Chapter 11

FREEWAY SERVICE PATROLS

A Stated Preference Analysis of Insurance Values

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In this chapter, a Stated Preference (SP) analysis was carried out to identify the factors that influence people to choose highway assistance services (FSP) over private assistance services (PAS). The Los-Angeles FSP was used as a test case and the B/C ratios were also calculated based on the utility the FSP provides to an individual. Different values were chosen for the average time of waiting of the FSP and the B/C ratios were calculated in each case. The results indicate that the probability of an individual choosing the highway assistance services depends on the attributes of the program like the time of waiting for assistance and cost of waiting for assistance. The B/C ratios for the Los Angeles FSP were in the range 6.2–6.3.

1. INTRODUCTION

Highway assistance services, also called highway helpers, freeway service patrols (FSPs), and a variety of other names, are one of the main approaches used by incident management programs. The main goals of Freeway Service Patrols are to identify incident locations, reduce incident duration time, restore full freeway capacity, and reduce the risks of secondary accidents to motorists (Fenno and Ogden, 1998). These programs use vehicles to patrol heavily traveled segments and congested sections of the freeways that are prone to incidents (MnDOT, 2000). The role of the patrols is to clear the majority of incidents without any assistance from the other agencies. During

major incidents, the patrols help assess the equipment and manpower needed to clear the incidents, coordinate with the other agencies involved, provide the needed traffic control, and act as a buffer between the workers and traffic. They also help detect and verify incidents like major accidents and pass on the required information to the transportation management centers (TMCs). This helps reduce delay, congestion, wasted fuel, emissions, and potential for secondary accidents.

The goal of this paper is to determine the value that people place on the benefits offered by freeway service patrols in comparison to private assistance services. This is done by estimating how much they would be willing to pay to avoid being stranded when their vehicles break down on the freeway. The factors that contribute to people choosing to rely on the highway assistance services in comparison to the private assistance services are investigated. In addition, the effectiveness of freeway service patrol for their insurance value only was analyzed using a benefit-cost analysis. A range of values was tested for the average time of waiting of the freeway service patrol and benefit-cost ratios were calculated for each.

The first part of the paper reviews studies that have been carried out on FSP programs. The second section outlines the theory of value that is used in this paper. The next part of the paper details the methodology of the stated preference analysis. Hypotheses about the study are put forth and the choice model results discussed. The subsequent section estimates a cost model, applies it to the Los Angeles freeway service patrol. The estimates of benefits from the choice model are presented. The final section calculates benefit-cost ratios based on the value users place on having the service available.

2. BACKGROUND

The first service patrol was started in the early 1900s. Early patrols were positioned at locations where incidents were expected to have a major impact on the traffic flow. The first patrol that was operated on a regular basis was the Chicago Emergency Traffic Patrol (ETP) in 1960.

The patrols are generally sponsored by public agencies but sometimes involve a combination of agencies and private organizations. Most of the funding comes from State Departments of Transportation (DOTs), local and state police, and metropolitan transportation agencies. Private towing companies are contracted to provide the patrols and supply the required vehicles, trained drivers, and equipment.

Patrols vary greatly in their temporal and spatial extent, as well as the frequency of coverage. The timespan may be 24 hours, daytime, peak period, or peak hour. The frequencies of the patrols range between one vehicle every 10 minutes to one vehicle every hour and is usually decided based on a trade-off between the area of coverage and intensity of coverage. The network coverage can be focused or broad. Patrols use a variety of vehicles including

pickup trucks, vans, tows, trucks, cars, and utility vehicles. Certain patrols have special on-call support vehicles like changeable message signs (CMS) trailers, crash-cushion trailers, dump trucks, and sanders. The primary goal of these patrols is to remove the vehicles stalled in the freeway routes. Other services include changing flat tires, providing a needed gallon of gasoline, moving the vehicle to a safe location away from traffic, jump-starting a battery, or duct taping a hose.

