

Road User Attitudes towards Safety Initiatives in Kuwait

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Abstract: Among the factors that are far important to improve traffic safety is knowing the degree of interaction of the road users with reducing these accidents and trying to share their opinions and persuasions about such issues as breaking the law and their perception of the effectiveness of various countermeasures. A survey was carried out on a sample of road users in Kuwait from various nationalities, ages and cultures. The study aims at investigating the road user's opinion of the effectiveness of selected countermeasures in reducing the number of hazardous accidents in Kuwait. The study also investigates the potential level of support the road users would give to these measures if implemented.

Keywords: Road safety, Attitude, perception, favorability, effectiveness

I. INTRODUCTION

Effective safety remedial measures constitute a main concern for both road safety authorities and the public. Information gained from the public regarding their attitudes towards remedial measures can be an important tool for use by politicians and decision makers to decide where they consider an overall framework for effective remedial measures, as well as when and how they introduce these measures [1]. Reported that the likely response of the public will often be an important factor in assessing the road safety solutions.

Introducing efficient road safety solutions and, hence, expecting encouraging results depends on the level of support by the government and the positive interaction by the road users [2]. For instance, introducing seat-belt legislation was not received by road users with an equal degree when comparing between the different societies (i.e., countries) of the world. Different societies means different cultures and, hence, different attitudes towards any safety application. Safety culture can be assessed by observing what value and priority the society gives through its policies and action [3].

Earlier work [4] indicated that the introduction and eventual effectiveness of many road safety initiatives often depend on the level of support offered - and likely to be given-by the road using public. One of the main factors related to the attitudes of road users towards introducing new road safety initiatives and countermeasures is their perception of such solutions. The public perception is explained by their belief "of how successful or effective a countermeasure might be in terms of making roads safer for themselves and other road users [5]". Subsequently, this study was based on surveying the road users' attitudes towards specific road safety measures for Kuwait.

II. METHOD

The survey investigates what the road users in Kuwait think about potential accident-reducing solutions. The attitudes of road users in Kuwait towards specific measures were investigated through distributing a pre-designed questionnaire. The measures were selected at the discretion and using the experience of the researchers of the measures being the most adequate and acceptable to the road-using public in Kuwait. A list of these measures is given in the Appendix.

The survey questionnaire included in the Appendix was based on 'how effective any of the suggested solutions would be in reducing the number of accidents on the roads (effectiveness). Also, responders were asked to indicate the level of support that he/she offers and likely to give to each measure (favourability). A total of 26 potential countermeasures were selected which tackled different areas and issues, covering, for example, road monitoring techniques, police enforcement, driver education and training, increasing or reducing speed limits, punishment and retribution legislations, and engineering.

Perceived effectiveness of the different countermeasure was obtained using standard Likert scale technique with a five point rating scale having a verbal label as follows:

1. Increases accidents
2. Do not know
3. No effect
4. Reduces accidents little
5. Reduces accidents so much

The level of support likely to be given by the respondents was measured using a 2-point scale; either in favour (2) or not in favour (1).

III. THE SAMPLE

The questionnaire was distributed to a random sample of 748 road users covering the various areas of Kuwait (which is a small country with a population of about 3.6 millions). Table1 shows the characteristics of the sample. It can be seen that the highest group of respondents were male (65%), Kuwaiti (65.9%), 18-25 years of age (33%), residents of

Hawalli governorate (26.7%), university level (44%). Most of the respondents (53%) were owners of a private car. These percentages are expected as they match the general characteristics of the total population of Kuwait. Male drivers in Kuwait constitute about 70% of total drivers, Kuwaiti population is about 77% of total, population of age between 18 and 25 years constitute 34 % of total, about 20% of total population *reside in* Hawalli governorate and private cars are 51 % of total registered vehicles in the country These results indicate that the sample, besides being random is a representative sample.

Table 1: Sample Characteristics

Road User Category	Group (Class)	Total Respondents	Percent
Gender	Male	487	65.11
	Female	261	34.89
Age (years)	18-25	246	32.89
	26-35	212	28.34
	36-45	152	20.34
	46-55	82	10.96
	Over 55	56	7.49
Nationality	Kuwaiti	493	65.91
	Arabian	164	21.93
	Asian	50	6.68
	Western	41	5.48
Education Level	Less than high-school	27	3.61
	High-school	186	24.87
	Diploma	111	14.04
	Graduate (University)	330	44.17
	Post-graduate	94	12.57
Area (Governorate)	Capital	167	22.33
	Hawalli	201	26.87
	Farwania	153	20.45
	Mubarak Kabeer	69	9.22
	Ahmadi	105	14.04
	Jahra	53	7.09
Vehicle Type	Saloon	395	52.81
	Van	16	2.14
	Jeep	264	35.29
	Pickup	17	2.27
	Truck	22	2.94
	Bus	21	2.81
	Motorcycle	13	1.74

IV. RESULTS

Two indices were introduced to obtain the ranking scores for each of the studied countermeasures. The first is the "influence index" defined in terms of how effective the respondents thought a measure would be in reducing the number and severity of accidents. The second index is the "approval index" which is defined in terms of how much the respondents would be in favour of the measure actually being introduced.

