	7 = West-South Central	
	8 = Mountain	
	9 = Pacific	
State	State of residence	

Total no. of HH members age 1 or younger	Number of household members in age group
Total no. of HH members age 2 to 5	Number of household members in age group
Total no. of HH members age 6 to 12	Number of household members in age group
Total no. of HH members age 13 to 17	Number of household members in age group
Total no. of HH members age 18 or older	Number of household members in age group
Current Employment Status	1 = Working - as a paid employee 2 = Working - self-employed 3 = Not working - on temporary layoff from a job 4 = Not working - looking for work 5 = Not working - retired 6 = Not working - disabled 7 = Not working - other
Additional Data Provided for All Interviews	
Start Time	Date/Time respondent began taking survey
End Time	Date/Time respondent finished completing survey
Duration	The length of time in minutes for self-administration of the instrument for a respondent

Project Summary, Project Cost, & Payment Schedule

Project Summary

Study Name	**Designing Vehicle Retirement and Replacement Incentives for Low-Income Households**
Client Name	**University of California, Los Angeles**
Project Start Date	**To be determined**
Project End Date	**To be determined**
In-Field Screener	**Yes**
Screener Length (in minutes)	**1**
Target Population Description	**General population adults age 18 and over**
Include Spanish-Language Dominant HHs	**No**
Incidence/Eligibility Rate	**25% (estimated)**
N Main Study Interviews	**1,200 or 1,400**
Main Survey Length (in minutes)	**25**
Additional Profile Variables Beyond Standard	**NA**
Contract Amount	**$73,488.00 for n=1,200** **$80,356,00 for n=1,400** **Contract amount will rise by 5% annually if the work is not conducted in 2015**

The total fixed-price cost for this project is $73,488.00 or $80,356.00.

This is a firm fixed-price cost estimate based upon the specifications and assumptions for the project as described in this proposal. The cost estimate is valid for the next 120 days. Our costs are very sensitive to four elements: (1) the number of interviews actually collected; (2) the length of the screening and main interview instrumentation; (3) the "incidence" or "eligibility" rate (i.e., the percent of the general population that qualifies for the interview), and (4) the delivery of any GfK-owned profile information beyond the standard demographic data package. When any of these parameters are changed from the specifications in the proposal, our costs change and therefore a new price needs to be negotiated. Pre-testing the final screening and main interview instruments as well as confirming the incidence (eligibility) rate are required for purposes of quality assurance and for verifying the assumptions made in this proposal for instrumentation length and eligibility rate. The risk to a client of choosing to not conduct a pretest as described above, even if this means repeating the pretest on a revised instrument, is that additional costs could be incurred that will be reflected on the final invoice, the responsibility for which will be borne by the Client. We therefore strongly encourage the use of a pretest prior to full deployment of any survey, particularly those that are sensitive to fluctuations in the key cost elements described above.

Data collected as part of the conduct of the study for the purpose of selecting survey samples will be retained and owned by GfK, unless otherwise stipulated in the subcontract. The Client will have these data for the purposes of analysis, presentation, and publication.

The Client and its directors, officers, employees, consultants, and agents are expressly prohibited from using any information about GfK survey respondents for the purpose of identifying the respondents. The data shall be used only for analyzing and reporting data at the aggregate level, and calibrating sample weights for statistical purposes. In addition, the Client agrees to have any third parties who will have access to identifying information about GfK survey respondents sign a nondisclosure agreement.

GfK is a non-partisan research organization. GfK will not conduct studies for clients or their funders that represent politically partisan organizations, political parties, or candidates for political office.

Costed Options

Below are options available but neither costed nor included in the GfK proposal. We will be happy to provide these options upon request.

- Additional auxiliary profile data from the Health Profile, Public Affairs Profile, Hispanic Profile, and other Profile Surveys
- Coding open-ended data collected in the survey
- Integrating video and audio files into the survey instrument
- Analytic or statistical services such as:
  - Annotated questionnaire (combining the top-line report with the survey questionnaire)
  - Cross-tabulations with significance testing ("banner books") of all survey data
  - Advanced analytic services: Segmentation, Market Simulator Tool, Latent Class Modeling, Maximum-Difference Scaling, etc.

- Sample inclusion of **KnowledgePanel Latino**[SM]. We have built a large Latino panel that includes unassimilated Latinos and Spanish-language dominant households. This supplement to our existing English-speaking Latino households provides the research community a panel of about 5,000 Latino adults that is the best statistically representative online panel of Latino households in existence today. The first projects conducted with KnowledgePanel Latino were funded by the FDA, the IRS, and the Ford Foundation.

- Use of **KnowledgePanel Calibration**. For some studies involving either very large sample sizes or the targeting of very rare subpopulations, it can be most effective to use a blended-sample approach, called KnowledgePanel Calibration, using both KnowledgePanel sample and non-probability samples. With KnowledgePanel Calibration, we conduct the same screening and use the main questionnaire among KnowledgePanel respondents as well as take a companion sample of respondents from an opt-in Web panel. The KnowledgePanel interviews provide the statistical information needed to calibrate the interviews from the non-probability sample source, correcting for sampling error in the non-probability web panels—such as exclusion of non-Internet households and over-representation of hyper Internet users and of early adopters of new products and services, to name just a few. While the calibration approach cannot correct for all the error present in the opt-in panel interviews, the calibration will improve accuracy of study findings and insights, giving researchers more confidence in the data investments they have made.

Payment Schedule

Unless otherwise noted above, seventy percent (70%) of the Fee is due and payable upon signing of the contract and thirty percent (30%) upon Project Completion.

Client Satisfaction Survey at the Completion of the Project

We will ask for your help as our Client to give us feedback on our performance at the conclusion of the study. The feedback you provide us is critical for our ability to improve continuously the quality of our work. Within a week of the conclusion of the study, we will send you by email a Client Satisfaction Survey that will take about three to five minutes of your time. Your answers will not be shared with the project staff who worked with you on the study, but instead will be aggregated with other Client Survey response data to inform of our efforts to deliver extraordinary quality and service to our customers. We thank you in advance for participating in our client feedback program.

Contact Information

Thank you very much for the opportunity to provide this information, and we look forward to the possibility of working with you on this project. Please do not hesitate to call or email me with any questions or requests for additional information or clarifications.

Michael (Mike) Lawrence
Senior Vice President, Government and Academic Research
Consumer Experiences North America
GfK Custom Research, LLC
9702 Schmidt Drive
Burke, VA 22015
(202) 370-6345 office
(202) 615-7511 cell
(707) 988-7654 fax
michael.lawrence@gfk.com

ATTACHMENTS:

GfK Capabilities
GfK Company Information
Key Advantages of KnowledgePanel
Evidence of Representativeness of KnowledgePanel Samples
KnowlegePanel® Methodology Information
Sampling and Recruitment Procedures for KnowledgePanel
Sampling and Recruitment Procedures for KnowledgePanel Latino℠
Connecting the Recruited Households and Initiating Online Surveys
Online Panel Survey Sampling
GfK Processes and Procedures for Conducting Online Panel Surveys
Confidentiality Agreement with Panelists
GfK Clients, Publications, and Prior Experience
GfK Clients, Funders, and Projects Reviewed by OMB
Publications Using Data Collected by GfK
Selected Descriptions of Past Projects Conducted by GfK
Descriptions of GfK Staff
References

Attachments

GfK Capabilities

Documentation regarding KnowledgePanel sampling, data collection procedures, statistical weighting, methodological research, and IRB-related issues are available at the below online resources.

- http://www.knowledgenetworks.com/ganp/reviewer-info.html
- http://www.knowledgenetworks.com/knpanel/index.html
- http://www.knowledgenetworks.com/ganp/irbsupport/

GfK Company Information

The GfK Group offers the fundamental knowledge that industry, retailers, services companies and the media need to make market decisions. It delivers a comprehensive range of information and consultancy services in the three business sectors Custom Research, Retail and Technology and Media. GfK, one of the leading market research organizations worldwide, operates in more than 100 countries and employs over 11,000 staff. In 2010, the GfK Group's sales amounted to EUR 1.29 billion. For further information, visit our website: www.gfk.com. Follow us on Twitter: www.twitter.com/gfk_group.

We have strong working relationships with many of the country's top retail, pharmaceutical/ healthcare, packaged goods, and media companies, as well as many prominent government and academic researchers. In helping them address their most difficult questions, our analysts can turn to an unprecedented array of GfK resources, including:

- KnowledgePanel – the only online panel based on a probability-based sample of the full U.S. population
- KnowledgePanel Latino^{SM} – the only online panel that best represents all aspects of the U.S. Latino community, including Spanish-dominant households and those who were without Internet access
- National Shopper Lab – the largest database of loyalty card shopping behavior available for commercial research
- Digital Market Intelligence – a unique, proprietary technology that enables researchers and marketers to measure the effectiveness of digital content or advertising by adding engaging surveys to online creative as consumers engage in various digital media across the Internet

Physicians Consulting Network (PCN®) – the most comprehensive source of access to physicians and other healthcare professionals available; includes 70,000 U.S. physicians and allied health care professionals covering both primary care and hard-to-reach specialties

GfK is proud to be a member or participate in the activities of the following industry associations:

- American Association for Public Opinion Research (AAPOR)
- Council of American Survey Research Organizations (CASRO)
- Council for Marketing and Opinion Research (CMOR)
- ESOMAR

- The Advertising Research Foundation

There are resources at our Web site that can be accessed to learn more about KnowledgePanel methodology, past projects, relevant methodological research, and the bibliography of articles based on GfK-collected panel data.

Our home page, www.knowledgenetworks.com/ganp/, has the following and other information:

- Methodological information for reviewers, including white papers and articles about KnowledgePanel;
- Bibliography of articles and papers based on KnowledgePanel data;
- Journals publishing articles based on KnowledgePanel data;
- Descriptions of selected past projects;
- KnowledgePanel methodology description; and
- Descriptions of key staff.

Key Advantages of KnowledgePanel

One of the key justifications for using GfK is that it provides the only scientific probability sample of U.S. households that participate in a research panel through the Internet and include both sides of the "digital divide." For gathering information about U.S. public opinion, attitudes, and behaviors, GfK resources include the following:

- **The only online panel based on a sample of the full U.S. population** and therefore the only Web-enabled panel that is based on probability sampling and is nationally representative and statistically accurate

- The computer-assisted interviewing capabilities for supporting complex questionnaire designs for economic, social, political, and other research

- Profiles within our nationally representative panel that include detailed information about health status, political attitudes and behaviors, media consumption, and retail shopping behavior across channels

- A research panel that provides for the ability to conduct the survey work in far less time than in an in-person or telephone survey

Consistent with the above resources, the KnowledgePanel provides key advantages to its clients, including the following:

- **Statistical validity –** The accuracy of any research hinges on the choice of the study sample. KnowledgePanel is representative of the U.S. population as well as randomly sampled subpopulations. KnowledgePanel members are randomly recruited by telephone and address-based sampling and then provided with access to the Internet if needed. Survey estimates based on KnowledgePanel collected data can be used with scientific justification to calculate sampling margins of error, for statistical significance testing, and for confidence interval estimation.

- **A unique environment –** GfK has the advantage of interviewing people in the comfort and privacy of their own homes. Our usual survey completion rates are among the highest in the industry, which maintains the representativeness of the sample. Surveys are addressed to specific members in the household. The panelist can access the questionnaires addressed to them at their convenience.

- **Multimedia capacity –** GfK can easily incorporate graphic images, shelf sets, video, and audio—a combination of media that does not exist in other methods. In addition, the GfK's methodology guarantees consistency of sound and image quality across respondents. Everyone experiences the survey through the same interface.

- **Self-administered, Web-based, computer-assisted interviewing –** GfK's proprietary computer-assisted interviewing system supports conjoint, willingness-to-pay, and other types of surveys that require precise controls on the display of features and attributes, randomization of sample for specific questions and batteries of questions, etc. The system provides for the ability for respondents to complete complex decision tasks and to display graphical information on probabilities and risks.