In addition to the public highway assistance services like the freeway service patrols, there are also private emergency services, often operated by auto clubs, which provide similar services. These offer services to stranded motorists who are members of their club. The largest auto club is the Automobile Association of America (AAA). AAA is a non-profit federation of 90 motor clubs with offices in the United States and Canada, originally formed by nine motor clubs in Chicago in 1902.

California PATH (Partners for Advanced Transit and Highways) undertook two studies that evaluated the effectiveness of freeway service patrols in California. The first study (Skabardonis et al., 1995) evaluated the effectiveness of the freeway service patrols operating on a 7.8-mile test section of the I-10 (Beat 8) freeway in Los Angeles. The evaluation methodology estimated the incident delays before and after the freeway service patrols were introduced in that test section. The benefit-cost ratio was calculated using the delays and fuel savings due to reductions in incident duration and was found to be greater than 5:1 for reduction in duration of about 15 minutes. The results of the study showed that introduction of the freeway service patrol in the test section increased the number of incidents assisted and reduced the detection and response time of the incidents.

The second examined a San Francisco Bay Area freeway section (Skabardonis et al, 1998). Two hundred and seventy-six hours of "before" and "after" data were collected and processed for the section. The study found that, based on the savings in incident delay and fuel consumption, the introduction of the freeway service patrol was cost-effective at the test site.

A study carried out by the Texas Transportation Institute (Fenno and Ogden, 1998) showed that these patrols have a high benefit-to-cost ratio that varied from 2:1 to over 36:1. The patrols have become highly popular among the motorists and have proved to be very effective in aiding in the removal of congestion causing accidents.

The studies conducted so far have focused on the effectiveness or economic efficiency of the freeway service patrol. In the benefit-cost analysis the benefits have been measured as savings in expenses rather than consumer valuations of the service. Our study makes a contribution in two ways. First, it analyzes the factors that influence people in choosing to rely on the freeway service patrol vs. an auto club and also the benefits to an individual due to the presence of the freeway service patrol. Second, it develops measures of

consumer valuations of the freeway patrol service and therefore provides the basis for accurate benefit measurement.

3. INSURANCE VALUE

A good or service is comprised of both Use value and Non-Use values. The total value of a good, from an individual's perspective, is the summation of both these values and is a function of the psychological, moral, ethical, and altruistic satisfaction obtained from the good.

Use value (or active value) is defined as the value an individual obtains from actually using the good or service. Non-use value (or passive value) is the value that an individual places on something although he does not intend to use it. Non-Use value is comprised of the following categories:

1) Existence value is the value obtained by an individual from the knowledge that a good exists (or is protected as in the case of an important resource).
2) Vicarious value is the value than an individual obtains from the indirect consumption of a resource.
3) Option value is the value that an individual obtains from having an option to enjoy the resource later.
4) Quasi-option value is the opportunity value that an individual obtains by delaying a decision that may result in irreversible losses otherwise.
5) Bequest value is the value that an individual in the current generation gets from preserving the good for the use of future generations.

The insurance value of a good is much like an option value. By paying for insurance, you are allowing the option of enjoying the insurance coverage at a later time. An auto club membership can be considered as insurance for individuals against being stranded on a freeway when their vehicles break down.[1] Breakdown insurance is simply a pooling of risks; the subscriber pays a small fee, and most of the time loses money (by not actually taking advantage of the service), but on occasion gets a large reward (by having the service available when needed).

Freeway service patrols are in many respects a public version of that component of the auto club service dealing with roadside assistance. The pooling of risk is done through tax dollars, and so all motorists are members. While the traditional private auto club limits its service to members, it may provide a positive network externality by clearing incidents faster than in its absence. Freeway service patrols are justified on the basis of this positive network benefit, but also provide the private benefit of aiding the broken down vehicle in addition to helping traffic flow better. Our study aims to measure this private "insurance" benefit, to complement the public benefit that has previously been measured by Fenno and Ogden (1998) and Skabardonis et al. (1995 and 1998).

4. METHODOLOGY

A stated preference survey questionnaire was developed at the University of Minnesota, Minneapolis to find the value of the highway assistance services. The pilot survey was carried out on a sample of 16 individuals, mostly college students at the University of Minnesota, Minneapolis in spring 2000. After this pilot study, a revised Internet-based survey was carried out at UC-Berkeley and at UC-San Diego with a sample size of 1,008 (Gillen et al. 2001).[2]

The survey was designed to provide measures of how people value the range of service both temporally as well as geographically and the type of service offered. The three key categories of service were when it was offered, where it was offered and the quality of service that was offered. The conjoint model was used to elicit responses to measure willingness to pay. The survey instrument is given in Appendix 1.

An analysis of the data from the Internet-based survey was carried out using the logit model. The aim of the analysis was to estimate the probability of an individual choosing a set of characteristics associated with the highway assistance services given certain breakdown related characteristics and individual characteristics.

5. HYPOTHESIS AND RESULTS: PRIVATE VS. PUBLIC HIGHWAY ASSISTANCE SERVICES

The survey consisted of series of questions in which the respondents had to choose between characteristics representative of (1) freeway service patrols (FSP) and (2) private assistance services (PAS).

The hypothesis was that the probability of an individual choosing the public assistance services or alternative (1) compared to alternative (2) is a function of the difference in the time of waiting between the alternatives (1–2), difference in the cost of assistance between alternatives (1–2), time of breakdown on the freeway (morning/evening/night), and the socio-demographic characteristics: age, sex, income, auto age, maintenance expenses, commute to work, cell phone ownership, and towing coverage.

Individuals choosing alternative (1) were coded as one and individuals choosing alternative (2) were coded as zero. Dummies were used for sex, cell phone ownership, and towing coverage ownership.

The results show that the probability of an individual choosing alternative (1) decreases with an increase in the time of waiting between the alternatives and an increase in the cost of assistance. Also it is seen that men are more likely to choose alternative (1) rather than alternative (2). Women more strongly favor a briefer wait than men. The results of the binary logit model are given in Table 1. All the variables considered are significant and influence the choice probabilities.

Table 1. Freeway Service Patrol Choice Model

Choice of Relying on Freeway Service Patrol

Logit estimates — Number of obs = 9728
LR chi2(12) = 1511.04
Prob > chi2 = 0.0000
Log likelihood = -5983.0931 — Pseudo R2 = 0.1121

Variable	Coefficient	Std. Error	z	P>|z|
ΔTime waiting*	-0.033	0.016	-2.110	0.035
ΔCost *	-0.048	0.00423	-11.410	0.000
Sex* (Male=1)	0.292	0.046	6.380	0.000
Age*	-0.010	0.002	-5.390	0.000
Income*	-8.70e-06	9.71e-07	-8.960	0.000
Autoage*	0.016	0.004	4.050	0.000
Maintenance expenses*	-1.76e-04	5.46e-05	-3.220	0.001
Commute*	0.014	0.002	6.550	0.000
Cell phone* (Own=1)	-0.118	0.048	-2.470	0.013
Towing coverage*	0.128	0.065	1.950	0.051
Morning time*	1.230	0.055	22.480	0.000
Evening time*	1.251	0.055	22.830	0.000
_cons	-0.616	0.197	-3.130	0.002

* Indicates significance at 95 percent confidence level

The age and income variables show that as the age and income of individuals increase they are less likely to opt for the public assistance services. This indicates that older and higher income individuals would prefer a shorter wait even at a higher price.

The commute variable, which refers to the length of an individual's commute to work in miles, is significant and contributes positively to the individual choosing the public assistance services. Further an individual owning a cell phone is less likely to choose to rely on public assistance services. The time of day dummies indicate that compared to midnight, individuals stranded on the freeway in the morning or evening would prefer the public assistance services.

Surprisingly, individuals having towing coverage are more likely to wait for the public assistance services. This can perhaps be explained by the risk-averse nature of some individuals who not only are members of auto club but also prefer government provided highway assistance service. This suggests that public and private assistance services serve as complements to risk-averse individuals rather than substitutes. This makes sense when one considers that private coverage is broader in both time and space than public assistance offered by freeway patrol services.

The analysis shows that the probability of an individual choosing the public assistance services depends on the attributes of the program like the time of waiting and the cost of assistance. The heterogeneity of the sampled

group and larger sample size has helped indicate the importance of socio-demographic characteristics compared with our initial pilot study.

6. COST ANALYSIS

The cost model used here was developed using data for highway assistance services operating in the various states (Fenno and Ogden, 1998), shown in Table 2. The data contained the name and location of the patrol, centerline kilometers, number of routes and vehicles for each patrol, the year the patrol was started, the annual incidents, the weekday hours of operation, sponsorship and funding agencies for the patrols. The population data were obtained to be consistent with the program areas. (Bureau of the Census, 1999; Negative Population Growth, 2000; Northern Indiana Regional Planning Commission 2000; California Department of Finance, 2000).

The independent variables considered to affect the cost of the program are the number of vehicles used by the patrol, number of routes that the patrol operates, and the population of the area in which the program operates. The annual budget of the patrol is taken to be the dependent variable.

A simple OLS regression, reported in Table 3, reveals whether the variables considered are significant. The results indicate that the variables considered are significant and influence the annual cost of the program. The annual cost of the program increases with the number of vehicles and number of routes that the program operates, that is, the size of the program. The incremental cost of adding routes is larger than that of adding vehicles. As population coverage increases, the incremental cost goes down, this can be viewed in some respects as the effect of density.

The Los Angeles FSP was used as a test case for the cost analysis. The data for the Los Angeles FSP were used in the cost model developed to get the annual cost of the program. The Los Angeles FSP operates on 41 routes and uses 150 vehicles. The model shown in Table 3 predicts the total cost of operation of the Los Angeles FSP is $18,687,338, consistent with the $20,000,000 estimate obtained by Fenno and Ogden (1998).

7. BENEFIT ANALYSIS

The logit model developed in the survey analysis is used for the benefit analysis. The analysis considers two scenarios. The "before" scenario has just the private assistance service operating. The "after" scenario has both the PAS and FSP operating in the area.

The PAS was assumed to have a constant average wait time and cost of assistance in both the "before" and "after" scenarios while the FSP average wait time was varied.

The assumptions used here are:

a) The average wait time for the PAS was assumed to be one hour in both the "before" and "after" scenarios
b) The average cost of assistance for the PAS was assumed to be $25 in both the "before" and "after: scenarios

The utility of a particular alternative to an individual was considered to be a function of the average time of waiting of the alternative, average cost of assistance of the alternative and other related socio-demographic characteristic. The utility for the "after" and "before" scenarios were calculated as given below:

$$V_{After} = V_{PAS} + V_{FSP}$$

$$V_{Befire} = V_{PAS} + V_{NoFSP}$$

V_{After} is the utility to an individual in the "after" scenario

V_{Befire} is the utility to an individual in the "before" scenario

V_{PAS} is the utility of the PAS alternative to an individual

V_{FSP} is the utility of the FSP alternative to an individual

V_{NoFSP} is the utility of the No FSP alternative to an individual

Table 2. Freeway Service Patrol Data

Patrol Location	Patrol Name	Hours	Annual Incidents	Annual Budgets	Year Started	Centerline Kilometers	Number routes	Number Vehicles
Albany ,NY	Samaritan	6	8200	NA	1983	NA	2	12
Atlanta,GA	Highway Emergency Response	16.5	16900	400000	1995	105	5	12
Austin,TX	Courtesy Patrol	16	NA	350000	1996	48	2	3
Boston,MA	Motorist Assistance Patrol Samaritan	6	72000	NA	1994	NA	16	16
Charlotte,NC	Incident Management Assistance Patrol	16	12000	410000	1990	26	1	6
Chicago,IL	Emergency Traffic Patrol	24	100000	3500000	1960	127	12	56
Cincinnati,OH	Samaritan	6	18200	NA	1992	NA	3	3
Columbia,SC	State Highway Emergency Patrol	4	4200	200000	1996	32	2	3
Dallas,TX	Courtesy Patrol	16	20000	750000	1987	564	7	17
Denver ,CO	Mile High Courtesy Patrol	5.5	18000	700000	1992	61	5	10
Detroit,MI	Freeway Courtesy Patrol	10	7080	NA	1994	68	4	5
El Paso,TX	Courtesy Patrol	15	18000	186000	1993	31	2	6
Fresno,CA	Freeway Service Patrol	4	1650	241600	1993	35	2	2
Ft.Lauderdale,FL	I-95 Service Patrol	13	24000	1000000	1995	81	6	7
FT.Worth,TX	Courtesy Patrol	24	10200	400000	1973	338	3	7
Greeley,CO	State Patrol Coutesy Patrol	7	NA	30000	1996	19	1	2
Greensboro,NC	Incident Management Assistance Patrol	16	3800	283000	1993	39	3	4
Greenville,SC	State Highway Emergency Patrol	4	NA	165000	1996	48	2	3
Haywod Co.,NC	Incident Management Assistance Patrol	24	4500	180000	1969	32	1	2
Houston,TX	Motorist Assistance Program	16	33500	1400000	1986	270	9	16
Indianapolis,IN	Samaritan	6	3800	NA	1991	NA	1	1
Kansas City.,MO	Motorist Assist.	13	40000	20000	1992	97	2	4
LosAngeles,CA	Metro Freeway Service Patrol	8	250000	20000000	1991	650	41	150
Miami,FL	I-95 Service Patrol	13	NA	400000	1997	27	4	4
Minneapolis,MN	Highway Helper	16	11000	610000	1987	145	7	8
New Jersey,NJ	Courtesy Patrol	8	3580	115000	1989	81	3	5
NeW York,NY	Highway Emergency Local Patrol	8	23570	2905000	1990	217	7	21
Norfolk,VA	Safety Service Patrol	24	12000	700000	1992	31	2	6
Northwestern IN	Hoosier Helper	24	13375	NA	1991	26	1	3
Oakland,CA	Freeway Service Patrol	7	97000	6000000	1991	354	20	51
Orange Co., CA	Freeway Service Patrol	7.5	80000	2000000	1992	145	10	30
Philadelphia,PA	Incident Management team	24	NA	NA	1989	815	20	15
Pittsburg,PA	Penn Licoln Parkaway Patrol	6	6000	245000	1996	42	3	4
Providence,RI	Samaritan	6	4400	NA	1978	NA	1	1
Raleigh,NC	Incident Management Assistance Patrol	14	8500	237000	1993	48	2	4
Richmond ,VA	Motorist Assistance Program	15	64500	1075000	1989	NA	NA	7
Riverside Co.,CA	Freeway Service Patrol	6	16000	700000	1993	40	4	8
Sacremento,CA	Freeway Service Patrol	6.5	11700	NA	1992	82	4	8
San Antonio,TX	Courtesy Patrol	24	6250	475000	1978	229	6	4
San Diego,CA	Freeway Service Patrol	6.5	18500	2000000	1993	250	7	7
Southern Connecticut	Samaritan	6.5	4800	NA	1985	NA	1	1
Springfield,MA	Motorist Assistance Patrol Samaritan	6	72000	NA	1995	NA	1	1
St.Louis,MO	Motorist Assistance Patrol	16	NA	NA	1993	161	10	14
Tampa,FL	I-4 Service Patrol	14	NA	NA	1996	32	4	7

Source: (Fenno and Ogden, 1998)

Table 3. Freeway Service Patrol Cost Model

Dependent Variable = Budget

Variable	Coefficient	Std. Err	t	P>|t|	Los Angeles Data	Total
Vehicles*	102603	19819	5.17	0.000	150	15,390,450
Routes*	143769	67812	2.12	0.044	41	5,894,561
Population*	-0.588	0.237	-2.48	0.020	3597556	-2,115,170
Constant	-483	221831	-2.17	0.039	1	-482,503
N	30				Total Cost for LA	$18,687,338
Adj. R-square	0.9631					

* Indicates significance at 95 percent confidence level

Using the coefficients obtained in the survey analysis model, the individual utility for both the scenarios was calculated for each of the 1,008 respondents of the survey as given above and then averaged to obtain the average utility. Four different time of waiting of the FSP were chosen and the calculation repeated for each time of waiting of the FSP.

The difference in the utilities was calculated using the log-sum formula given below (6):

$$\text{Logsum} = \frac{1}{m} \ln \sum_{i \in C_n^2} e^{mV_{in}^2} - \frac{1}{m} \ln \sum_{i \in C_n^1} e^{mV_{in}^1}$$

where C_n refers to the choice set

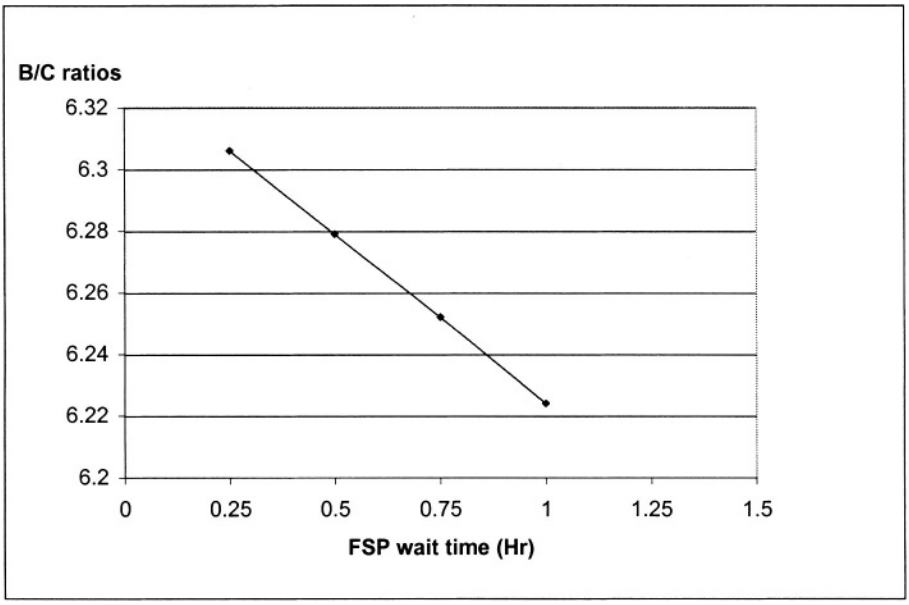
m is a scale parameter

V_{in} is the utility of alternative i to individual n

The superscripts 1 and 2 refer to the "before" and "after" scenarios considered. The scale parameter was taken to be one since the model used is a binary logit model.

The difference in the average utilities for each case was calculated using the above formula. This difference in utilities was divided by the coefficient of travel cost to convert it into monetary terms. The monetized difference was multiplied by the population of Los Angeles, taken as 3,823,000, to calculate the total benefits due to the FSP. The total benefits obtained are divided by the total cost of operation of the Los Angeles FSP obtained in the cost model to obtain benefit cost ratios. The results of the analysis are shown in Figure 1.

Figure 1. Benefit-Cost Analysis



8. CONCLUSIONS

This research has made two important contributions to the ITS literature. First, we have developed an instrument that provides a more accurate measure of the benefits, measured by willingness to pay, attributable to freeway patrol services. Second, we have used our measures to calculate for a representative jurisdiction (Los Angeles) the net benefits of providing freeway patrol services and how these net benefits change as the service level changes. This offers an important tool for decision-makers, as the issue is not simply whether to offer freeway service patrols but how much, where, and how should the service attributes be designed.

We have found that freeway service patrols have value in improving traffic flow and safety by clearing incidents quickly. They also have value for the individuals who are helped by the patrols, who otherwise would have to wait for a private assistance service through their auto club or by calling a tow truck. This study performed a stated preference survey of over 1,000 individuals to ascertain the insurance value of freeway service patrols. The results indicate that freeway service patrols provide insurance benefits for their customers when they save time and money over private assistance services. The benefit-cost ratios decrease as the time of waiting for the FSP increases (freeway service patrols become less competitive).

APPENDIX

This survey is being conducted as part of a research project. The aim of this project is to find out how people look at the benefits and services of highway assistance and the value people place on such programs. The primary focus of highway assistance services is to remove stalled vehicles from the Freeways. The services provide include towing the vehicle to a safe location away from traffic, changing tires, providing a gallon of gas, jumpstarting a battery, etc. These services operate only at certain times and on certain critical routes.

Your participation in this survey will help identify the value of such services. All answers are strictly confidential, and no name identification will be recorded.

Thank you for your participation. Please circle your choices.

1) If your vehicle breaks down on an urban freeway at 7:30 in the morning:
Would you prefer:

a) To be towed by the highway assistance service to a safe location away from the traffic with a waiting time of 15 minutes on the road,

(or)

b) To be towed to the nearest garage or to a place from where you can make arrangements to get your vehicle repaired with a waiting time of 60 minutes on the road.

Circle a or b

2) If your vehicle breaks down on an urban freeway at midnight:
Would you prefer:

a) To be towed by the highway assistance service to a safe location away from the traffic with a waiting time of 20 minutes on the road,

(or)

b) To be towed to the nearest garage or to a place from where you can make arrangements to get your vehicle repaired with a waiting time of 40 minutes on the road.

Circle a or b

3) If your vehicle breaks down on an urban freeway at midnight:
Would you prefer:

a) To wait for 30 minutes on the freeway with your vehicle, paying no cost to get assistance from the highway assistance service,

(or)

b) To wait for 10 minutes and pay $10, for you to get assistance from the highway assistance service.

Circle a or b

4) If your vehicle breaks down on an urban freeway at 7:30 in the morning:
Would you prefer:

a) To wait for 20 minutes on the freeway with your vehicle, paying no cost, for you to get assistance by the highway assistance service,

(or)

b) To wait for 10 minutes and pay $5, for you to get assistance by the highway assistance service.

Circle a or b

5) If your vehicle breaks down on an urban freeway at 7:30 in the morning:
Would you prefer:
a) A highway assistance service that helps to tow the vehicle to a safe location away from traffic, at no cost with a waiting time of 15 minutes,
(or)
b) A highway assistance service that tows the vehicle to the nearest garage or to a place from where you can make arrangements to get your vehicle repaired, with a waiting time of 20 minutes and a cost of $50.
Circle a or b

6) If your vehicle breaks down on an urban freeway at midnight:
Would you prefer:
a) A highway assistance service that helps to tow the vehicle to a safe location away from traffic, at no cost with a waiting time of 15 minutes,
(or)
b) A highway assistance service that tows the vehicle to the nearest garage or to a place from where you can make arrangements to get your vehicle repaired, with a waiting time of 25 minutes and a cost of $30.
Circle a or b

7) If your vehicle breaks down on an urban freeway at 7:30 in the morning:
Would you prefer:
a) A highway assistance service that helps to tow the vehicle to a safe location away from traffic, at no cost, away from the traffic, with a waiting time of 30 minutes,
(or)
b) A highway assistance service that tows the vehicle to the nearest garage or to a place from where you can make arrangements to get your vehicle repaired, with a waiting time of 15 minutes and a cost of $15.
Circle a or b

8) If your vehicle gets a flat tire on an urban freeway at midnight:
Would you prefer:
a) To pay a $50 fee and be assisted in changing the tire,
(or)
b) To pay no fee but to be towed just to a safe location away from the traffic after which you make the necessary arrangements to fix the tire.
Circle a or b

9) If your vehicle gets a flat tire on an urban freeway at 7:30 in the morning:
Would you prefer:
a) To pay a $50 fee and be assisted in changing the tire,
(or)
b) To pay no fee but to be towed just to a safe location away from the traffic after which you make the necessary arrangements to fix the tire.
Circle a or b

10) If your vehicle gets a flat tire on an urban freeway at midnight:
Would you prefer:
a) To pay a $30 fee and be assisted in changing the tire,
(or)
b) To be towed just to a safe location away from the traffic after which you make the necessary arrangements to fix the tire, at no cost.
Circle a or b

11) If your vehicle gets a flat tire on an urban freeway at 7:30 in the morning:
Would you prefer:
a) To pay a $30 fee and be assisted in changing the tire,
(or)
b) To be towed just to a safe location away from the traffic after which you make the necessary arrangements to fix the tire, at no cost.
Circle a or b

As a general user of the roadway:
12) Would you prefer:
a) That you pay an annual fee of $50 for highway assistance services and not pay a fee if the vehicle actually breaks down on the freeway,
(or)
b) That you pay no annual fee but $25 for assistance, when your vehicle actually breaks down.
Circle a or b

13) Would you prefer:
a) That you pay an annual fee of $75 for highway assistance services and not pay a fee if the vehicle actually breaks down on the freeway,
(or)
b) That you pay no annual fee but $50 for assistance, when your vehicle actually breaks down.
Circle a or b

14) Would you prefer:
a) That you pay an annual fee of $100 for highway assistance services and not pay a fee if the vehicle actually breaks down on the freeway,
(or)
b) That you pay no annual fee but $150 for assistance, when your vehicle actually breaks down.
Circle a or b

15) Would you prefer:
a) That you pay an annual fee of say $25 for highway assistance services and not pay a fee when the vehicle actually breaks down on the freeway,
(or)
b) That you pay no annual fee but $100 for assistance, when your vehicle actually breaks down.
Circle a or b

16) Suppose the highway assistance service being provided now operates only on interstate highways.
Would you prefer:
a) That everyone pays an annual fee of $75 so that the highway assistance service operates on all major highways, not just interstates,
(or)
b) That everyone pays an annual fee of $50 but that the highway assistance service operates only on interstate freeways.
Circle a or b

17) Suppose the highway assistance service being provided now operates only on interstate highways.
Would you prefer:
a) That everyone pays an annual fee of $50 so that the highway assistance service operates on all major highways, not just interstates,
(or)
b) That everyone pays an annual fee of $30 but that the highway assistance service operates only on interstate freeways.
Circle a or b

18) Suppose the highway assistance service being provided now operates only during morning and evening rush hours.
Would you prefer:
a) That everyone pays an annual fee of $75 so that the highway assistance service operates at all times,
(or)
b) That everyone pays an annual fee of $50 but that the highway assistance service operates only at certain fixed times.
Circle a or b

19) Suppose the highway assistance service being provided operates only during morning and evening rush hours.
Would you prefer:
a) That everyone pays an annual fee of $50 so that the highway assistance service operates at all times,
(or)
b) That everyone pays an annual fee of $30 but that the highway assistance service operates only at certain fixed times.
Circle a or b

Please answer the following questions
1) Your age:

2) Sex: Male Female

3) Occupation (Check all which apply):
Full-time Student
Part-time Student
Working
Part-time Working

4) What is your annual income (Check all which apply)
Less than $5,000
$5,000–$10,000
$10,001–$20,000
$20,001–$30,000
$30,001–$40,000
$40,001–$50,000
$50,001–$60,000
$60,001–$70,000
$70,001–$80,000
Over $80,001

5) Do you own or lease a vehicle?
   Yes
   No

6) If you do have an automobile, what is the make, model, and year of the automobile?
   YEAR _____
   MAKE _____
   MODEL _____

7) Is the automobile in a good repair?
   Yes
   No
8) Is the recommended maintenance for the automobile being done regularly?
   Yes
   No

NOTES

[1] It is true that auto clubs offer a bundled service whereby members have a range of services from breakdown assistance to travel planning to insurance.

[2] The survey was carried out for all staff at UC-Berkeley and UC-San Diego. In order to encourage people to participate, all participants were entered into a drawing for a Personal Digital Assistant.

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