The two averages (i.e., the Influence Index, II and Approval Index, AI) of the total responses for each measure were considered to obtain the overall average-point for that measure indicated by the letter S. The results of the data analysis for all studied measures are shown in Table 2 and depicted in Figs 1 and 2. The higher point average for a measure means more of the surveyed respondents perceive that measure likely to be effective or that they are in favour of its implementation.

Table 2 Arithmetic Means of the Perceived Effectiveness and Favourability of the Countermeasures

Countermeasure	Influence Index (II)	Approval Index (AI)
S1	3.638	1.461
S2	4.283	1.900
S3	4.417	1.928
S4	4.172	1.785
S5	4.380	1.767
S6	3.541	1.452
S7	4.202	1.704
S8	2.092	1.275
S9	4.135	1.856

S10	3.175	1.512
S11	4.191	1.809
S12	4.179	1.885
S13	3.821	1.584
S14	4.396	1.929
S15	4.398	1.886
S16	4.531	1.921
S17	4.361	1.925
S18	3.683	1.545
S19	3.983	1.714
S20	4.529	1.918
S21	4.365	1.855
S22	4.360	1.876
S23	4.469	1.861
S24	4.266	1.870
S25	4.210	1.838
S26	4.285	1.800

It can be seen that 19 out of 26 readings of the II values were above 4 meaning that the majority of the respondents believe that these measures are likely to be effective in reducing accidents.

The level of support to the measures (i.e., in favour or not) was almost similar to that for the effectiveness perception. Referring to Table 2 and Fig. 2, it can be seen that most of the point averages (i.e., AI values) are closer to the value of 2. (20 out of 26) are above 1.7 with only one measure,(increase the maximum speed limit from 120 to 140 km/h) was found close to 1 point, indicating that the measure would not be supported by the public.