- **Profile database –** GfK has extensive profiling information available as part of its KnowledgePanel Database, including the following information:

    - Demographics, on the household and individual level
    - Political opinion and behavior
    - Health and well-being
    - Retailer shopping habits
    - Media usage, including readership of specific magazines, general television viewing and radio listening habits, newspaper readership
    - Internet access and online shopping behavior
    - Leisure and sports activities

GfK also has developed some recent innovations that provide clients with even more robust survey research capabilities, including the following:

- **KnowledgePanel Latino[SM] –** GfK built a large Latino panel that includes unassimilated Latinos and Spanish-language dominant households. This supplement to our existing English-speaking Latino households provides the research community a panel of about 5,000 Latino adults that is the best statistically representative, online panel of Latino households in existence today.

- **KnowledgePanel Calibration** – For some studies involving either very large sample sizes or the targeting of very rare subpopulations, it can be most effective to follow a blended-sample approach, called KnowledgePanel Calibration, using both KnowledgePanel sample and non-probability samples. With KnowledgePanel Calibration, we conduct the same screening and main questionnaire among KnowledgePanel respondents as well as a companion sample of respondents from an opt-in Web panel. The KnowledgePanel interviews provide the statistical information needed to calibrate the interviews from the non-probability sample source, correcting for sampling error in the non-probability web panels—such as exclusion of non-Internet households and over-representation of

hyper Internet users and of early adopters of new products and services, to name just a few. While the calibration approach cannot correct for all the error present in the opt-in panel interviews, the calibration will improve accuracy of study findings and insights, giving researchers more confidence in the data investments they have made.

Evidence of Representativeness of GfK Panel Samples

There are four main factors responsible for the representativeness of KnowledgePanel. First, until 2009, the panel sample was selected using list-assisted RDD. Since 2009, KnowledgePanel has started with ABS sampling methodology, providing a probability-based starting sample of U.S. households. Second, the panel sample weights are adjusted to U.S. Census demographic benchmarks to reduce bias due to non-response and other non-sampling errors. Third, samples selected from the panel for individual studies are selected using probability methods. Appropriate sample design weights for each study are calculated based on specific design parameters. Fourth, nonresponse and post-stratification weighting adjustments are applied to the final survey data to reduce the effects of nonsampling error (variance and bias).

A number of methodological studies have been conducted to examine sample representativeness and self-selection bias of KnowledgePanel, most of which are available for downloading at our Web site at http://www.knowledgenetworks.com/ganp/reviewer-info.html. Prior to their publication, many of the peer-reviewed articles based on KnowledgePanel data were subjected to extensive inspection by scientific reviewers, often with specific tests for sample representativeness.

The relevant statistical studies can be grouped into one of the following types:

- *Analyses of Sample Representativeness*
- *Tests for Comparability of Survey Results to Benchmarks*
- *Direct Measurement of Non-Response Bias*
- *Measurement of Self-Selection Bias*

Below is a brief description of studies within each of these categories.

Analyses of Sample Representativeness

KnowledgePanel survey samples are well known for resembling the U.S. Census benchmarks for primary demographics. In the table below, the weighted distribution of Adult KnowledgePanel Members (in total) is displayed for primary demographics; the survey data are weighted for non-response and non-coverage. Interview survey data for general population surveys often approximate this high level of sample representativeness. This level of representativeness is found in RDD and in-person surveys only after substantial investments have been made in refusal conversion.

KnowledgePanel: Demographic Characteristics
Compared to U.S. Census Benchmarks (Weighted) June 2013

		Adult Panel Members	Adult U.S. Population (June 2013 CPS)
Gender	Male	48.2%	48.2%
	Female	51.8%	51.8%
Age	18–24	12.5%	12.8%
	25–34	17.4%	17.5%
	35–44	17.1%	16.7%
	45–54	17.5%	18.3%
	55–64	18.3%	16.5%
	65 or over	17.3%	18.3%
Race	White Only	76.6%	79.2%
	Black (African American) Only	12.7%	12.3%
	American Indian, Alaskan Native Only	1.0%	1.0%
	Asian Only	3.5%	5.4%
	Hawaiian or Pacific Islander Only	0.6%	0.4%
	2+ Races	5.6%	1.7%
Hispanic Ethnicity	Hispanic	15.0%	15.0%
	Non-Hispanic	85.0%	85.0%
Employment Status	In the Labor Force	67.2%	65.6%
	Not in the Labor Force	32.8%	34.4%
Marital Status	Married	52.8%	53.4%
	Not Married	47.2%	46.6%
Housing Ownership	Own	68.9%	68.9%
	Rent/Other	31.1%	31.1%

Tests for Comparability of Survey Results to Benchmarks

- Yeager, Krosnick et al Comparison Survey

A landmark study has been completed recently that is the most comprehensive comparison of KnowledgePanel survey results to RDD telephone and to opt-in non-probability Web panels. The citation for the paper is: David Yeager, Jon Krosnick, LinChiat Chang, Harold Javitz, Matthew Levindusky, Alberto Simpser, Rui Wang. "Comparing the Accuracy of RDD Telephone Surveys and Internet Surveys Conducted with Probability and Non-Probability Samples," August 2009, available at http://communication.stanford.edu/faculty/krosnick/.

The authors administered the same survey instrument to multiple samples: seven non-probability Internet survey platforms were compared to two probability-based survey platforms (telephone survey using RDD and KnowledgePanel). The authors' main conclusion was that the non-probability Internet surveys were less accurate, and customary weighting adjustments did not uniformly improve them.

As shown below, the KnowledgePanel sample was the most representative in terms of primary demographics, even more representative than RDD. The results below are not weighted. On average, the KnowledgePanel interview cases were only 2.47 percentage points off from the Census benchmarks.

Average Error from Benchmarks Comparison Table: Six Primary Demographics [c] *(Without Post-Stratification)*								
Probability Samples		**Non-Probability Samples**						
Telephone (RDD)	Internet (KnowledgePanel)	1	2	3	4	5	6	7
3.43[b]	***2.47***	***4.14[b]***	***4.96[ab]***	***6.44[ab]***	***6.35[ab]***	***7.01[ab]***	***6.05[ab]***	***12.82[ab]***

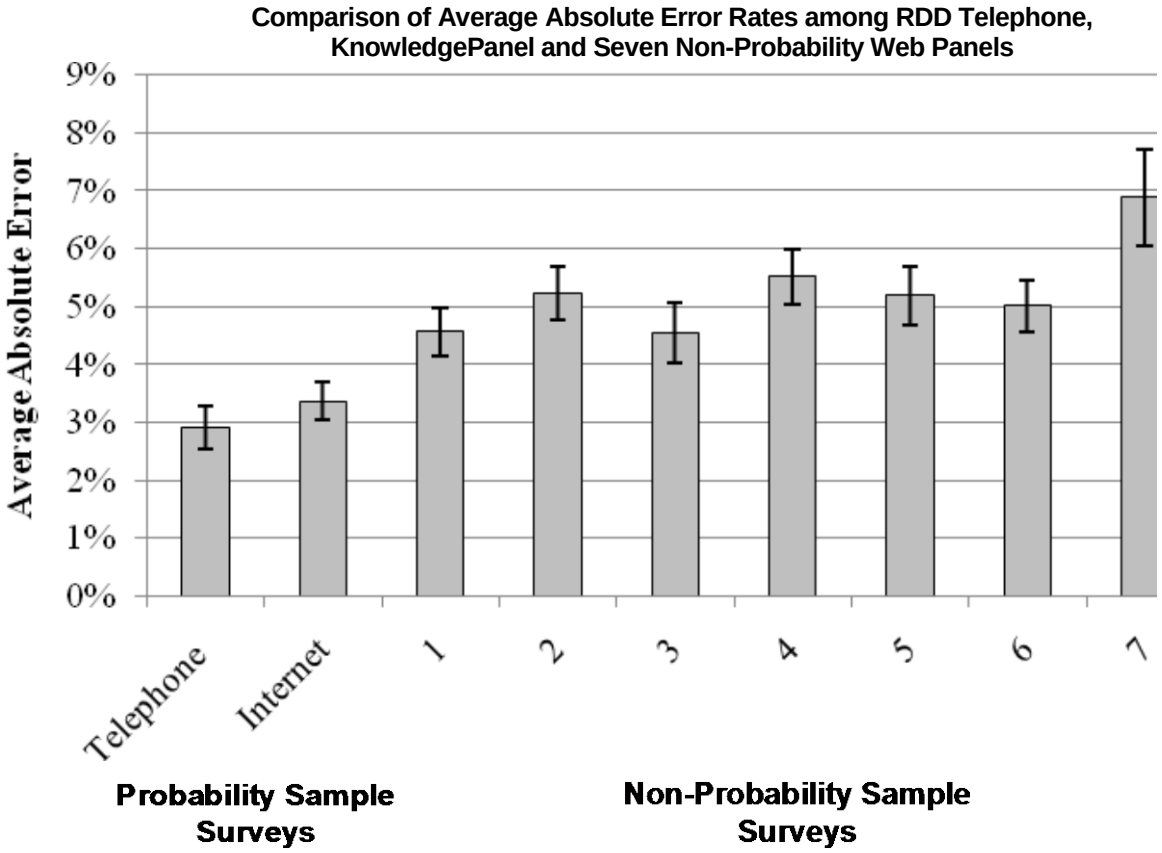
a Significantly different from telephone survey at *p*<.05
b Significantly different from probability Internet survey at *p*<.05
c Age, Gender, Race, Ethnicity, Education, and Region

The authors also compared the platforms' sample representativeness in terms of secondary demographics such as marital and employment status. As shown below, the RDD and KnowledgePanel representativeness were comparable (less than four percentage points off the Census benchmarks), while the non-probability samples were far less representative. These data are not weighted.

Average Error from Benchmarks Comparison Table: Thirteen Secondary Demographics and Non-Demographics *(Without Post-Stratification)*								
Probability Samples		**Non-Probability Samples**						
Telephone (RDD)	Internet (KnowledgePanel)	1	2	3	4	5	6	7
3.64	***3.96***	***5.25[ab]***	***5.79[ab]***	***6.05[ab]***	***4.79[a]***	***4.81[a]***	***5.38[ab]***	***8.93[ab]***

a Significantly different from telephone survey at p<.05
b Significantly different from probability Internet survey at p<.05
c Secondary Demographics: Marital Status, Number of People in Household, Employment Status, Number of Bedrooms in Home, Number of Vehicles Owned, Home Ownership, and Household Income. Non-Demographics: Frequency of Smoking Cigarettes, 12 Drinks of Alcohol or More Lifetime, Average Number of Drinks of Alcohol on Days of Drinking, Ratings of Quality of Their Health, Possession of U.S. Passport, and Possession of a Driver's License.

The authors summarized the error rates for each survey platform. Error rates were calculated as the difference between the objective benchmark (often from U.S. government statistics) and the survey estimate. Again, as shown above for telephone, KnowledgePanel Internet, and the seven non-probability Web panels, the RDD and KnowledgePanel estimates were comparably accurate, and both were more accurate than the results from the non-probability Web panels.



The authors' key findings are:

- **Probability sample surveys** are consistently more accurate whether they are on phone or Internet platforms.
- **Non-probability sample Internet surveys** were always less accurate.
- **Post-stratification with demographics** sometimes improved and sometimes reduced the accuracy of non-probability surveys—therefore this method cannot be relied upon to repair sampling deficiencies.
- **False claim made by advocates of non-probability samples:** "*Optimizing methods of conducting non-probability Internet surveys can maximize their accuracy.*" One of the non-probability surveys was strikingly inaccurate (#7), and the rest were evenly inaccurate at a lower level.
- **False claim by advocates of non-probability samples:** *"A higher completion rate is an indication of higher accuracy."* Completion rates of non-probability surveys were slightly negatively correlated with their accuracy.
- **Low response rates with probability samples do not necessarily mean low levels of accuracy,** if substantial efforts are made to interview as many respondents as possible (i.e., callbacks, follow-ups, incentives, etc.).

Dennis, Osborn (et al, 2009) similarly found significant differences between probability-based and non-probability-based Web panels on attitudinal questions and on measures of Internet usage and frequency of survey taking. In particular, the authors observed that the opt-in panelists were substantially more likely to report attitudes and behaviors consistent with the "early adoption" of new products and services, and reported far higher levels of online survey taking and time spent on the Internet at home.

- Comparing the General Social Survey Findings to a KnowledgePanel Survey

One of the more comprehensive tests of the KnowledgePanel was a comparison of the KnowledgePanel results to those obtained for the General Social Survey, which is the gold-standard Federally-funded survey that tracks social attitude trends in the U.S. GfK staff members have co-authored papers and articles based on a series of studies comparing the KnowledgePanel methodology to the in-person survey conducted by NORC. Dennis and Li (2007; available for downloading at http://ijor.mypublicsquare.com/view/more-honest-answers) examined the role of interviewer effects in accounting for differences observed between the telephone and in-person administrations of the GSS items versus online administration of the same items. Dennis and Li employ an experimental design that provides empirical support for the pattern documented elsewhere in the literature that interviewer-administered surveys can be affected by "social desirability bias." Based on the experiment, the authors concluded:

> (T)here are important differences in the survey results that are attributable to the presence of an interviewer for the in-person and telephone modes, and to the absence of an interviewer in the Web mode. The direction of the differences in the survey results, as seen in how respondents are more likely to report in the Web mode that the country spends "too much" on certain problems in society, is consistent with the conclusion that Web panel respondents are more honest and exhibit more candor in their responses, compared to interviewer-administered surveys. This conclusion is reinforced by the experimental design of our study, which controlled for the source of the sample. To be clear, we are not indicating that we know the "true" measure for public opinion, nor are we suggesting that the online mode survey results are closer to the "truth" about U.S. public opinion. However, we do believe that the differences we observe in the survey results are consistent with the hypothesis that online respondents feel less potent pressure to answer questions in socially desirable ways (Dennis and Li, 2007).

Direct Measurement of Non-Response Bias

- The Boston University Survey Replicating NESARC Using the KnowledgePanel

One of the most thorough examinations of the KnowledgePanel and its usefulness for public health research was conducted by researchers from the Youth Alcohol Center at Boston University. In research supported by the National Institute of Alcohol and Alcoholism of NIH, the researchers commissioned GfK to conduct an epidemiological survey in a replication test of the gold-standard survey conducted by the Census Bureau. The authors' methodological findings were published in *Alcoholism: Clinical and Experimental Research* (Heeren, 2007). The study compares results from the GfK survey to results from the National Epidemiologic Study on Alcohol and Related Conditions (NESARC), a face-to-face probability sample survey of 43,093 adults with a focus on associations between demographics, age of drinking onset, and alcohol dependence. In their conclusion, the authors stated that the KnowledgePanel, as it is based on probability sampling, provides an alternative to random-digit-dial telephone surveys and in-person surveys for studies of factors associated with alcohol-related problems.

The Boston University survey featured a non-response follow-up survey of non-respondents. These non-respondents were randomly selected from the pool of research subjects who refused to join the KnowledgePanel at the time of panel recruitment or joined the KnowledgePanel but later dropped off the panel. This non-response follow-up survey (more than 600 interviews) provided a means for the direct measurement of the attitudes and behaviors of non-respondents. The interviews were conducted by telephone. The authors compared the findings from the non-response follow-up survey to those from the KnowledgePanel Web survey. They found no associations between the type of sample (non-responders versus the KnowledgePanel members) and the risk factors for alcohol dependence (such as family history, risky drinking category, and age of onset of alcohol drinking).

- Civic Attitudes After 9/11: Comparison of KnowledgePanel and KnowledgePanel Non-Responders

A substantial study of non-response bias and the effects of mode of data collection was conducted by RTI and GfK researchers a few months after 9/11 (see Dennis, Chatt, et al, 2005). The full paper and instrumentation are available at: http://www.knowledgenetworks.com/ganp/rtimode.html.

At the time, KnowledgePanel surveys were relatively new and unproven. The purpose of the research was to explore the potential for Internet panel-based survey research by conducting an experiment to investigate survey error that could hinder the validity of Internet-based survey results. In this experiment, the KnowledgePanel methodology was compared to traditional telephone surveys through an experimental design that controls for sample origin. Although previous research done on telephone-Internet surveys had addressed data collection mode effects, none had been done that controls for sample origin. The experiment was embedded in the design of the *Survey of Civic Attitudes and Behaviors After 9/11*, a study sponsored by RTI International (RTII) and co-designed by RTII and the Odum Institute at the University of North Carolina.. Three randomly selected sample groups completed the *Survey of Civic Attitudes and Behaviors After 9/11*: (i) an Internet survey of active KnowledgePanel members, (ii) a telephone survey of active KnowledgePanel members, and (iii) a telephone survey of persons refusing to join the KnowledgePanel and those KnowledgePanel members who did not respond to the web survey. The first two random samples were drawn from active KnowledgePanel members but differed in the mode of data collection (Internet versus telephone). The second and third samples overlapped in terms of mode of data collection (both surveys were conducted by telephone), but the two groups differed in terms of sample origin (active KnowledgePanel members versus refusals). The design, therefore, provides a control group of KnowledgePanel members who participated using the telephone mode of data collection. Various univariate and multivariate statistical tests were conducted in order to measure differences associated with mode of data collection and sample origins. The sources of error investigated are sample representativeness, mode effects, sample effects, panel experience effects, primacy and recency effects, the effects of visual versus aural survey administration, and non-differentiation in survey answers.

Differences among sample groups were found to be due primarily to mode of data collection and panel experience, and somewhat due to sample origin. Basic differences between Internet surveys and telephone interviews could be traced back to mode of data collection: the telephone interview data collected from the KnowledgePanel members were very similar to the telephone interview data from the KnowledgePanel non-respondents. These data indicated that the attitudes and opinions of KnowledgePanel members and those that refused to join the KnowledgePanel are very similar. The differences found between the modes of data collection in this telephone versus Internet study were

strikingly similar to the telephone versus mail mode effects found in civic attitude studies by Tarnai and Dillman and in telephone versus face-to-face mode effects by Krysan. Both studies found a tendency for telephone respondents to answer at the extreme positive end of the scale. In addition, this study found that Internet respondents were more likely than the telephone sample to use the full range of response option scales; therefore, nondifferentiation of survey responses was more prevalent in the telephone sample groups.

Measurement of Self-Selection Bias

GfK has participated in statistical tests using the Heckman selection correction technique for the detection of self-selection bias into the panel and self-selection into actual KnowledgePanel surveys. The statistical techniques, the ecological databases constructed, and the analysis itself are involved and require no modest amount of effort to understand their intricacies, and even more effort to evaluate the work that has been done. The most comprehensive test to date was conducted by Professor Trudy Cameron of the University of Oregon. Her research is detailed as Appendix D entitled "The Knowledge Networks Panel and Sample Selection Corrections" for the paper T.A. Cameron and J.R. DeShazo (2008) "Demand for Health Risk Reductions" (currently in revise resubmit status). The full paper and appendix are available at http://www.uoregon.edu/~cameron/vita/wpabstracts.htm.

Cameron's research found that application of the Heckman selection correction procedure using the RDD sample frame as the base did not support the hypothesis that attitudes toward regulatory issues are correlated with propensity to participate in a KnowledgePanel survey. This test supports the hypothesis that self-selection bias is not an important factor in KnowledgePanel surveys on the subject area of attitudes towards government regulation.

A second but less sophisticated implementation test of Heckman selection correction procedure also did not support the hypothesis that valuations of water quality are highly correlated with the propensity to participate in a KnowledgePanel survey. The use of the Heckman selection correction procedure resulted in an adjusted estimate of -6.16%. This test supports the hypothesis that self-selection bias is not an important factor in KnowledgePanel surveys on the subject area of valuations of public goods such water quality. Source: Joel Huber, W. Kip Viscusi, Jason Bell, "The Value of Regional Water Improvements: Further Evidence," presented at the Valuation of Ecological Benefits Conference, EPA, October 2004. In the same report, the authors also concluded that valuation results of an ecological public good were independent of KnowledgePanel member characteristics such as time in panel, time to complete survey, and high likelihood of quitting panel.

Sampling and Recruitment Procedures for KnowledgePanel

Complete and current information about KnowledgePanel methodology and design is available at www.knowledgepanel.com/ganp

GfK has recruited the first online research panel – KnowledgePanel – that is representative of the U.S. population. Panel Members are randomly recruited by RDD telephone (until 2009) or by mail (since 2009), and households are provided with access to the Internet and hardware if needed. Unlike other Internet research panels sampling only individuals with Internet access volunteering for research, KnowledgePanel surveys are based on a sampling frame which includes both listed and unlisted numbers, is not limited to current Internet users or computer owners, and does not accept self-selected volunteers.

GfK selects households using address-based sampling. Once a person is recruited to the panel, they are contacted primarily by email (instead of by phone or postal mail). This permits surveys to be fielded very quickly and economically. In addition, this approach reduces the burden placed on respondents, since e-mail notifications are less intrusive than telephone calls. Most respondents also find answering Web questionnaires to be more interesting and engaging than being questioned by a telephone interviewer. Telephone calls are used in some surveys to enhance the survey cooperation rate.

Since the founding of the company until recently, KnowledgePanel's probability-based recruitment had relied exclusively on a national random-digit dial (RDD) frame. In April 2009, GfK added address-based sample (ABS) frame (to supplement the RDD frame) in response to the growing number of cell-phone-only households that are outside of the RDD frame. In 2010, GfK transitioned completely to ABS-sourced panel recruitment and ceased recruitment using RDD and telephone methods, with the exception of some telephone-based recruitment to support KnowledgePanel Latino.

The key advantage of the ABS sample frame is that it allows sampling of almost all U.S. households. An estimated 98% of households are "covered" in sampling nomenclature. Regardless of household telephone status, they can be reached and contacted via the mail. Second, our 2009 ABS pilot project revealed some other advantages beyond the expected improvement in recruiting young adults from cell phone-only households, such as improved sample representativeness for minority racial and ethnic groups and improved inclusion of lesser educated and low-income households.

ABS involves probability-based sampling of addresses from the U.S. Postal Service's Delivery Sequence File. Randomly sampled addresses are invited to join KnowledgePanel through a series of mailings and in some cases telephone refusal conversion calls when a telephone number can be matched to the sampled address. Invited households can join the panel by one of several means: by completing and mailing back a paper form in a postage-paid envelope; by calling a toll-free hotline maintained by GfK; or by going to a designated GfK website and completing a recruitment form. Refusal conversion and follow-up with non-contact cases are conducted by telephone and additional mail-outs of refusal conversion materials. In other respects, the recruitment of households by ABS and RDD sampling are the same.

After initially accepting the invitation to join the panel, respondents are then profiled and maintained on the panel using the same procedures established for the RDD-recruited research subjects. Respondents not having an Internet connection are provided a laptop computer and free Internet service. Respondents sampled from the RDD and ABS frames are provided the same privacy terms and confidentiality protections that we have developed over the years and have been reviewed by dozens of Institutional Review Boards.

For the RDD-based sampling that occurred until 2010, GfK utilized list-assisted RDD sampling techniques on the sample frame consisting of the entire U.S. residential telephone population. GfK excluded only those banks of telephone numbers (each consisting of 100 telephone numbers) that had zero or one directory-listed phone numbers. Two strata were defined using 2000 Census Decennial Census data that had been appended to all telephone exchanges. The first stratum has a higher concentration of Black and Hispanic households, and the second stratum has a lower concentration of these groups relative to the national estimates. GfK's telephone numbers were selected with equal probability of selection for each number within each of the two strata, with the higher concentration Black and Hispanic stratum being sampled at approximately twice the rate of the other stratum. The sampling was done without replacement to ensure that numbers already fielded by GfK did not get fielded again.

GfK was able to recover a valid postal address for about 60–70% of all telephone numbers in its samples. The telephone numbers for which an address is recovered were selected with certainty; until July 2005, between one-half and one-third of the remainder (depending on the recruitment period) was subsampled randomly. In May 2007, sub-sampling at a rate of 75% of non-address households was implemented. Households at the address-matched telephone numbers were sent an advance mailing informing them that they have been selected to participate in KnowledgePanel.

Seven to nine days after mailing the advance letters, the telephone recruitment process begins for all sampled phone numbers. Cases sent to telephone interviewers are dialed up to 90 days, with at least 10 dial attempts in cases where no one answers the phone, and for phone numbers known to be associated with households. Extensive refusal conversion is also performed. Experienced interviewers conduct all recruitment interviews. The recruitment interview, which typically requires about 10 minutes, begins with the interviewer informing the household member that he or she has been selected to join KnowledgePanel.

Because we will have recruited panelists from two different sample frames—RDD and ABS, we take several technical steps to merge samples sourced from these frames. Our approach preserves the representative structure of the overall panel for the selection of individual client study samples. An advantage of mixing ABS frame panel members in any KnowledgePanel sample is a reduction in the variance of the weights. ABS-sourced sample tends to align more true to the overall population demographic distributions and thus the associated adjustment weights are somewhat more uniform and less varied. This variance reduction effectively attenuates the sample's design effect and confirms a real advantage for study samples drawn from KnowledgePanel with its dual frame construction.

The first RDD recruitment was conducted in 1999. At that time, all households recruited were given a WebTV to use for answering surveys. In August 2002, GfK began allowing households to complete surveys using their own computers connected to the Internet. Starting at this time, households that did not have a computer and/or access to the Internet from home, work or school were given laptops (rather

than WebTVs) and free monthly Internet access in return for completing a short survey weekly. All members in the household were then enumerated, and some initial demographic variables and background information of prior computer and Internet usage were collected. WebTVs are no longer provided to respondents and were completely phased out in 2010 in favor of laptops.

Sampling and Recruitment Procedures for KnowledgePanel Latino℠

In addition to the above-documented English-based panel recruitment, in 2008 we constructed KnowledgePanel Latino℠ to provide researchers the capability to conduct representative online surveys with the U.S. Hispanic community. Prior to the advent of KnowledgePanel Latino, there did not exist in the U.S. an online panel that represented both Internet and non-Internet Hispanics and that was representative of that part of the U.S. population able to participate in Spanish-only surveys. The sample for KnowledgePanel Latino is recruited by a hybrid telephone recruitment design, based on an RDD sample of U.S. Latinos and Hispanic-surname sample. It is a geographically balanced sample that covers areas that, when aggregated, encompasses approximately 93% of the nation's 45.5 million Latinos.

In addition to the national sample of Latinos that are recruited by RDD, we oversample Latinos residing in 70 U.S. Designated Market Areas DMAs that have relatively large Latino populations. We take this step to increase the sample size of less assimilated or "unassimilated" Latinos. The DMA-oversampling approach is dedicated to the recruitment of Spanish-language-dominant adults that are categorized as "unassimilated" on the basis of Hispanic self-identification, Spanish-language TV viewing frequency, and primary spoken language. The 70 DMAs are grouped into five regions (Northeast, West, Midwest, Southeast, and Southwest). Each region is further divided into two groupings of census tracts, those that have a "high-density" Latino population and the balance made up of all the "low-density" census tracts. The threshold percent for "high density" varies by region. The five regions, each divided into two density groups, constitute 10 unique sample frames (5 x 2).

Using a geographic targeting approach, an RDD landline sample is generated to cover the high-density census tracts within each region. Due to the inaccuracy of telephone exchange coverage, there is some spillage outside these tracts and a smaller degree of non-coverage within these tracts. About 32% of the Latino population across these five regions is theoretically covered with this targeted RDD landline sample. All the numbers generated are screened to locate a Latino household.

The remaining 68% of the Latinos in these five regions are addressed with a listed-surname sample. Listed surnames include households only where the telephone subscriber has a surname that has been pre-identified as likely to be a Latino name. It is important to note that excluded from this low-density listed sample frame are: a) the mixed Latino/non-Latino households where the subscriber does not have a Latino surname and b) all the unlisted landline Latino households. The percentage of listed vs. unlisted varies at the DMA level. The use of the listed surname is intended to utilize cost effective screening to locate a Latino household in these low-density areas, since the rate of finding a Latino household from this list—although not 100%—is still very high. GfK's current composition of KnowledgePanel Latino℠ members is 57% from the National RDD frame, 11% from the high-density Latino RDD frame, and 32% from the low-density Latino Listed Surname frame.

In 2011, the above described hybrid design was replaced with national RDD samples targeting telephone exchanges that penetrate census blocks with a 45% or greater Latino population density (this density level covers just over 50% of the U.S. Hispanic population). Households are screened in the Spanish language to

recruit only those homes where Spanish is spoken at least half the time. In 2012, the census block Hispanic density was raised to 65% to improve the eligibility efficiency of this RDD approach.

This all probability-based RDD Spanish-language sample supplements the Latino households (English and Spanish) that are now recruited through KN's general ABS recruitment sample.

Connecting the Recruited Households and Initiating Online Surveys

GfK attempts to recruit every household member who is 13 years of age or older. For household members aged 13 to 17, we collect consent from the parents or the legal guardian during the initial recruitment interview. If no consent is given, no further direct communication to the teenagers will be attempted.

Prior to shipment, each laptop is custom configured with individual email accounts so that it is ready for immediate use by the household members. Most households are able to install the hardware without additional assistance, though GfK maintains a telephone technical support line and will, when needed, provide on-site installation. Panel members can contact the Panel Member Support Department for questions using a toll-free number. The Panel Member Support Department is available Monday–Friday 9AM–12AM EST and Sat–Sun 12PM–8PM EST. The Support Department also contacts household members who do not respond to survey invitations and attempts to restore contact and cooperation. Panel members who have Internet access provide GfK with their email accounts, and their weekly surveys are sent to that email account.

All new non-Internet panel members are sent an initial survey to confirm equipment installation. For all new panel members, demographic information such as gender, age, race/ethnicity, income, and education are collected in a follow-up survey. This information can be used to determine eligibility for specific studies. This information also eliminates the need for gathering basic demographic information on each panel survey. Once this survey is completed, the panel member is regarded as active and ready to be sampled for other surveys.

Points, which can be redeemed for cash or raffle entries at regular intervals, are given to respondents completing the surveys using their own computer and having their own Internet connection. These point awards take the place of the laptop and monthly Internet access provided to other panel households. Additional incentive points and/or entries to monthly sweepstakes can be added to specific surveys to improve response rates and/or to compensate for longer surveys. These bonus rewards can be given to all households, regardless of their Internet accessibility.

Online Panel Survey Sampling

Once panel members are recruited and profiled, they become eligible for selection for specific surveys. In most cases, the specific survey sample represents a simple random sample from the panel, for example, a general population survey. The sample is drawn from eligible members using an implicitly stratified systematic sample design. Customized stratified random sampling based on profile data also is conducted, as required by specific studies.

The primary sampling rule is not to assign more than six surveys per month to members with the expectation that on average four surveys a month will be completed by a panel member. In certain cases, a survey sample calls for pre-screening; that is, members are drawn from a sub-sample of the panel (e.g., females, Republicans, grocery shoppers, etc.). In such cases, care is taken to ensure that all subsequent survey samples drawn that week are selected in such a way as to result in a sample that is representative of the panel distributions.

In September 2007, GfK was assigned a U.S. Patent (U.S. Patent No. 7,269,570) for its unique methodology for selecting online survey samples. The selection methodology, which has been used by GfK since 2000, ensures that KnowledgePanel samples will closely track the U.S. population.

The selection methodology was developed by GfK in recognition of the practical issue that different surveys target different subpopulations. Often, only panel members with certain characteristics are selected for a survey. This can skew the remaining panel sample and affect the sample representativeness of later surveys. The patented GfK methodology was developed also to attempt to adjust or correct for nonresponse and noncoverage error in the panel sample.

In our patented solution, a survey assignment method uses a weighting factor to compensate for members who are temporarily removed from a panel because of an earlier draw of sample. This weighting factor adjusts the selection probabilities of the remaining panel members. The sample is drawn using systematic probability-proportionate-to-size sampling (PPS) where the panel post-stratification weights will be the measure of size (MOS). If the user requirements call for independent selection by stratum, the panel weights (MOS) are adjusted as follows: (1) sum the MOS for each stratum, call this sum S_h for stratum h; (2) consider the user-specified or system-derived target sample size for stratum h to be n_h; (3) multiply each MOS for members in stratum h by n_h/S_h; and (4) use an interval of k=1 and apply systematic PPS sampling to achieve the desired yield per stratum.

The above solution allows for representative samples to be drawn from the panel, even when earlier surveys oversampled different subpopulations. As an illustration, consider the following example. Suppose Study A requires a 100% oversample of Hispanics from the panel. At the beginning of the time period, each panel member will have an original selection weight, making the panel selection distributions match the demographic benchmarks from the U.S. Census. After the sample draw for Study A is made, the new and temporary selection weights are calculated, making the panel selection distributions match the demographics of the general public. Consequently, the sample draw for Study B will yield a representative sample. Each demographic category in the remaining panel is monitored to ensure that there are enough members in each category to produce representative survey samples. The process is repeated for each study.

The implicit stratified systematic sample design has the additional benefit of correcting, in part, for nonresponse and noncoverage error introduced at the panel recruitment, connection, and retention stages of building and maintaining the panel. This correction is made possible by the fact that the selection weights are calculated using the latest Census Bureau (Current Population Survey) benchmarks for age, gender, race/ethnicity, and educational obtainment. The samples are drawn using systematic PPS sampling where the panel post-stratification weights are the MOS. Therefore, the PPS-based samples are drawn using an MOS, in an attempt to correct for under- and over-representation of certain demographic segments on the panel.

GfK Processes and Procedures for Conducting Online Panel Surveys

Automated Electronic Data Collection

Respondents participate in the surveys using an Internet-connected personal computer. All KnowledgePanel surveys are self-administered online, which allows respondents to complete the surveys at their convenience, in the comfort and privacy of home. The electronic survey system supports the inclusion of video, audio, and 3-D graphics in the questionnaire. Respondents can break off and return to complete an interview during a second or later session. The electronic data collection tracks how long respondents spend on each screen, if requested and programmed into the questionnaire.

Quality Control/Quality Assurance

The GfK Quality Control process encompasses several steps: survey scripting and the QC process, Word document review, test cases and pretests, online client review of the programmed questionnaire, and final revisions and edits. The stages that the QC manager supervises include the following:

- Review questionnaire Word document
- Review logic flow
- Review behavior of sample variables (used in skip logic)
- Estimate number of test cases to be performed
- Complete Quality Control Checklist/Perform test cases on computer
- Perform data verification
- Re-test for corrections
- Configure sample variables
- Assign survey to panelists' accounts
- Test on Internet platform
- Assign survey to panel members for one or more pretests
- Assess pretest results
- Make any corrections as needed
- Assign survey to main survey sample according to the sample plan

Respondent Incentives

Respondent incentives of two types are provided: survey-specific and non-survey-specific incentives. Below we describe each briefly.

Non-survey-specific incentives are used to maintain a high degree of panel loyalty and to prevent attrition from the panel. For the households provided Internet appliances and an Internet connection, their incentive is the hardware and Internet service. For households using their own personal computers and Internet service, GfK enrolls the panelists in a points program that is analogous to a "frequent flyer" card in that respondents are credited with points in proportion to their regular participation in surveys. Panelists receive cash-

equivalent checks approximately every four to six months in amounts reflecting their panel participation level, commonly $2 to $6 per month.

The survey-specific incentives are provided to respondents as a result of one of two conditions: (1) the survey is expected to require more than 20 minutes of time to complete; or, (2) there is an unusual request being made of the respondent, such as providing a specimen, viewing a specific television program, or completing a daily diary. In these circumstances, panelists are being asked to participate in ways that are more burdensome than initially described during panel recruitment. As an example, for the NOAA Coral Reef Protection Survey, an incentive was provided because the survey was expected to require 20 or more minutes to complete and maximizing survey participation was a key study goal. Respondents who participated in that survey were credited with 10,000 points, which equates to $10 that was mailed to them at a later date.

A by-product of the use of survey-specific incentives is an improvement in the survey completion rate. Internal GfK research has demonstrated that use of monetary incentives increase the survey completion rate by approximately five percentage points. The increase is larger for groups such as young adults and Hispanics.

Methods Used to Maximize Survey Completion Rates

GfK employs its best practices for maximizing survey cooperation rates. These measures can provide a survey completion rate of up to 70% and higher. If the study schedule, budget, and design are supportive of maximizing the survey completion rate, the following procedures are followed:

- Field period of two to four weeks
- Respondent incentives of $5 to $10 for participation, especially for surveys requiring 25 or more minutes of survey respondent time
- Use of the Federal agency or University/College name in the email invitation
- Email reminders
- Telephone reminder calls to non-responders.

Confidentiality Agreement with Panelists

Survey responses are confidential, with identifying information never revealed without respondent approval. When surveys are assigned to panel members, they receive notice in their password-protected email account that the survey is available for completion. Surveys are self-administered and accessible any time of day for a designated period. Participants can complete a survey only once. Members can leave the panel at any time, and receipt of the laptop and Internet service is not contingent on completion of any particular survey.

When joining the panel, all KnowledgePanel members are given a copy of the Privacy and Term of Use Policy. In the privacy terms, there is a section called the “Panel Member Bill of Rights” that summarizes the confidentiality and privacy protections for panelists and explains that respondents can decide whether to participate in the panel or to answer any survey questions. The “Bill of Rights” is also available electronically at all times to panelists through the panel member Web site. The “Bill of Rights” is shown below.

KnowledgePanel Member Bill of Rights

We are researchers, not telemarketers. Here's what we can promise you:

- never try to sell you anything.
- never misrepresent ourselves or what we are doing.
- provide your survey responses and other information to our clients in anonymous form only, unless you have given your express permission. (We generally do not seek such permission.)
- make sure that your KnowledgePanel survey workload remains reasonable.
- provide ongoing support and technical advice relating to KnowledgePanel participation.
- respect your decision to not answer survey questions if you so choose.
- do our best to ensure your participation in KnowledgePanel is a pleasant experience.

Among other topics, the privacy terms also explains the security procedures that are employed by GfK:

GfK uses advanced security measures to protect against the loss, misuse, and alteration of the information under our control. All Panel Members are required to use passwords and usernames. Our Web server supports SSL (Secure Socket Layer) Encryption security technology. All access to our database is restricted to portals only we control.

Below is a description of some of the measures that have been taken to meet the needs for privacy and confidentiality from the standpoint of data access and information technology.

First, all employees of GfK are required to sign a confidentiality agreement requiring them to keep confidential all personally identifiable information regarding panel members. GfK warrants that all employees are bound to protect the privacy and confidentiality of all personal information provided by respondents, and very few employees actually have access to any confidential data. The only employees who have access to this information, which contains personal identification information about panel members, are those with a direct need to know. Therefore, the only persons with access are the following:

- Database and IT administrators with access to computer servers for the purpose of maintaining the computers systems at GfK;

- Staff members in the Panel Relations department who have direct contact with panel members as part of the inbound and outbound call center operations. These staff members are responsible for troubleshooting any problems panelists might have with their equipment or software related to survey administration, incentive fulfillment, and panel management.

- Staff members of the Statistics department who have access to personally identifying information in order to draw samples for the various surveys we conduct at GfK.

All personally identifying records are kept secured in a separate office in the Informational Technology section of the GfK office in Palo Alto, CA, and all data transfers from personal computers (both used for survey administration) to the main servers pass through a firewall. GfK never provides any respondent personal identifiers to any client or agency without the explicit and informed consent provided by the sampled KnowledgePanel Members. Unless explicitly permitted as documented in a consent form, no

personally identifying information will be provided to any parties outside GfK in combination with the survey response data.

All electronic survey data records are stored in a secured database that does not contain personally identifying information. The staff members in the Panel Relations and Statistics departments, who have access to the personally identifying information, do not have access to the survey response data. Meanwhile, the staff members with access to the survey response data, with the exception of the aforementioned database and IT administrators who must have access to maintain the computer systems, do not have access to the personally identifying information. The secured database contains field-specific permissions that restrict access to the data by type of user, as described above, thereby preventing unauthorized access.

The survey response data are identified only by an incremented ID number. The personally identifying information is stored in a separate database that is accessible only to persons with a need to know, as described above.

The survey data extraction system exports only anonymized survey data identified only by the Panel Member ID number. The data analysts with access to the survey data extraction system, as they do not have access to personally identifying information, cannot join survey data to personally identifying data. Panel Relations and Statistics staff does not have access to the survey data extraction system, and therefore cannot join survey data to personally identifying data.

As part of its work with Research Triangle Institute International on surveys conducted in support of FDA applications, GfK has implemented Good Clinical Practice guidelines to assure compliance with FDA requirements for systems documentation and privacy of stored survey data. Consequently, a system of standard operating procedures is in place for documenting all processes relating to maintaining confidentiality and privacy of the identities of panel members.

GfK retains the survey response data in its secure database after the completion of a project. These data are retained for purposes of operational research, such as studies of response rates and for the security of our customers who might at a later time request additional analyses, statistical adjustments, or statistical surveys that would require re-surveying research subjects as part of validation or longitudinal surveys.

GfK Clients, Publications, and Prior Experience

GfK Clients, Funders, and Projects Reviewed by OMB

GfK conducts a wide range of research in the fields of public policy, health and social policy, health services, epidemiology, environmental protection, political science, sociology, and social psychology. Researchers in these and other fields have conducted text-based and multimedia surveys using the Web-enabled KnowledgePanel because the panel is based on a probability sample of U.S. households designed to be representative of the U.S. population.

With KnowledgePanel as the foundation, GfK is a full-service research provider with capabilities for customer Internet surveys, public policy and attitudinal research, concept and segmentation research, moderated online focus groups, market sciences and analytics, and statistical weighting and estimation. Our customers include academic- and foundation-based researchers from the University of Pennsylvania, the University of Chicago, Stanford University, Duke University, Harvard University, Yale University, and New York University, to name a few, as well as federal agencies through various teaming arrangements and other work conducted for the FDA, NOAA, EPA, USDA, and the CDC. We partner with the Program on International Policy Attitudes at the University of Maryland for public opinion research on foreign policy issues. Survey results based on our survey data have been cited prominently by the Associated Press, CBS News, NBC, and other media. Peer-reviewed and scientific articles based on GfK-collected data have been published in *Alcoholism*, *Health Services Research*, *Journal of the American Medical Association*, *Mortality and Morbidity Weekly Report*, *Nature*, *Public Opinion Quarterly*, and *Science*, among others. Lists of selected past projects and journals that have published articles based on GfK survey data results are available at the following site: http://www.knowledgenetworks.com/ganp/.

Below is a list of selected institutions whose IRB has reviewed and approved study protocols for conducting Web panel surveys on KnowledgePanel.

Abt Associates
Arizona State University
Baylor University
Boston College
Brigham Young University
Bryn Mawr University
Colorado State University
Cornell University
Duke University
George Mason University
Georgetown University
Georgia Institute of Technology
Indiana University
Harvard University
Johns Hopkins University
M.I.T.
Michigan State University
New York University
Princeton University
Research Triangle Institute
Stanford University
University of British Columbia
University of California, Berkeley
University of California, Irvine
University of California, Los Angeles
University of Chicago
University of Illinois
University of Kentucky
University of Maryland
University of Michigan
University of Minnesota
University of Notre Dame
University of Pennsylvania
University of Tennessee
University of Texas, Austin
University of Virginia

North Carolina State University
Ohio State University
Penn State University
University of Wyoming
Vanderbilt University
Yale University

Below is a partial list of funding agencies and organizations that have supported research conducted by GfK.

American Bar Foundation
American Legacy Foundation
Annenberg Foundation Trust at Sunnylands
California Air Resources Board
Chicago Council on Global Affairs
Ford Foundation
Gates Foundation
March of Dimes
Markle Foundation
John T. & Catherine D. McArthur Foundation
National Bureau of Economic Research
National Cancer Institute
National Institute on Aging
National Institutes of Health
National Institute of Alcohol Abuse and Alcoholism
California, Dept of Public Health, Tobacco Control Section
U.S. Department of Agriculture, Economic Research Service
U.S. Department of Defense, Joint Advertising Market Research & Studies
U.S. Department of Health & Human Services, Health Resources and Services Administration
National Institute of Mental Health
National Science Foundation
Pew Charitable Trust
Robert Wood Johnson Foundation
Rockefeller Foundation
Russell Sage Foundation
Alfred P. Sloan Foundation
Social Security Administration
Rockefeller Foundation
Templeton Foundation
United Way
U.S. Air Force
U.S. Centers for Disease Control & Prevention
U.S. Environmental Protection Agency
U.S. Food & Drug Administration
U.S. Department of Health & Human Services, Office of Population Affairs
U.S. National Oceanic and Atmospheric Administration
U.S. Department of Veterans Affairs, Center on the Demography and Economics of Health and Aging
U.S. Internal Revenue Service

Below is a list of selected past projects, including Principal Investigators, and funding agencies.

Principal Investigator Name and Title (Phone Number)	**Organization Affiliation**	**Project Name**	**Funding Agency**
Tom Tyler Professor (212) 998-7816	New York University Department of Psychology	Longitudinal Study of Worker Attitudes	Alfred P. Sloan Foundation
Cliff Zukin Professor (732) 932-9384 x247	Rutgers University Eagleton Institute of Politics	Youth Civic Engagement Survey	Pew Charitable Trust
Linda Skitka Associate Professor (312) 996-4464	University of Illinois-Chicago Department of Psychology	Deonance Survey	National Science Foundation
Jennifer Lerner Assistant Professor (412) 268-4573	Carnegie-Mellon University Department of Psychology	Aftermath of 9/11 Stress and Coping Study	National Science Foundation
Kip Viscusi Professor	Vanderbilt Law School	Duke-Harvard Water Quality Study	Environmental Protection Agency

Loren Baker Associate Professor (650) 723-4098	Stanford University Health Research and Policy	Health Consumer Information Study	Veterans Administration, Center on the Demography and Economics of Health and Aging

Below is a partial list of studies conducted by GfK that were reviewed and approved by the Office of Management and Budget (OMB). Please see the complete list on our website.

Principal Investigator	**Organization Affiliation**	**Project Name**	**Funding Agency**	**OMB Approval Number**	**OMB Approval Date**
David Chapman	Stratus Consulting	Coral Reef Economic Valuation Pretest	National Oceanic and Atmospheric Agency	0648-0531	11/16/2005
Linda Verrill (FDA)	CFSAN, FDA	Survey of Persons with Food-Specific Allergies	Food & Drug Administration	N.A.	8/2005
Jason F. Shogren	University of Wyoming, Department of Economics and Finance	Estimating Consumer Benefits of Improving Food Safety	United States Department of Agriculture	0536-0062	3/11/2005
Kip Viscusi	Harvard University, Law School	Water Quality in America Main Interview	Environmental Protection Agency	2010-0031	4/2004
George L Van Houtven	Research Triangle International	Estimating the Value of Improvements to Coastal Waters - A Pilot Study of a Coastal Valuation Survey	Environmental Protection Agency	2090-0024	1/22/2004
James K. Hammitt	Harvard University, Center for Risk Analysis, Department of Health Policy and Management	Estimating Consumer Benefits of Improving Food Safety	United States Department of Agriculture	0536-0062	12/16/2003
George L Van Houtven	Research Triangle International	Eliciting Risk Tradeoffs for Valuing Fatal Cancer Risks	Environmental Protection Agency	2060-0502	2/19/2003
Kip Viscusi	Harvard University, Law School	Water Quality in America Pretest Round 3	Environmental Protection Agency	2010-0031	4/2003
Kip Viscusi	Harvard University, Law School	Water Quality in America Pretest Round 2	Environmental Protection Agency	2010-0031	2/2003
Kip Viscusi	Harvard University, Law School	Water Quality in America Pretest Round 1	Environmental Protection Agency	2010-0031	10/2002
Carol Prindle and Paul Mowery	Research Triangle International	Reactions to Canadian Style Cigarette Warning Labels	Center for Disease Control	0920-0565	8/19/2002

Publications Using Data Collected by GfK

The current publication list can be viewed by clicking on the "bibliography" at www.knowledgenetworks.com/ganp/.

The following is a list of selected journals that have published survey results from KnowledgePanel data:

Communications
Communication Theory
Information, Communications & Society
International Journal of Internet Science
Journal of Broadcasting & Electronic Media
Journal of Communication
Mass Communication & Society
Political Communication
Studies in Media & Information Literacy Education
Telecommunications Policy

Environmental Studies
Environmental Science & Technology
Journal of the Air and Waste Management Association

Economics
American Economic Journal: Applied Economics
American Economic Review
Challenge
Journal of Applied Econometrics
Journal of Risk and Uncertainty
Land Economics
Review of Network Economics

Health & Medicine
Alcoholism: Clinical and Experimental Research
Alimentary Pharmacology & Therapeutics
Allergy and Asthma Proceedings
Alzheimer Disease & Associated Disorders
Archives of Internal Medicine
Archives of Pediatric Adolescent Medicine
American Journal of Medicine
American Journal of Preventive Medicine
American Journal of Public Health
Current Sexual Health Reports
Diabetes Care
Families, Systems & Health
Health Affairs
Health Services Research
Journal of Adolescent Health
Journal of the American Dietetic Association
Journal of the American Medical Association (JAMA)
Journal of Clinical Epidemiology
Journal of Clinical Oncology

Health & Medicine, continued
Journal of Food Protection
Journal of Sexual Medicine
Journal on Women's Health
Menopause
Morbidity & Mortality Weekly Report (CDC)
Pediatrics
Quality of Life Research
Vaccine

Multidisciplinary Journals
Applied Developmental Science
Biosecurity and Bioterrorism: Biodefense Strategy, Practice and Science
International Journal of Industrial Organization
NATURE
Nature Nanotechnology
Proceedings of the National Academy of Sciences
Science

Public Opinion Research
Hoover Digest
International Journal of Public Opinion Research
Polling Report
Public Opinion Pros
Public Opinion Quarterly
Public Perspective

Psychology
Annual Review of Psychology
Applied Cognitive Psychology
Archives of General Psychiatry
Australian Journal of Psychology
Basic and Applied Social Psychology
Canadian Journal of Psychiatry
Journal of Aggression, Maltreatment & Trauma
Journal of Applied Social Psychology
Journal of Cross-Cultural Psychology
Journal of Personality and Social Psychology
Journal of Post-Traumatic Stress
Journal of Traumatic Stress
Journal of Trauma and Dissociation
Motivation and Emotion
Personality and Social Psychology Bulletin
Psychological Science

Political Science
American Journal of Political Science
American Political Science Review
Journal of Politics
Political Analysis
Political Behavior
Political Psychology
Political Research Quarterly
Political Science Quarterly
Presidential Studies Quarterly
PS – Political Science & Politics

Sociology
American Criminal Law Review
Criminology
Du Bois Review: Social Science Research on Race
Harvard Law Review
International Security
IT & Society
Journal of Conflict Resolution
Journal of Consulting and Clinical Psychology
Journal for the Scientific Study of Religion
Journal of Family Issues
Journal of Marriage and Family
Language Assessment Quarterly
Language Policy
Law and Human Behavior
Police Quarterly
Social Forces
Social Influence
Social Justice Research
Social Problems
Social Research: An International Quarterly of Social Sciences
Social Science Computer Review
Social Science & Medicine

Selected Descriptions of Past Projects Conducted by GfK

Extensive information about past projects conducted by GfK based on its Web-enabled panel can be accessed at www.knowledgenetworks.com/ganp/. Below are selected past experience summaries:

American National Election Surveys, 2008–2009
Client: Stanford University
Funded by: National Science Foundation
Period of Performance: 2007 to 2009
Project Description: The American National Election Studies (ANES) has involved the collection of national survey data on voting, public opinion, political participation, and other related research topics since 1948. This project is a "public good," meaning that data are collected to serve social scientists throughout the world. As part of the 2006–2009 ANES, a national Internet panel survey of 21 waves was conducted using a special new panel created by GfK. A new ANES Web panel was created by GfK and maintained for this purpose, funded by the National Science Foundation with professional support by Stanford University. The complete documentation and publicly usable dataset for the ANES web panel is available at www.electionstudies.org.

A key objective of the ANES Web panel is to track election-related judgments and behaviors during the course of the 2007–2008 general election campaign and in the post-election period. To permit this, approximately 4,000 randomly selected U.S. adult citizens were recruited to complete monthly surveys. The end result will be a unique resource for social science researchers worldwide for longitudinal analysis.

The ANES Web panel sample does not overlap with the existing KnowledgePanel; the ANES Web panel represents a separate sample and was created specifically and exclusively for the ANES. GfK built the ANES Web panel from October through December 2007, with additional recruitment conducted during the fall of 2008. Seven of the monthly surveys cover political content specifically for ANES use; the remaining monthly surveys are available to other scholars, who can purchase the opportunity to conduct research on non-political topics. The effective sample size for each wave was approximately 2,500 interviews.

In developing this custom panel, GfK implemented several steps, including the following:

- Selected the random-digit-dialing (RDD) sample
- Prepared the sample file for use during telephone-based screening and recruitment
- Screened households for eligibility and randomly selected an adult age 18 years or older as of November 4, 2008
- Conducted a telephone recruitment interview with the selected respondent
- Created a sample file for the ANES Web panel interviews containing the recruited respondent's demographic data, home addresses, e-mail address, and other data collected during the RDD recruitment interview
- Conducted monthly interviewing
- Minimized attrition through retention measures
- Evaluated the effectiveness of the retention measures for maintaining ANES Web panel survey participation over time
- Delivered to Stanford University all the data files, reports, and other deliverables

For this project, GfK was responsible for all tasks related to panel initiation, panel management, and conducting surveys. In carrying out this project, GfK leveraged its computer systems, infrastructure, standard operating procedures, and panel management experience acquired as a result of recruiting and maintaining the proprietary KnowledgePanel (50,000 adult members) since the inception of the company.

National Annenberg Election Survey, 2007–2009
Client: University of Pennsylvania
Funded by: Annenberg Foundation Trust at Sunnylands
Period of Performance: 2007 to 2009
Project Description: This tracker survey was designed to support longitudinal data analysis for the entire 2008 general election campaign and post-election period, tests for possible panel conditioning effects, and weekly point estimates for population-based shifts in policy and political attitudes. The study population consists of U.S. non-institutionalized adults age 18 and older. The study population therefore contains both likely and unlikely voters; a likely voter screen was not employed for sample selection. Tracking participants are sampled from KnowledgePanel, and all panel data collection was undertaken by GfK.

The overview of the sample design in terms of time and data collection waves is as follows:

- Wave 1: A large pre-primary baseline survey—between October 1, 2007 and the winter holidays
- Wave 2: A political primary period wave—January to March, 2008
- Wave 3: A low-intensity wave between the end of the primaries and the start of the general-election campaign—April 1 to August 28, 2008
- Wave 4: A general-campaign wave—August 29 to November 4, 2008
- Wave 5: A post-election wave—November 5, 2008 to January 31, 2009

Wave 1 consisted of fresh cross-sectional sample interviews. Waves 2 through 5 consisted of a mix of follow-up interviews of baseline participants and fresh cross-sectional samples. The latter are included for purposes of statistical tests for panel conditioning. The table below summarizes the wave sample sizes:

Table 1: Number of Completed Interviews by Wave of Data Collection and Sample Type

Data Collection Waves	**Wave1**	**Wave 2**	**Wave 3**	**Wave 4**	**Wave5**	
Field Period	October-December 2007	January 1 – March 31 2008	April 1 – August 28 2008	August 29 – November 4 2008	November 5 – January 31, 2009	**Totals**
Typical Sample	18,200	14,560	13,650	12,740	11,830	**70,980**
New KnowledgePanel – First NAES Survey	1,800	1,800	3,000	1,300	1,800	**9,700**
New KnowledgePanel Sample – Followup NAES Survey		1,440	2,790	5,010	5,720	**14,960**
Totals	**20,000**	**17,800**	**19,440**	**19,050**	**19,350**	**95,640**

2007–2008 AP-Yahoo Election Survey
Client: Associated Press
Funded by: Associated Press / Yahoo
Period of Performance: November 2007 to December 2008
Reference: Trevor Tompson, Director of Polling, Associated Press

Project Description: From November 2007 to December 2008, GfK conducted an eleven-wave longitudinal election study on behalf of the Associated Press (AP) and Yahoo. The year-long longitudinal design allowed AP and Yahoo to report on the political pulse of the nation and measure opinion change leading up to the primary elections through the presidential election in November 2008. The interview completion goal for the study was to collect approximately 2,000 completes at the final wave of the study. Another key component of the project was the ability for AP to conduct follow-up telephone interviews with panel members who agreed to speak to a reporter. This allowed AP to include respondent stories and quotes in news articles and reporting throughout the election year.

During the 13-month study, GfK implemented several steps, including the following:

- Selected nationally representative sample from KnowledgePanel for the longitudinal study
- Selection of three fresh cross-sectional samples conducted at waves 3, 6, and 9
- Delivered a variety of custom post-stratification weights to allow for analysis of key demographic groups
- Fielded 11 surveys across the 13-month study
- Programmed and fielded surveys on a quick-turnaround basis, specifically during the last few months of the presidential campaign
- Developed incentive plans to maximize response in key demographics and speed of response during the late stages of the study
- Handled custom email and phone reminders
- Production of top-line reports for the AP Web site and news stories
- Arranged for access to KnowledgePanel members who agreed to speak to AP reporters
- Conducted the Election Day survey with a field period of one day for voter feedback; delivered weighted data the night of the election
- Developed retention measures for maintaining the original sample selected for the longitudinal study
- Delivered to AP all the data files, reports, and other deliverables
- Hosted publicly available website for survey data and reports

Election 2008 & Beyond
Client: University of Chicago
Funded by: Ford Foundation
Period of Performance: 2008 to 2010
PI and Reference: Professor Cathy J. Cohen, Ph.D., David and Mary Winton Green Professor of Political Science and former Director of the Center for the Study of Race, Politics and Culture at the University of Chicago

Project Description: The Election 2008 & Beyond project measured longitudinally the attitudes, knowledge, and behaviors of U.S. adults in the month leading up to the November 4, 2008 general election and subsequently at two points in time after that election (June–July 2009 and December 2009–January 2010). The aim of the study was to measure the effective political mobilization of racial and ethnic minorities as a result of the Obama candidacy and then to measure the extent to which that mobilization would persist after the election. The study was designed to have adequate sample sizes for measuring the effects of race, ethnicity, gender, and social class. A key component of the project was the oversampling of African Americans and Spanish-speaking Hispanics by using KnowledgePanel Latino.

To meet the goals of the project, 3,181 randomly selected U.S. adults age 18 and older completed the baseline survey, with just over 13% of respondents Asian and the rest of the respondents split approximately equally between African Americans, Hispanics, and Whites. Within each race/ethnicity group, approximately 33% of respondents were aged 18–34 with the remaining respondents aged 35+.

To complete the project, GfK implemented several steps including the following:

- The study samples were a mix of cross-sectional and longitudinal interviews. Fresh cross-sectional cases interviewed for the baseline survey were retained and sampled with certainty for the two follow-up surveys. Sample loss was replaced with the insertion of fresh cross-sectional samples for the follow-up surveys, with the goal of obtaining a minimum of 750 African American respondents, 750 Hispanic respondents, 750 white respondents, and 450 Asian respondents at each wave, while also maintaining the 18–34/35+ age split within each race/ethnicity group.
- KnowledgePanel Latino[SM] was used for sampling the Hispanic portion of the population, providing greater coverage of the non-English-speaking Latino population. The sample was designed to reflect the Census distribution of Hispanics by language groupings: Dominant English speakers; Bilinguals; Dominant Spanish speakers.
- The survey was translated into Spanish by experienced bilingual survey research staff to facilitate accurate and appropriate language use.
- A variety of techniques was employed to minimize attrition between survey waves. These included the retention of baseline survey respondents even if they left KnowledgePanel, enhanced use of respondent incentives, pre-notification emails for each survey wave, and a series of reminder email messages and telephone calls to non-respondents.
- Post-wave in-depth interviews were conducted by telephone after the baseline and final follow-up survey (48 interviews per round), probing the answers respondents provided to the survey.

More information about the research project is available at http://www.2008andbeyond.com

Survey of Young Americans
Client: Harvard University, Institute of Politics (IOP)
Funded by: Harvard University, Institute of Politics
Period of Performance: 2009, ongoing
Reference: John Della Volpe, Director of Polling, IOP
Project Description: This is a series of fall and spring surveys of young Americans (18 to 29 year olds), including both those who are attending a college or university and those who are not. The fall survey is slightly smaller (N=2,000 English-language survey takers) than the spring survey (N=3,000 English-

and Spanish-language survey takers). The topics cover the major issues of the time period. For example, the Spring 2010 survey asked about concerns with economic, health care, and national security issues; the job performance of President Obama, Congressional Democrats, and Congressional Republicans; volunteering in community service and participating in political activities; trust in particular individuals and institutions; political, economic, and social views; financial concerns and employment priorities; and the use of social networking tools. We obtained 3,117 completed interviews for the spring 2010 survey. The cooperation rate was 67% for the KnowledgePanel sample (N=2,561, including 273 interviews in Spanish) and 10% for an opt-in sample (N=556). The margin of error for the polls is approximately +/– 2.3 percentage points at the 95% confidence level.

Chicago Council on Foreign Relations: American Public Opinion & U.S. Foreign Policy, 2004 & 2006
Client: Chicago Council on Foreign Relations
Funder: CCFR
Period of Performance: June 2004 to August 2004, and May to July 2006
Project Description: The Chicago Council (CCFR) and the Program on International Policy Attitudes (PIPA) of the University of Maryland undertook a joint research effort to measure U.S. public opinion about America's role in the world. GfK conducted the survey of 1,195 adults using its Web-enabled panel; the instrument required about 40 minutes on average for participants. The survey results were published in October 2004 in the report entitled "The Hall of Mirrors: Perceptions and Misperceptions in the Congressional Foreign Policy Survey." GfK conducted the survey again for CCFR in 2006.

Stratus Consulting: NOAA Coral Reef Protection Survey
Client: Stratus Consulting
Funded by: NOAA
Period of Performance: December 2004 to January 2010
Project Description: This project was a stated preference survey for measuring valuations of the coral reefs near Hawaii. The preference survey measured valuations in light of attributes related to no-fishing zones, cost, harm to shipping, etc. The survey started with a screen of the general population households from the KnowledgePanel. The survey was fielded to a national representative sample of the U.S. adult population drawn from the KnowledgePanel and GfK ANES panel. A total of 1,308 panelists from the KnowledgePanel completed the survey between November 2009 and January 2010, and 2,335 panelists from the GfK ANES panel completed the survey between June and July 2009. The average interview length was approximately 30 minutes.
Project Outcomes: These data were presented in an NOAA report to assist in the formation of policies to protect coral reefs and for estimating the non-use value of the coral reefs.

NOAA: Longitudinal Seafood Consumption Survey
Client and funder: NOAA
Period of Performance: December 2004 to March 2006
Project Description: This project consisted of a two-stage survey involving screening of a general population of U.S. adults and then a main interview of qualified adults. The screening took place with 21,000 households' primary grocer shoppers to identify fish consumers. The screening survey identified households' levels of seafood consumption. This screened-in sample was augmented with 6,000 newly screened households not previously selected for this study. At least 1,200 primary grocer shoppers representing 1,200 unique households were identified as eligible for the main interview, supplementing the 21,000 that were previously screened. The main instrument provided monthly and quarterly estimates of seafood fish consumption over a 12-month period. The sample design involved three cohort samples that were re-interviewed every fourth month and three additional fresh cross-sectional cohorts that were introduced in months 7, 8, and 9 in order to maintain monthly samples sizes in the range of 700 to 800 interviews per month, for a total of 9,175 interviews over the 12-month data collection period. Each cohort represented a random sample of cases that were eligible for the survey based on stage 1 screening. In total, 9,175 main interviews were completed over the 12 months of the project.
Project Outcomes: These data supported analysis of within-subject change in fish consumption over the course of a calendar year, as well as supporting estimations of monthly and quarterly fish consumption rates. This information provides NOAA's National Marine Fisheries Service with longitudinal consumption data for both policy and research purposes.

Harvard University: EPA Water Quality Survey: Main Study
Client: Harvard University
Funded by: EPA
Period of Performance: August, 2005 to December, 2006
Project Description: The EPA funded Profs. Joel Huber from Duke University's Fuqua School of Business and W. Kip Viscusi of the Harvard Law School to examine the ways people make the choice between moving to an area better on water quality vs. one better on cost of living. Viscusi and Huber chose to commission GfK to conduct a general population Web-enabled panel survey to determine the value individuals place on clean lakes and rivers in the U.S. The study employed contingent valuation methodology to examine the amount of money individuals are willing to pay for clean lakes and rivers in their region. Compared to other methodologies, contingent valuation methodology is quite challenging for respondents because it requires them to comprehend and remember significant amounts of information at the same time they are making difficult choices among alternatives that have several simultaneously varying features (e.g., cost and pollution differences across alternatives). GfK used color graphics to reduce respondents' burden by making the choice process less cognitively taxing. For each choice screen, respondents chose among three alternatives, with each alternative and its associated features arranged vertically within a matrix. The survey effectively used color and layout to organize the labels and features to make it easy for respondents to choose their most preferred alternative. The choice process was aided by a design innovation—for each successive choice in a given series, features from previous screens were displayed. GfK's graphics capabilities were employed because they allowed new choice features to appear on the screen while information that had appeared on previous screens was displayed in muted text. The within-survey completion rate was 81%, and the survey data were delivered for analysis to the principal investigators 23 days after the survey was fielded.
Project Outcomes: These data are part of the input to a willingness-to-pay (WTP), contingent valuation model developed by Prof. W. Kip Viscusi of the Harvard Law School. This model estimates the per unit valuation of increased variables in water resource quality, such as fewer chemicals, better oxygenation, fewer pollutants, etc.

Harvard University: USDA Food Borne Risk Survey
Client: Harvard University
Funded by: USDA
Period of Performance: March 2004 to June 2004
Project Description: This project developed and tested methods for valuing reductions in food-borne risk associated with bacterial pathogens. Willingness-to-pay (WTP) was elicited to reduce risks of morbidity that vary in duration and severity, and in the conditional mortality risk. Each respondent was asked about two different risks. In each case, the variables that differed were food, morbidity, symptoms, duration, and mortality. These attributes were randomly assigned so that each of the 162 (2×3^4) combinations was asked of some respondents, but no respondent answered more than one question about any single level of any of these five attributes. If the respondent had a child, the second question asked about a risk to the child; otherwise, the question was about a risk to the respondent. The last part of the survey had questions about food-handling practices, and the standard package of demographics from the panel profile database was attached for each record. This project consisted of a 400 case pilot survey and a 2,000 case main survey.
Project Outcomes: These data are part of the willingness-to-pay (WTP) research at the Harvard Center for Risk Analysis (HCRA) under the direction of Prof. James Hammitt. This center studies a variety of health risk behaviors and outcomes funded by a variety of government agencies. This project combines WTP analyses with actual behaviors about food handling. Ultimately, these data will find their way into the policy formation literature.

University of California Los Angeles: EPA Valuation Project titled "Not All Deaths Are Created Equal" (EPA Grant #446456-JS-22859)
Client: UCLA
Funded by: EPA
Period of Performance: September 2002 to November 2002
Project Description: This project consisted of asking respondents in the U.S. and Canada about their "valuation" of various ways of dying and the associated costs and risks for each outcome. This is a complex conjoint design and analysis that required respondents to view the choice alternatives and attributes of each outcome. There were six distinct operational phases.

- Phase 1: The questionnaire was programmed and tested, with full quality assurance. The design was a complex conjoint design with random sorting of attributes. Revisions were made after each laboratory test and the Canadian pretest.
- Phase 2: GfK conducted cognitive interviews in a laboratory with 40 research subjects for the cognitive interviews and provided the laboratory for the interviews. In total there were 4 days of cognitive interviews, with 10 interviews per laboratory day.
- Phase 3: After the cognitive interviews were completed, GfK pre-tested the questionnaire with a Canadian email sample for a total of 1,000 completed interviews. These data included the Standard Geographical Classification (SGC) codes linked to statistical information from the Canadian census.
- Phase 4: For the main study, information packets were prepared, produced, and mailed to the GfK panel members sampled for the study. Each packet consisted of two pages of visuals aides. UCLA provided the content for the packet. This packet was provided to respondents given the complex nature of the conjoint choice sets.
- Phase 5: The main study interview of 4,400 KnowledgePanel members consisted of a 20-minute interview and included respondent incentives. There was a "field check" after the first 200 cases to determine that the conjoint programming was correct and that there were no systematic patterns in the randomization.
- Phase 6: This was a 10-minute interview of approximately 1,000 parents and legal guardians of minors. These parental respondents had completed the questionnaire in the main study.

GfK provided basic demographic profile data on nonresponding households with the final data file as well as 25 demographic and social context variables and a set of health profile data.
Project Outcomes: This project continues the line of research on stated preference analysis that DeShazo and Cameron have pursued. (See DeShazo, J.R. and G. Fermo (2002), "Designing Choice Sets for Stated Preference Methods: The Effects of Complexity on Choice Consistency," *Journal of Environmental Economics and Management*. 43(3):360-385. [This study was identified as one of three of the most influential articles of the year at the 2002 World Congress by Ian Bateman, Editor of *Environmental and Resource Economics*.]).

Resources for the Future: Surveys in Support of Valuation of Regional Ecological Risk Response to Acidification and Techniques for Transferring Estimates
Funded by: Environmental Protection Agency
Period of Performance: Fall 2006 to Winter 2009
Project Description: The research was anchored to the team's recently completed contingent valuation (CV) study, also conducted with GfK, of the total value of ecological improvements from reduced acidification in

the Adirondacks. This study employs a choice experiment (CE) survey in the Adirondacks and both a CV and a CE survey in the Southern Appalachian Mountain region. This research provides estimates of willingness to pay for ecological changes resulting from reduced acidification in the Adirondack Park and Southern Appalachian region on a geographic and temporal scale that would be expected to result from current legislative or regulatory proposals.

Descriptions of GfK Staff

The key staff responsible for government, academic, and non-profit research each have had long careers in designing and conducting surveys sponsored by the Federal Government and major universities. The staff has also participated in methodological research on data collection mode effects, nonresponse bias, and panel effects.

Members of GfK's Government & Academic Research will conduct the research for this study. Below are brief descriptions of the key staff and their respective disciplines.

Joseph K. Garrett
Senior Vice President, Government and Academic Research

Joe Garrett is a Senior Vice President in GfK's Government & Academic Research group. Located in Washington, D.C., he works with federal agencies and Washington-based policy organizations and universities. He came to GfK from Market Strategies International, where he founded and led the Government, Foundation, and Academic Research Division. Mr. Garrett's career spans 30 years; from 1997 to 2004, he was Vice President and Deputy Director of Surveys and Information Services at Mathematica Policy Research, a leading social policy research firm. For seven years prior to that, Mr. Garrett served ACNielsen as Vice President and Chief Statistical Officer. He began his career at the Census Bureau in 1978, where he rose to the level of Assistant Division Chief, Research and Methodology.

Since 1988, Mr. Garrett also has been Adjunct Professor in the Department of Statistics at George Washington University. He also has served as an adjunct faculty member at the Joint Program in Survey Methodology at the University of Maryland. Bringing depth of experience in research, his expertise includes sample design, estimation, survey methods, and survey operations. Mr. Garrett has published numerous papers and articles on statistical methods and survey research techniques. In addition, he has chaired or served on the advisory committees of the American Statistical Association, American Economic Association, American Marketing Association, and the Population Association of America. Currently, Mr. Garrett belongs to the Board of Directors of the Council of Professional Associations on Federal Statistics. Mr. Garrett received a B.S. in Mathematics and a M.S. in Mathematical Statistics, both from Miami University.

Wendy Mansfield, Ph.D.
Senior Vice President, Research Development

Wendy Mansfield, located in Washington, DC, joined GfK in March, 2009 as Vice President, Research Development. She comes to GfK following almost 10 years at Mathematica Policy Research, Inc., where she was Associate Director of the Washington, DC, Survey Research Department. She directed large- and small-scale studies using a variety of data modes, ensuring that projects were completed on schedule and within budget. She is experienced in all phases of survey projects, including designing studies, developing surveys, and obtaining clearance from the Office of Management and Budget and approval from institutional review boards. Dr. Mansfield has worked primarily on education projects and secondarily on international, community service, Census, HUD, Treasury, BIA, and CPB projects, and she has helped to develop business with a variety of agencies.

Dr. Mansfield will join the other Government & Academic Research team members in developing GfK's research portfolio with federal agencies and institutions. She brings nearly 20 years of experience working on government contracts. She previously was a staff member of Westat, Macro International, and Pricewaterhouse. She received degrees from the University of Pennsylvania (Ph.D., Communications) and the University of Virginia (B.A., English).

Michael S. Lawrence
Vice President, Research Development

Mike Lawrence is a Vice President for Research Development in GfK's Government & Academic Research group. He is located in the Washington, DC, area. Mr. Lawrence comes to GfK from RTI (RTI International) where worked as Associate Director of the Research Development Office since 2002. He was responsible for both business development and program management for Government and Commercial clients. Mr. Lawrence's primary responsibility was for work in Energy (governmental and private), Homeland Security (governmental), Defense (governmental), Health Insurance Portability and Accountability Act (HIPAA) compliance (commercial), and statistical analysis (commercial).

Mr. Lawrence will be working with Government & Academic Research to expand GfK's presence in the DC area and in government markets. During his 30 years of broad experience, he has managed dozens of government and private sector contracts. He previously worked for a number of Washington, DC, area research firms and the U.S. Department of Energy. He is a graduate of Michigan State University (M.A., Family and Child Sciences) and the State University of New York at Stony Brook (B.A., Sociology).

Mansour Fahimi
Senior Vice President, Chief Statistician

With 25 years of experience in survey and market research methods and applications, Mansour Fahimi works on design and administration of complex surveys. He is keenly familiar with sampling techniques and has years of experience with post-survey procedures including nonresponse bias analysis, imputation of missing data, computation of survey weights, and methods for variance estimation. Mansour has extensive experience with data analysis involving multivariate techniques, time series, nonparametric methods, experimental designs, as well as procedures for analysis of data from complex surveys. As a leading researcher in the areas of dual-frame RDD and address-based sampling methodologies he has been working on refinements for improving the efficiency of these methods by minimizing undercoverage and inconsistent practices for sampling and weighting applications.

Sergei Rodkin, Ph.D.
Vice President

Sergei Rodkin is responsible for technical design in survey projects, managing survey projects, and assuring quality deliverables in Government & Academic Research. Dr. Rodkin also manages KnowledgePanel/QuickView, an omnibus survey solution for social science and public policy researchers. He has extensive experience in survey methodology, questionnaire design, and project management. Prior to joining GfK in 2005, Dr. Rodkin was a Survey Director at Abt Associates (2000–

2005) where he worked on several large scale projects as part of the State and Local Area Integrated Telephone Survey (SLAITS). Dr. Rodkin began his survey research career at the Senator Alan Bible Center for Applied Research at the University of Nevada, Reno. Dr. Rodkin received his B.A. in psychology from Hendrix College and Ph.D. in social psychology from University of Nevada, Reno.

Larry Osborn
Vice President

Larry Osborn was the project manager for a new NSF-funded ANES Web panel created for Stanford University and the University of Michigan. This new panel was designed specifically to meet the requirements of government and academic research. His responsibilities include management of telephone recruitment of panel members, development and oversight of panel survey processes, data delivery, and report production. Prior to joining GfK, Mr. Osborn was a Senior Survey Director at Abt Associates (1999–2007), managing complex, large-scale survey projects for clients including the Centers for Disease Control and Prevention, the National Center for Health Statistics, the Environmental Protection Agency, the National Cancer Institute, and the Department of Veterans Affairs. His areas of expertise include questionnaire design, sample design and management, interviewer recruitment and training, report writing, and timely delivery of client data. Mr. Osborn has his M.P.H. from the University of Alabama.

Stefan Subias
Senior Research Director

Stefan Subias is a Project Director in the Government & Academic area of GfK. He is involved in overseeing all stages of survey projects including survey design, programming, sampling, quality assurance, and project management. Mr. Subias has worked on studies for a variety of organizations including Stanford University, Massachusetts Institute of Technology, the Gallup Organization, and the Research Triangle Institute as well as federally funded projects for NSF, CDC, and USDA. Mr. Subias received his B.S in Business Administration from the University of Southern California.

Poom Nukulkij
Senior Research Director

Poom Nukulkij is responsible for managing online projects for Government & Academic Research from our Chicago office. He is involved in all phases of the research process, including coordinating with the Operations Department on survey sampling, questionnaire design and programming, and quality control as well as data preparation and report writing. He has successfully managed research projects for the NSF-funded Timesharing Experiments for the Social Sciences (TESS), Harvard University, and CBS News. Prior to joining Government & Academic Research, he served as GfK's Profile Data specialist. Mr. Nukulkij studied peer aggression and victimization at the University of Connecticut, earning his M.A. in Developmental Psychology with an emphasis on questionnaire design and research methodology. He is trained in longitudinal and cross-sectional research techniques and has extensive experience managing studies of young children and early teens.

References

See the GfK bibliography located at www.knowledgenetworks.com/ganp for more references and for more articles and papers, please visit http://www.knowledgenetworks.com/ganp/reviewer-info.html.

Baker, Laurence C., M. Kate Bundorf, Sara Singer, and Todd H. Wagner. 2003. Validity of the Survey of Health and the Internet, and Knowledge Network's Panel and Sampling. Stanford, CA, Stanford University, 2003. Available from http://www.knowledgenetworks.com/ganp/reviewer-info.html.

Baker, Laurence, Todd H. Wagner, Sara Singer, and M. Kate Bundorf. 2003. Use of the Internet and Email for Health Care Information: Results from a National Survey. *Journal of the American Medical Association*. 289:2400-2406.

Blumberg, S. J., Luke, J. V. 2007. Coverage Bias in Traditional Telephone Surveys of Low-Income and Young Adults. *Public Opinion Quarterly* Vol. 71 (5), 734-749.

Cameron, Trudy A. and J.R. DeShazo. 2008. The Knowledge Networks Panel and Sample Selection Corrections. See the full paper and technical appendix available at http://www.uoregon.edu/~cameron/vita/wpabstracts.htm.

Clinton, Joshua D. and John S. Lapinski. 2001. Testing Television Advertising Using Interactive Television: The Effectiveness of Political Advertisements. Presented at the February 2001 NetEffects4 Conference of ESOMAR.

Couper, Mick P. 2000. Web Surveys: A Review of Issues and Approaches. *Public Opinion Quarterly* 64: 464-494.

Dennis, J. M., C. Chatt, R. Li, A. Motta-Stanko, and P. Pulliam. 2005. Data Collection Mode Effects Controlling for Sample Origins in a Panel Survey: Telephone versus Internet. Paper presented at the 2005 Annual Meeting of the American Association for Public Opinion Research. Available at http://www.knowledgenetworks.com/ganp/rtimode.html.

Dennis, J. Michael, Larry Osborn, and Karen Semans. March 2009. Comparison Study of Early Adopter Attitudes and Online Behavior in Probability and Non-Probability Web Panels. Available at http://www.knowledgenetworks.com/ganp/reviewer-info.html.

Dennis, J. Michael. 2001. Are Internet Panels Creating Professional Respondents? The Benefits of Online Panels Far Outweigh the Potential for Panel Effects. *Marketing Research*, Summer: 34-38.

Dennis, J.M. and R. Li. 2007. More Honest Answers to Surveys? A Study of Data Collection Mode Effects. *Interactive Marketing Research Organization's (IMRO) Journal of Online Research*. Available at http://www.knowledgenetworks.com/ganp/reviewer-info.html.

DiSogra, Charles, Mario Callegaro, and Erlina Hendarwan. 2009. Recruiting Probability-based Web Panel Members using an Address-based Sample Frame: Results from a Pilot Study Conducted by Knowledge Networks. Presented at the 2009 Joint Statistical Meetings. Available at http://www.knowledgenetworks.com/ganp/reviewer-info.html.

Harris, Katherine, M. 2002. Can High Quality Overcome Consumer Resistance to estricted Provider Access? Evidence from a Health Plan Choice Experiment. *Health Services Research*, 37:551-571.

Heeren Timothy; Edwards Erika M; Dennis J Michael; Rodkin Sergei; Hingson Ralph W; Rosenbloom David L. "A Comparison of Results From an Alcohol Survey of a Prerecruited Internet Panel and the National Epidemiologic Survey on Alcohol and Related Conditions". *Alcoholism: Clinical and Experimental Research* 2008;32(2):222-9.

Huber, Joel, W. Kip Viscusi, and Jason Bell. 2004. The Value of Regional Water Improvements: Further Evidence. Presented at the October 2004 EPA Conference on Valuation of Ecological Benefits.

Keeter, S., Kennedy, C., Clark, A., Tompson, T., & Mokrzycki, M. 2007. What's Missing from National Landline RDD Surveys? The Impact of the Growing Cell-Only Population. *Public Opinion Quarterly* Vol. 71 (5), 772-792.

Krosnick, Jon A., and LinChiat Chang. 2001. A Comparison of the Random Digit Dialing Telephone Survey Methodology with Internet Survey Methodology as Implemented by Knowledge Networks and Harris Interactive. Presented at the May 2001 Conference of the American Association for Public Opinion Research.

Krotki, Karol and Dennis, J. Michael. 2001. Probability-based Survey Research on the Internet. Presented at the August 2001 Conference of the International Statistical Institute.

Lentine, D.A., J.C. Hersey, V.G. Iannacchione, G.H. Laird, K. McClamroch, L. Thalji, the Prevention Informatics Office, and the Center for Disease Control and Prevention, 2000. HIV-Related Knowledge & Stigma - U.S. 2000. *Morbidity & Mortality Weekly Report*, 12/01/2000: 49(47);1062-64. Available on the World Wide Web: http://www.cdc.gov/mmwr/PDF/wk/mm4947.pdf

Martin, Elizabeth, Jane Junn, and Daniel Slotwiner, 2000. Opportunities and Limitations of Web-Based Surveys of Advertising Exposure: A Methodological Perspective. Presented at the 2000 Conference of the American Association for Public Opinion Research.

Piette, John D., Michele Heisler, and Todd H. Wagner. 2004. Problems Paying Out-of-Pocket Medication Costs Among Older Adults with Diabetes. *Diabetes Care*, 27:384-391.

Schlenger, William E., Juesta M. Caddell, Lori Ebert, B. Kathleen Jordan, Kathryn M. Rourke, David Wilson, Lisa Thalji, J. Michael Dennis, John A. Fairbank, Richard A. Kulka. 2002. Psychological Reactions to Terrorist Attacks: Findings from the National Study of Americans' Reactions to September 11. *Journal of the American Medical Association*, 288(5): 1235-1244.

Silver, R. C., E. A. Holman, D. N. McIntosh, M. Poulin and V. Gil-Rivas. 2002. Nationwide Longitudinal Study of Psychological Responses to September 11. *Journal of the American Medical Association*, 288(10): 1235-1244.

Skitka, L. J., and E. Mullen, 2002. Understanding Judgments of Fairness in a Real-world Political Context: A Test of the Value Protection Model of Justice Reasoning. *Personality and Social Psychology Bulletin*. Skitka, L. J., E. Mullen, T. Griffin, S. Hutchinson, and B. Chamberlin, 2002. Dispositions, Ideological Scripts, or Motivated Correction?: Understanding Ideological Differences in Attributions for Social Problems. *Journal of Personality and Social Psychology*.

Smith, Tom W., and J. M. Dennis. December 2005. Online versus In-Person: Experiments with Mode, Format, and Question Wordings. Public Opinion Pros. Available under "Past Issues" at http://www.publicopinionpros.norc.org/index.asp.

Viscusi, W. Kip, Huber, Joel C. and Bell, Jason. 2004. The Value of Regional Water Quality Improvements. Harvard Law and Economics Discussion Paper No. 477.

Wiebe, Elizabeth, Joe Eyerman, and John D. Loft. 2001. "Evaluating Non-Response in a Web-Enabled Survey on Health and Aging." Presented at the May 2001 Conference of the American Association for Public Opinion Research. Manuscript from personal communication with the author.

Yeager, David, Jon Krosnick, LinChiat Chang, Harold Javitz, Matthew Levindusky, Alberto Simpser, and Rui Wang. August 2009. Comparing the Accuracy of RDD Telephone Surveys and Internet Surveys Conducted with Probability and Non-Probability Samples,. Available at http://communication.stanford.edu/faculty/krosnick/.

Zukin, Cliff, S. Keeter, M. Andolina, and K. Jenkins. 2002. "Measuring Civic Engagement." Presented at the May 2002 Conference of the American Association for Public Opinion Research.