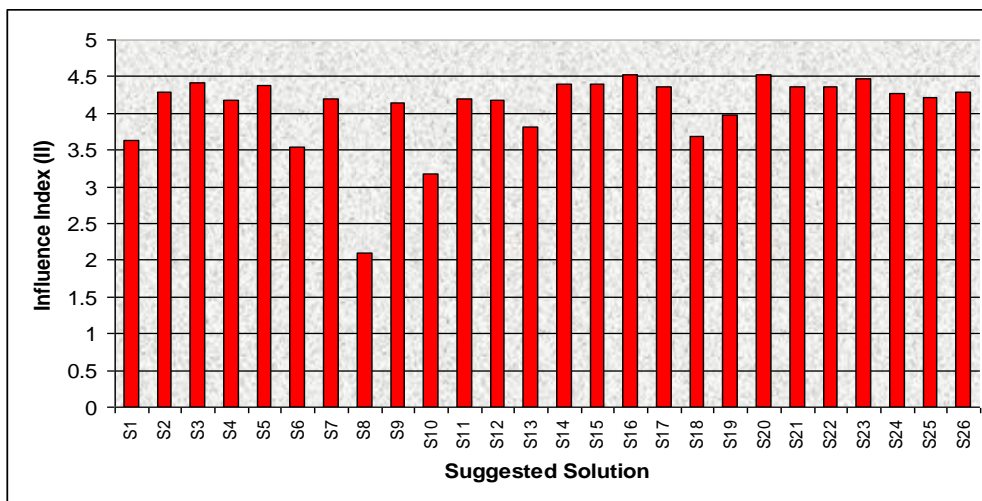


Figure 1: Influence Index Histogram

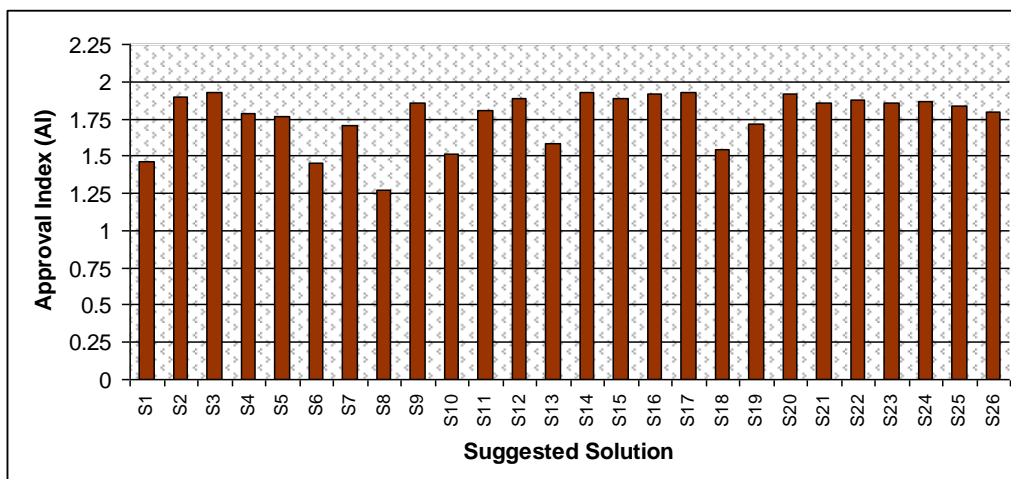


Figure 2: Approval Index Histogram

The two indices were used to obtain the ranking scores for each safety measure. As the indices represent the arithmetic mean of all the rating responses, then the higher indices are given a lower ranking indicating that the measure was perceived as being likely to result in a greater accident reduction or that its introduction would be more welcome. Table 3 shows the ranking of the studied measures in a descending order according to their effectiveness and according to their favourability. Hence, suggesting measure number S16 was seen to be the most likely to reduce accidents than the rest, and measure number S8 was the least effective.

Table 3 shows a reasonable agreement between public perception and support. If the top six measures in the table (S16, S20, S23, S3, S15 and S14) are taken into consideration, then they, with the exception of measure S23, represent the top-ranking measures for favourability as well. This parallel agreement is even more clear at the lower ranking programmes. The six least effective measures considered by the road users (S13, S18, S1, S6, S10 and S8) were also the least favoured by them, in almost similar ranking order. This agreement is illustrated in Fig.3.

Table 3: Ranking the Studied Measures According to Their Influence and Favourability Indices

Suggested Solution	Influence Index (II)	Rank II	Approval Index (AI)	Rank AI
S16	4.531	1	1.921	4
S20	4.529	2	1.918	5
S23	4.469	3	1.861	11
S3	4.417	4	1.928	2
S15	4.398	5	1.886	7
S14	4.396	6	1.929	1
S5	4.380	7	1.767	18
S21	4.365	8	1.855	13
S17	4.361	9	1.925	3
S22	4.360	10	1.876	9
S26	4.285	11	1.800	16
S2	4.283	12	1.900	6
S24	4.266	13	1.870	10
S25	4.210	14	1.838	14
S7	4.202	15	1.704	20
S11	4.191	16	1.809	15
S12	4.179	17	1.885	8
S4	4.172	18	1.785	17
S9	4.135	19	1.856	12
S19	3.983	20	1.714	19
S13	3.821	21	1.584	21
S18	3.683	22	1.545	22
S1	3.638	23	1.461	24
S6	3.541	24	1.452	25
S10	3.175	25	1.512	23
S8	2.092	26	1.275	26

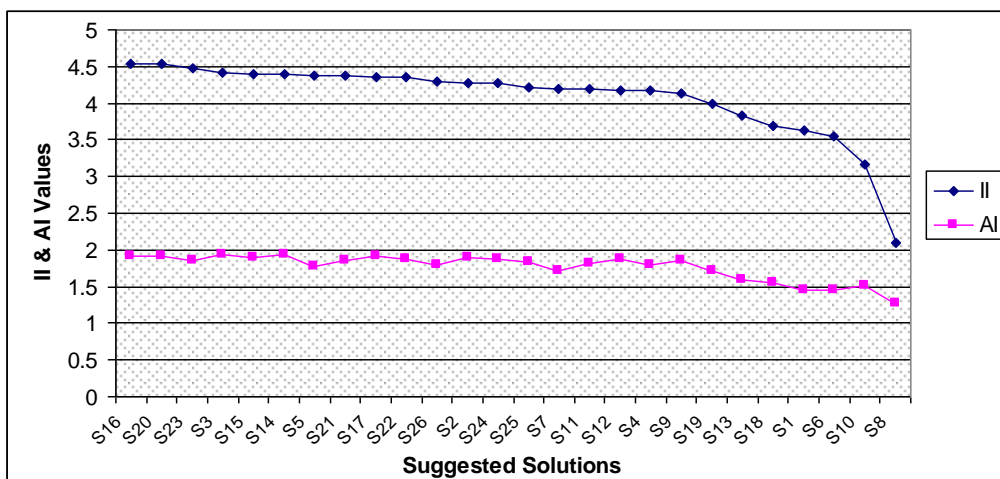


Figure 3: 2-lines Chart for the Influence and Approval Indices

Table 4 shows the top seven measures according to their favourability. It can be seen that five of those were also ranked among the top seven effective measures,

Table 4: The Top Seven Measures According to Approval Index

Suggested Solution	Influence Index (II)	Rank II	Approval Index (AI)	Rank AI
S14	4.396	6	1.929	1
S3	4.417	4	1.928	2
S17	4.361	9	1.925	3
S16	4.531	1	1.921	4
S20	4.529	2	1.918	5
S2	4.283	12	1.900	6
S15	4.398	5	1.886	7

V. DISCUSSION

The main findings of the survey can be grouped into two categories: the suggested countermeasures that received high priority in terms of effectiveness and approval by the road users; and those received the lowest interest and welcome by the road users. The top seven suggestions that produced higher index scores (II and AI) and the lowest four suggestions in terms of index scores (II and AI) are presented in Table 5.

Table 5: Highest and Lowest Measures Considering Both Indices

Suggested Solution	Measures	II-rank	AI-rank
	Highest		
Make sure that foreign chauffeurs for private homes are really eligible for driving license.	S16	1	4
Forbid truck and big-vehicle drivers from using middle lanes without necessity.	S20	2	5
Increase & improve road safety education in schools	S3	4	2
Put warning signs at usual accident sites.	S14	6	1
Improve driving test and be firm with it	S15	5	7
Increase the punishment against those who use mobile phones while driving.	S23	3	(11)
Improve traffic signs and put them in a reasonable distance before desired location	S17	(9)	3
	LOWEST		
Increase speed limit to 140km/hr instead of 120 km/hr on express-ways.	S8	26	26
Apply roundabouts more than traffic signals at intersections.	S10	25	23
Make legal age for having license 20 instead of 18.	S6	24	25
Reduce speed limit to 100km/hr on express-ways	S1	23	24

Three out of four measures that received lowest scores in Table 5 (S8, S10 and S1), whether in their effectiveness or in their approvals, are mainly linked with traffic engineering. The least of these (S8) was about increasing the speed limit, while S1 was the suggestion for reducing the speed limit. Both suggestions have been viewed by the public as irrelevant to reducing the number of accidents and were not supported. Also, switching the roundabout junctions into signal junctions did not interest the road users. S6, which suggests changing the legal age for having a driving license from 18 to 20, was not seen as a good solution and was not welcomed.

In contrast, the more welcomed solutions and thought to be effective in reducing the number of accidents were distributed between three main categories: Engineering, Education, and Legislation. More strict in licensing the Asian house drivers, prohibiting the big vehicles from using the middle lane (unless necessary), improve road safety education in schools, and Improve driving test are all related to driver behavior Issues. Whereas installing warning signs away in advance of the black-spot locations, and improving the design and the of traffic signals location, are related to traffic engineering.

The respondents' interest in educating the road users and improving their experience was obvious in the scores for suggestions S16, S3 and S15. Emphasizing upon the traffic administration in the Kuwaiti government to be much more strict in licensing the Asian house drivers exhibits the importance of education and experience. School education comes next indicating that the road users in Kuwait insist on establishing a good road-safety education in schools. S15, which calls for improving the vehicle driving test by the Kuwaiti authorities and strictly applying it also received a high score in terms of effectiveness and approval.

Legislations and punishment were also the concern of the public. Previous studies show that the drivers in Kuwait accept enforcement in terms of more strict and increase police presence on the road [6]. Suggestion coded S23 raise the issue of chastising or penalizing those who use the mobile phones while driving. This suggestion scored the 3rd highest value of

the II readings. For the approval by the respondents, it reached level 11 from 26 in the AI values. However, the AI reading for it (1.861) was very high and was towards a strong support by the public.

It should be noted that the majority of the studied measures have been welcomed by the road users and were viewed as effective which may dictate the need for an integrated programme that incorporate the most successful safety measures as perceived by the road users rather than prioritizing their implementation as separate measures.

VI. Conclusion

The study reveals that the road safety issue is of concern to road users in Kuwait and all respondents were keen to participate in finding appropriate solutions. The analysis of 748 responses regarding the road user perception towards the effectiveness and favourability of 26 carefully selected potential countermeasures produced a list of seven measures which are seen both effective and favourable. The majority of these measures are mainly linked with driver behavior issues. This may indicate that the road using public of Kuwait places the responsibility/blame on the concerned authorities.

It is recommended that a further and more comprehensive study be carried out to reach more definite conclusions regarding the identification of the most effective and favourable countermeasures which should then be implemented on a small scale to evaluate their performance before full scale application is launched.

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APPENDIX



Dear Sir/Madam

This form of survey is a tool towards understanding some of road traffic activity and safety issues in Kuwait. This should lead to improving road safety. We are hoping that you participate in finding out solutions for reducing road accidents. Would you please, kindly and sincerely, fill this form so that the results would reflect the reality. The information here will only be used for research purposes.

In the **back of this paper** is a table of suggestions for improving road safety in Kuwait. We ask you kindly to give your opinion (what you think or believe) about each suggestion. All suggestions carry one main question: Do you think that the suggestion will reduce the number of accidents? The answer will be a choice of 5. You are requested to draw a circle around one of the five choices for each suggestion. In addition, for each suggestion, we need your opinion (content): Do you support it or not? Put \checkmark under one of the 2 choices: In-favor or Not in-favor.

For example: If you think that *jail sentence for those who transgress traffic laws* will reduce the number of accidents significantly (so much) but you do not favor this suggestion of jail sentence then you should circle number 5 and put \checkmark under Not in-favor.

Look at the examples:-

Suggestion	Reduces Accidents So Much	Reduces Accidents Little	No Effect	Do not Know	Increases Accidents	In-favor	Not In-favor
1- Jail penalty for who break the traffic law	5	4	3	2	1		\checkmark
2- Unlimited Speed on highways	5	4	3	2	1		\checkmark
3- Strict penalty for taxi drivers	5	4	3	2	1	\checkmark	

Needed information about you:

Age: -----years; Gender: Male Female Profession: -----
Nationality: ----- Area of residence: -----
Education level: Below secondary Secondary Diploma
 University Higher Degree
Marital status: Married Single
Type of vehicle you use: Saloon Van Jeep Pick-up

Truck Bus Motorcycle Other: -----

Suggestion	Reduces Accidents So Much	Reduces Accidents Little	No Effect	Do not Know	Increases Accidents	In-favor	Not In-favor
1- Reduce speed limit to 100km/hr on express-ways.	5	4	3	2	1		
2- Increase pedestrian crossing facilities (pedestrian bridge, tunnel, signals).	5	4	3	2	1		
3- Increase & improve road safety education in schools.	5	4	3	2	1		
4- Increase traffic police patrol on roads.	5	4	3	2	1		
5- More seriousness in enforcing speed limit (such as hidden cameras, points against driver's license).	5	4	3	2	1		
6- Make legal age for having license 20 instead of 18.	5	4	3	2	1		
7- Increase punishments against law-breakers (increase fine, more points against driver's license, hold license for a time).	5	4	3	2	1		
8- Increase speed limit to 140km/hr instead of 120 km/hr on express-ways.	5	4	3	2	1		
9- Improve junction design (For instance, enlarge the intersection area to reduce conflict or confusion).	5	4	3	2	1		
10- Apply roundabouts more than traffic signals at intersections.	5	4	3	2	1		
11- Make it compulsory for driving learners to pass training courses before driving test.	5	4	3	2	1		
12- Increase traffic awareness programs (such as ads, flyers and, radio and TV).	5	4	3	2	1		
13- Increase road humps in residential areas.	5	4	3	2	1		
14- Put warning signs at usual accident sites.	5	4	3	2	1		
15- Improve driving test and be firm with it.	5	4	3	2	1		
16- Make sure that foreign chauffeurs for private homes are really eligible for driving license.	5	4	3	2	1		
17- Improve traffic signs and put them in a reasonable distance before desired location.	5	4	3	2	1		
18- Make traffic police-men wear civilian clothes and use ordinary cars to monitor.	5	4	3	2	1		
19- Intensify the punishment against those who drive very slow on middle lanes.	5	4	3	2	1		
20- Forbid truck and big-vehicle drivers from using middle lanes without necessity.	5	4	3	2	1		
21- Intensify the punishment against truck and goods-vehicle drivers who break the law.	5	4	3	2	1		
22- Intensify the punishment against those who use road shoulders without necessity.	5	4	3	2	1		
23- Increase the punishment against those who use mobile phones while driving.	5	4	3	2	1		
24- Be firm in approving the vehicle safety and eligibility before renewing the registration	5	4	3	2	1		
25- Making a traffic violation campaign against faulty vehicles (such as broken lights or bad tires).	5	4	3	2	1		
26- Increase monitoring-cameras on main roads and at traffic-signal intersections.	5	4	3	2	1		

Suggestions and Comments: