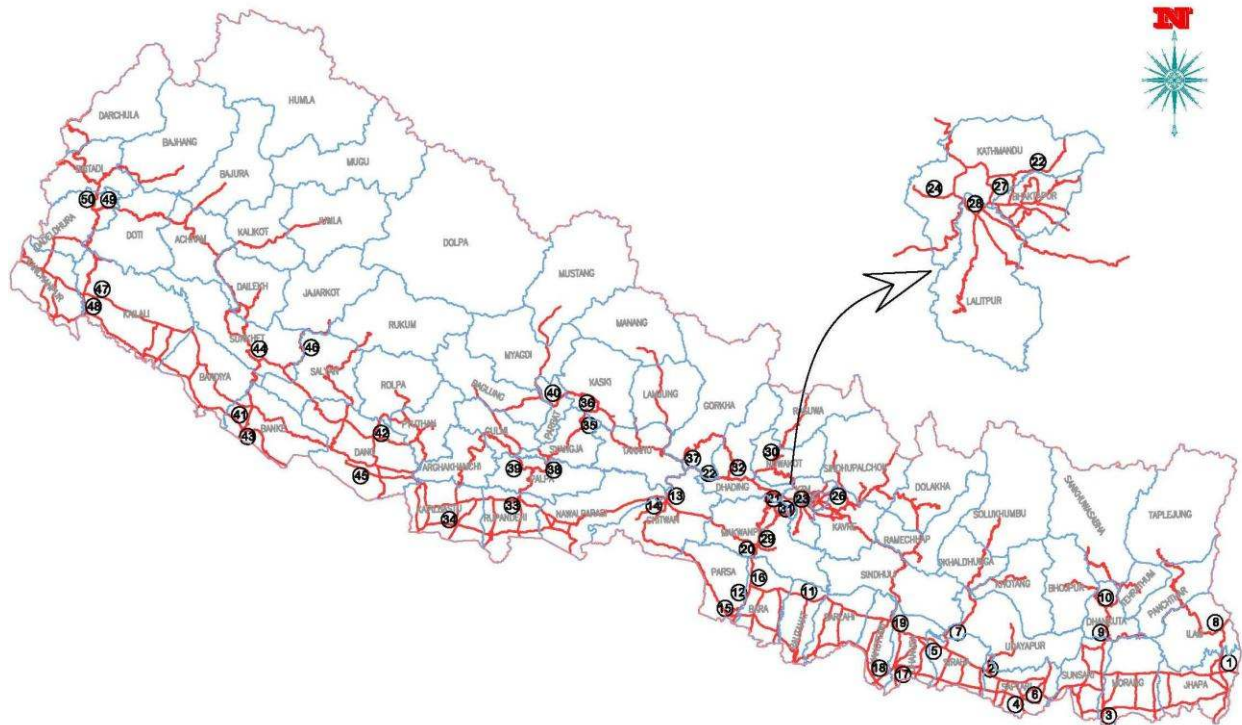




Roads Board Nepal

Min Bhawan, Kathmandu

FINAL REPORT



ROAD USERS' SATISFACTION SURVEY- II

Contract No. -RBN-2068/69/RUSS-II

June 2013

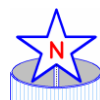
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We would like to express our sincere appreciation to Roads Board Nepal, for entrusting us the responsibility to carry out the task of “Road Users’ Satisfaction Survey-II”. As per the responsibility assigned to us, we have completed the task in a Draft form as per the best of our knowledge and belief.

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We wish that the outcome of Road Users’ Satisfaction Survey-II as presented in this report will be highly beneficial for Roads Board Nepal for further improvement and enhancement of road service delivery to the users.

Dhruba Raj Tripathi

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List of Acronyms

AADT	Average Annual Daily Traffic
DDC	District Development Committee
DoLIDAR	Department of Local Infrastructure Development and Agriculture Roads
DOR	Department of Roads
DOTM	Department of Transport Management
DR	District Roads
FGD	Focused Group Discussion
GON	Government of Nepal
IDI	In-Depth Interview
LRA	Local Road Agency
LRN	Local Road Network
MoLD	Ministry of Local Development
MoPPW	Ministry of Physical Planning and Works
MU	Municipalities
NGO	Non-Government Organization
NMV	Non-Motorized Vehicles
PSP	Private Sector Participation
RA	Road Agency
RBN	Roads Board Nepal
RoW	Right-of-Way
RUSI	Road Users' Satisfaction Index
RUSS-I	Road Users' Satisfaction-I
RUSS-II	Road Users' Satisfaction-II
SI	Structured Interview
SR	Strategic Roads
SRN	Strategic Road Network
SSRN	Statistics of Strategic Road Network
TOR	Terms of Reference
UR	Urban Roads
VPD	Vehicle per Day

EXECUTIVE SUMMARY

In order to improve performance on public service delivery, the Government of Nepal is undertaking comprehensive set of actions under economic restructuring programs such as users' surveys or consultations to identify problems and bench mark progress. RBN provides maintenance fund to DoR for SRN; likewise District Development Committees (DDCs) and Municipalities (MUs) for LRN. The main task is to measure road customer's satisfaction through RUSS-II. In this regard, RBN has conducted RUSS-I in the year 2006 with the objectives of bringing out view on public perceptions of current road sector outcomes; GON/road line agencies performance and government policies, documentation of views in comprehensive format suitable for comparison overtime. In similar manner, Road User's Satisfaction Survey-II has been undertaken in 2012.

The survey goal is to help for improving road transport outcomes in the country by providing the insight of the issues and concerns raised by road users of the network to the senior management in the GoN and Road Sector line agencies and thereby influencing future strategy and operational decision.

RUSS-II has been undertaken on 1250 Km selected sample lengths of SRN, DR and UR selecting 50 service centers nationwide for the interaction with the users groups and other stakeholders. The sections of roads were selected representatively in Hill and Terai; and five development regions.

For the purpose of RUSS-II, total sample size of 2853 representing all types of road users covering various roads in different terrain and five development regions nationwide has been selected on the basis of available traffic data.

The methodology adopted for different types of road users was structured interviews (SI), in-depth-interviews (IDI) and focused group discussion (FGD) through pre-prepared questionnaires, checklists, face to face interaction and group discussion etc. Sample road length for survey was randomly selected in proportion to the total road length covered by each category of roads based upon the prevailing traffic density.

Out of 50 service centers, 25 centers were selected in road sections having Average Annual Daily Traffic of High Volume (AADT more than 1500 vehicles per day), 15 service centers having AADT of moderate traffic (AADT between 250-1500 VPD) and the remaining 10 service centers for road sections having low (less than 250 VPD) traffic volume.

For RUSS-II, 1497 main road users, 1106 vulnerable road users and 250 other road related institutions/ associations were interviewed on 50 different service centers covering 558 km of strategic roads, 530 km district roads and 162 km urban roads throughout the kingdom of Nepal.

During the survey, the consultant were seek to elicit the respondents' perception on road network outcome/attributes and road agencies performance on five major indicators, namely road conditions & perceived Impact, comfort & convenience, safety aspects, travel amenities and perception about road agencies with respective sub-indicators

The survey findings are elaborately explained and presented in various sections supplemented with Tables and Figures in the respective chapters. Based on the findings and analysis, several conclusions have been drawn as follows:

- ✚ Profile pattern of the respondents showed that the most of road users were found literate (91%) with education level up to graduate and above while only 9% found illiterate. Respondents earning in the range of NRs 5,000 to NRs 20,000 per month; and above are each 44 % and the remaining 12 % earn less than NRs. 5,000. Respondents up to 64 % were found to be daily road users who used to travel for business/job/agricultural purposes. Similarly 68% of road users were aware of traffic rules and regulations which they followed while traveling/driving on roads. Mostly the rickshaw pullers and tempo drivers were found traffic rules violators.
- ✚ Majority of respondents (46%) were satisfied with the road quality, smoothness and appearance of road surface. Comparatively road quality of SR was better than other

roads. Poor road condition, narrow road width, aggressive overtaking, reckless road crossing by pedestrian/cattle, wrong/illegal road parking and improper/insufficient road signs etc. were the main irritating factors for road users.

Overall Satisfaction

Overall satisfaction level of road users on major indicators is shown in the following Table:

Overall Satisfaction Level

Indicators	Satisfaction Level (%)
Road Condition and its perceived impact	54
Comfort and Convenience	53
Safety	51
Travel Amenities	40
Perception about Road Agencies	50

These figures show that travel amenity aspect is least cared by the concerned authorities. Present research on RUSS-II shows that overall road condition and its perceived impact, comfort and convenience, safety aspects and perception about road agencies are relatively satisfactory.

Region wise satisfaction

Following table shows the overall satisfaction level of road users is region-wise:

Satisfaction level region wise

(All figures are in percentage)

Region	Road Condition	Comfort and convenience	Safety	Travel Amenity	Perception about Road Agencies
Central	55	53	53	40	50
Eastern	49	57	54	37	50
Western	58	52	46	44	49
Mid-Western	55	51	42	29	45
Far-Western	58	52	44	56	58

Road type wise satisfaction

Road type wise distribution of overall satisfaction level of road users is given in the following table. Outcome of the survey result shows that the satisfaction level of road condition and its perceived impact, and travel amenities in strategic roads are better than district and urban roads, whereas the satisfaction levels of comfort and convenience, safety and perception about road agencies are relatively higher in district roads.

Road Type Wise Satisfaction Level

(All figures are in percentage)

Road Type	Road Condition	Comfort and convenience	Safety	Travel Amenity	Perception about Road Agencies
SR	53.7	48.4	47.4	39.1	44.9
DR	49.7	52.1	50.8	38.5	47.0
UR	50.2	46.2	49.6	36.7	43.1

Terrain type wise satisfaction

Overall satisfaction level of road users in terms of terrain type is as follows:

Terrain Type Wise Satisfaction Level (Hill & Terai) (All figures are in percentage)

Region	Road Condition	Comfort and convenience	Safety	Travel Amenity	Perception about Road Agencies
Hill	56	54	50	40	50
Terai	53	52	52	41	49

- The outcome of overall survey shows that the satisfaction level of each aspect of roads is found more or less the same in the range of 40 to 55 percent.
- Respondents pointed out to adopt e-bidding process in the procurement of works in transparent manner and further stressed on quality of works to be supervised by site engineer regularly and monitoring and evaluation by higher authority.
- Most of respondents suggested that the illegal encroachment of right-of-way can be significantly reduced with the help of NGO/local political leaders/local administration and police.

Multiple Linear Regression Analysis

In order to determine the Road Users' Satisfaction Index (RUSI), multiple linear regression analysis with 'Overall satisfaction' as dependent variable and five major indicators discussed above as independent variables has been carried out. The regression model as determined from the analysis is given as:

$$\text{Overall Satisfaction} = 0.21 \times \text{Road Condition \& Perceived Impact} + 0.26 \times \text{Comfort \& Convenience} + 0.11 \times \text{Safety} + 0.28 \times \text{Travel Amenities} + 0.13 \times \text{Perception about Road Agency} + 0.20 (\pm 0.25)$$

Sample size: 2603

The figure multiplied to each indicator represents the coefficient of each variable of the linear regression equation and the error factor at 95 % confidence level is ± 0.25 .

The coefficient to each independent variable of the linear equation signifies the degree of its contribution towards the change in overall satisfaction. That means the contribution of independent variable on Overall Satisfaction will be 21% of the perception in road condition & perceived impact, 27% of the perception in comfort & convenience, 11% of the perception in safety aspects, 28% of the perception in travel amenities and 13% of the perception about road agency. The significance of the intercept (+.20 in the present analysis) is that even if the values for all the independent variables tend to zero, there is still some satisfaction amongst the road users due to only the presence of road. Present analysis shows in the attributes of road users that travel amenities and comfort and convenience have the highest, and the safety aspect the least contribution towards overall satisfaction

Road Users' Satisfaction Index (RUSI)

Road users' satisfaction indices have been prepared on the basis of '1' to '5' points rating scale, significant rating of each point being as given in the following table:

Point	Satisfaction Rating
5	Highly satisfactory
4	Satisfactory
3	Somewhat satisfactory
2	Dissatisfactory
1	Highly dissatisfactory

The results are separately presented for different types of roads, hilly/rolling and terai terrain, five development regions and 50 service centers in the following sub-sections:

RUSI – Road Category Wise

The RUS Index score for different categories of roads, as presented in Table 10.6 shows that the overall rating for strategic roads (RUSI: 2.49) is slightly towards dissatisfaction. Individual satisfaction for each major indicator (Table 10.4) shows the most lacking aspect is the perception about travel amenities especially parking facilities, public toilets, public water taps, rain shelter/bus stops workshop/mechanics etc. Responsible road agency for SR, mainly the DOR, is therefore required to give more attention on these aspects so as to increase the level of satisfaction. RUS Index for district roads is towards satisfaction, whereas in urban roads, it is dissatisfactory. Responsible agency, mainly the municipalities have to pay more attention for improvement of urban roads.

The index score separately presented for motorized and non-motorized users (Table 10.6) shows the satisfaction level of motorized users is highest in strategic roads, second highest in urban roads and least in district roads whereas in non-motorized users' rating, it is found highest in DR, second highest in UR and the least in SR. The high rating by non-motorized users in DR is primarily due to the availability of easy access to rural areas where they can easily commute to and from their homes, transport goods, and have access to market places. It may also be due to very little concerns for local users regarding the operation and maintenance cost, whereas for motorized users it is of major concern. However, the analysis shows that the difference in index scores is not as high as one could have expected. The gap between road users' expectations and their experience plays a major role in determining satisfaction index scores. That is why DR and UR have shown better in terms of index scores than SR whose conditions are otherwise better.

Table 10.6 RUS Index for different Categories of Roads (Figures are in Index score)

S. No.	Road type	RUS Index (Motorized users)	RUS Index (Non-motorized users)	Overall RUS Index
1	SR	2.86	2.23	2.49
2	DR	2.30	2.70	2.52
3	UR	2.60	2.25	2.39

Motorized users sample size: 1497; Non-motorized users sample size: 1106

RUSI – Region Wise

From the result of users' satisfaction analysis, maximum overall index score has been achieved for far-western region and the least one for mid-western region. The overall indices for other three regions were found to slightly differing. The reason is probably the relatively recent development of newly constructed road network in far-western region where the road conditions are relatively better and the users availed unexpectedly a new road service delivery. However the in depth analysis shows a better perception on travel amenities and perception about road agencies in far-western region, comfort and convenience; and safety aspects in eastern region and improved road condition in western region.

Table 10.7 RUS Index for five Development Regions (Figures are in Index score)

S. No.	Region	RUS Index
1	Far-Western	2.88
2	Western	2.67
3	Central	2.64
4	Eastern	2.60
5	Mid-Western	2.37



 RUS-Index in decreasing order

RUSI – Terrain Type Wise

The RUS index in hill/rolling terrain is slightly higher than that in Terai. However the in depth analysis shows the safety and travel amenities aspects in Terai region were found higher rating by the road users.

Table 10.8 RUS Index for Hill/Rolling and Terai (Figures are in Index score)

S. No.	Terrain Type	RUS Index
1	Hill/Rolling terrain	2.65
2	Terai	2.60

RUSI – Service Centre Wise

Road users' satisfaction indices at different service centers studied are presented separately in table 10.10. As one would expect the overall satisfaction level at Manohara Bridge service center in Bhaktapur (Koteshwor – Suryabinayak road) is found to be the highest whereas it is lowest at Janakpur. Unlike in region-wise, road type and terrain type wise RUS Index, there is comparatively bigger gap between the highest and lowest level of users' satisfaction which indicates road specific attributes of the road users. Better roads have certainly the better perceptions to users. Service centers near well maintained roads have better rating towards users' perception.

However the in depth analysis shows the users' attributes on different outcome count differently at various service centers. Users' satisfaction level on road condition and its perceived impact is highest at Kakarbhitta and lowest at Dandeldhura service center. Users' satisfaction level on comfort and convenience is again highest at Kakarbhitta and lowest at Taudaha service center. Safety aspect is found best at Simara and worst in Harisiddhi, Similarly the satisfaction level on travel amenities is found highest at Harisiddhi and lowest in Nepalgunj whereas the users at Lahan have better perception about road agencies and lowest at Baghauda service center.

Service center wise RUS indices at different types of roads surveyed shows that 23% of strategic roads (7 out of 31 roads), 83% of district roads (10 out of 12 roads) and 86% of urban roads (6 out of 7 roads) surveyed have the RUS indices below average i.e. towards dissatisfactory ratings. These figures on road users' perception indicate that the responsible road agencies have to give more attention especially district roads mostly by District Development Committee's and urban roads mostly by Municipalities.

RUS Index for Different Service Centers

(Figures are in Index score)

S.No.	Service Center	Road Link	RUS Index
1	Manohara Bridge	ARM (Manohara Bridge-Gatthaghar), SR	3.56
2	Lahan (West)	MRM (Lahan-Mirchaiya), SR	3.28
3	Kakarbhitta (West)	MRM (Kakarbhitta-Birtamode), SR	3.19
4	Pokhara (North)	Pokhara – Baglung at Yamdi Bridge, SR	3.08
5	Dungrai (Dadeldhura)	Dadheldhura-Bagakot, DR	3.00
6	Syaule (South)	Attariya – Syaule, SR	2.98
7	Attariya (East)	MRM (Attariya-Junga), SR	2.95
8	Mugling (east)	PRM (Mugling-Malekhu), SR	2.93
9	Dhankutta (south)	KRM (Dhankuta Bhedetar), SR	2.91
10	Chandranigapur	MRM (Pathalaiya-Chandranigahapur), SR	2.89
11	Bharatpur	Bharatpur City Roads, UR	2.85
12	Fikkal (east)	Fikkal – Pahupati Nagar, SR	2.85
13	Abukhaireni (North)	Abukhaireni-Gorkha, SR	2.84
14	Hetauda (West)	MRM (Hetauda-Narayanghat), SR	2.81
15	Hetauda (North)	Samari Bridge (Hetauda-Bhainse), SR	2.79
16	Galchhi (North)	Galchhi - Trishuli Road, SR	2.78
17	Simara	TRP (Pathaliya-Birgunj), SR	2.78
18	Butwal (South)	SRM (Butwal-Bhairahawa), SR	2.76
19	Dhalkebar (west)	Ratubridge Dhalkebar – Nawalpur, SR	2.72
20	Thankot	TRP (Naubise-Kalimati), SR	2.70
21	Ghorahi (West)	Ghorahi- Tulsipur, SR	2.66
22	Taulihawa	MRM Highway-Taulihawa, DR	2.63
23	Harisiddhi	Satdabato-Harisiddhi, SR	2.63
24	Ramnagar	MRM (Narayanghat North), SR	2.61
25	Tansen (West)	Tansen-Ridhi-Tamghas, SR	2.55
26	Chhinchu (East)	Chhinchu – Jajarkot, SR	2.53
27	Lekhnath	PRM (Pokhara-Kotre), SR	2.50
28	Pokhara	Pokhara City Road, UR	2.48
29	Mangal Bazar	Lalitpur: Pulchowk-Mangal Bazar, UR	2.41
30	Lamidanda	Pachkhal–Melamchi Road, SR	2.40
31	Dadeldhura (North)	MKRM (Dadeldhura – Khodpe), SR	2.39
32	Deurali (Trishuli)	Trishuli-Deurali, DR	2.38
33	Battisputali	Kathmandu City Road, UR	2.38
34	Surkhet (South)	RRM (Surkhet-Chhinchu), SR	2.33
35	Nepalgunj	Nepalgunj City Road, UR	2.28
36	Lamahi (South)	Lamahi – koilabas, DR	2.25
37	Jorpati (North)	Jorpati-Sundarijal, SR	2.21
38	Aryabhanjyang (East)	Aryabhanjyang –Rampur, DR	2.17
39	Birgunj	Birgunj City Roads, UR	2.16
40	Biratnagar	Biratnagar Municipal Roads, UR	2.10
41	Taudaha	Chobhar-Dakshinkali Road, SR	2.06
42	Dry Port, Sirsiya	Birgunj Thori, DR	2.02
43	Bhardaha (south)	MRM Bhardaha Rotary Towards Hanumannagar-Rajbiraj Road, SR	1.98
44	Hile (West)	Hile – Bhojpur, DR	1.94
45	Baghaudha	Nepalgunj – Baghaudha, DR	1.93
46	Mirchaiya	Lahan – Bhagwanpur, DR	1.91
47	Jaleshwore	Jaleshwore – Matihani, DR	1.84
48	Rajbiraj (Jamuni)	Rajbiraj – Balan, DR	1.79
49	Mirchaiaya (north)	Mirchaiya – Katari Road, SR	1.77
50	Janakpur	Janakpur – Manaharpur, DR	1.65

RUS-Index in decreasing order

Female Road Users' Satisfaction

In the present research study, there were 316 females (+12%) out of 2603 total sample size. Out of 316 respondents 27 were the motorized users including drivers, whereas the rest 289 were the non-motorized users. Satisfaction level of female road users has been assessed on the basis of responses from female road users only. In assessing the satisfaction of female users, responses on few indicators which are most relevant to females only are used and satisfaction level on each indicator is shown in the following table:

Table 10.10 Satisfaction Level of Female Road Users (All figures are in percentage)

Indicator	Sub-Indicator	Perceived Satisfaction Level
Road Condition and its perceived impact	Road condition	59
	Travel time	58
Comfort and Convenience	Accessibility to settlements	72
	Irritating factors	72*
	Comfortability	64
Safety	Feeling safe	13
	Availability of police post	99
Travel Amenities	Public toilet	11
	Restaurants	89
	Public taps	10
	Medical facilities	70
	Rain shelter/ Bus stop	1
	Parking facilities	5
Perception about Road Agencies	Complaint redress	75

From the study of the above table, it is clear that the female attribute on road condition and its perceived impact including its sub-indicators is above average i.e. somewhat satisfactory. In comfort and convenience aspects, accessibility to settlements due to the presence of roads is quite satisfactory. Similarly the comfortability as a whole is also towards satisfactory level.

Irritating factor is negative driver. Percentage response to this indicator is also quite high which indicates a lot of irritation due to various factors mainly the road side parking, narrow road, over speed, reckless overtaking, aggressive driving etc. In safety aspects, overall safety feeling is almost highly dissatisfactory. On the other hand, availability of police post is highly satisfactory. Therefore, it is urgently required to address the issues for increasing safety feeling of female road users.

In travel amenity aspects, availability of restaurants i.e. food/drinks etc. is highly satisfactory and similarly a slightly lesser attribute on availability of medical facilities. But the perception on other indicators namely public toilets and drinking water taps, rain shelter/bus stop and parking facilities etc. are highly dissatisfactory to female road users. Responsible road agency is therefore, required to properly address such issues during the construction of road itself and/or during upgrading/ rehabilitation stage. In female respondents' perception, the complaint redressal practices of various road agencies have been found satisfactory.

Major Findings

- Priority ranking for improvements of better road services (comfort and convenience, safety, value for time, value for money, travel amenities and visual appeal) to be delivered by road agencies reveal that the majority of respondents (60%) ranked the comfort and convenience as '1', safety as '2', Value for time as '3', Travel amenities as '4', Value for money '5' and Visual appeal as '6' where 1' being the most important, then '2' and so on.

- Priority ranking for improvements of better road structures (widening existing roads, informatory/ warning signs, make significant road width, more road side facilities, tougher road traffic rules enforcement and widening/improvement of curves) to be delivered by road agencies show that the majority of respondents (60%) ranked widening the existing roads as '1', informatory/warning signs as '2', Make significant road width as '3', More road side facilities as '4', Tougher road traffic rules enforcement as '5', and Widening/ improvement of curves as '6', where '1' being the most important, then '2' and so on.
- In region wise distribution of satisfaction level, the road users' perception on 'road condition' is relatively higher in western region, whereas both 'comfort and convenience' and 'safety aspect' are higher in eastern region. Similarly the travel amenities and perception about road agencies are higher in far-western region.
- Road category wise distribution of satisfaction level shows that 'road condition and its perceived impact', 'travel amenities' in strategic roads are better than district and urban roads, whereas the satisfaction level of 'comfort and convenience', 'safety' and 'perception about road agencies' are relatively higher in district roads.
- A comparison between selected key variables which were common in both RUSS-I and RUSS-II shows substantial improvement on satisfaction level in most of the key indicators.

Future Policy and Operational Priorities:

- Road users pointed out to adopt the procurement of works timely in a transparent manner through e-bidding process and further stressed on the quality of works.
- Most of respondents suggested that the illegal roadside parking, excessive axle loading; encroachment of right-of-way, violation of traffic rules and regulations can be significantly reduced with the help of NGO/local political leaders/local administration and police.
- Majority of road users were in view of speed limits at key locations like schools, hospital, market places and black spot areas etc.; reform prevailing policy to ban old and polluting vehicles from urban areas; involvement of private-sector participation for road maintenance works.

Comparison between RUSS-I and RUSS-II

Comparison of satisfaction level of selected key variables which are common in both RUSS-I and RUSS-II is as follows:

- Road users are found to be more aware of traffic rules and regulation in RUSS-II.
- Outcome of RUSS-II shows that the hospitals (mainly clinic) have increased along all road sections, whereas the government hospitals remained the same or seem even decreasing in RUSS-II which is mainly due to the increase in survey length and number of service centers as compared to RUSS – I and the government hospitals remaining the same numbers.
- Satisfaction level on availability of petrol pumps in RUSS-II has increased considerably.
- Satisfaction level of road users on safety aspect has increased in RUSS-II, but at the same, a significant numbers of road users regard it as decreasing too, which may be mainly due to the rapid expansion of unpaved seasonal local roads network.
- Satisfaction level on adequacy of road width has increased in RUSS-II. Comparatively district and urban roads width is somewhat inadequate than strategic roads.
- Satisfaction level on the issue of road congestion in RUSS-II has slightly improved since RUSS-I, but at the same time it has also declined mainly because of urban traffic expansion. However the road reliability has significantly increased in RUSS-II.
- The outcome of RUSS-II shows a significant improvement in quality of road maintenance.

Recommendation and Suggestions

The users' perception and consultant's recommendation with suggestions are as follows:

S. No	Agency	Users' Perceptions	Consultant's Recommendation and Suggestions
1	Roads Board Nepal (RBN)	<ol style="list-style-type: none"> 1. RBN should allocate the budget for maintenance to different road agencies on the need basis and its performance. 2. RBN should monitor and evaluate the performance of road maintenance. 3. RBN should ensure that toll-charges are utilized in road maintenance works only. Some of road users said toll-charge is low and many are unaware of it. 	<ol style="list-style-type: none"> 1. The Board should consider the work performance of concerned agencies like DOR divisions, DDC and Municipalities for the release of further budget on their work performance 2. Maintenance and repair of all types of roads are carried out by different road agencies and the Roads Board should monitor and evaluate the performance all works regularly. 3. RBN needs to inform the general public through media and television about the toll-charge so that they are convinced that their charged-money is properly utilized in road maintenance. The Board should be in a position to fix the toll-charge reasonably with regards to current inflation rate.
2	Department of Roads (DOR)	<ol style="list-style-type: none"> 1. DOR should continue the process of e-bidding for the procurement of maintenance works. 2. DOR should identify the illegal encroachment of right-of-way. 3. DOR should improve the road condition, road geometry, quality of road maintenance and implement the installation of sufficient road signs and road marking. 4. DOR should be alert for road accident management, and resolve other road related problems quickly. 5. DOR should construct places for parking facilities, public toilets, taps, 	<ol style="list-style-type: none"> 1. DoR has been continuing e-bidding process for a quite long time; it should be encouraged to continue for the elimination of all bidding hassles like cartelling to suppress competition, physical threat to bidders, tampering of tender files etc. 2. DOR should check the illegal encroachment of right-of-way well in time with the help of NGO/local political/local administration and police force. 3. DOR should take up the study for the improvement of road condition and road geometry like sharp bends, improper curves and hair pin bends, narrow width to be widened, installation of sufficient road signs and road marking for reliable, safe and comfortable traveling on roads so that road accidents can be minimized in both hilly and Terai roads. 4. DOR has been initiating with its heavy equipment to clear the debris resulted from natural calamities and road accidents and should be alert as usual particularly during rainy season. DOR should improve the satisfaction level of road users by resolving the maintenance, quality and repair of road related problems in time. 5. In response to respondents' satisfaction level with the parking facilities, DOR should initiate for the construction of

S. No	Agency	Users' Perceptions	Consultant's Recommendation and Suggestions
		rain shelter and places for bus stop required along the strategic roads.	parking places, public toilets, taps, rain shelter and places for bus stop along SR and city areas to avoid accidents and congestion.
3	District Development Committee (DDC)/ Municipality	<ol style="list-style-type: none"> 1. Improvement of the road features / structures and installation of sufficient road signs and road marking in both hilly and Terai roads. 2. Installation of required number of streetlights and construction of the parking facilities, public toilets, taps, rain shelter and places for bus stop along the roadsides. 3. DDC and Municipality should provide information on road works on progress. 4. DDC and Municipality should be ready for road accident management and clear it quickly. 5. Plantation of trees along the roadsides. 	<ol style="list-style-type: none"> 1. As per the findings of road users' perceptions, DDC/Municipality should carry out detailed study for the improvement of all road geometry like sharp bends, improper curves and turns, narrow road, installation of sufficient road signs and road marking for reliable, safe and comfortable traveling on roads. Routine, recurrent and periodic maintenance and improvement works should also be taken up timely to keep the road free from potholes and cracks. 2. From the perspective of 'Safety', and 'Comfort and Convenience', DDC and Municipality should take up the detail study for the installation of streetlights and construction of parking facility, public toilets, taps, rain shelter and places for bus stop along the roads and within city areas. 3. As road users have little information on road works, DDC and Municipality should provide detail information about the existing condition of roads and works on progress 4. DDC and Municipality should have trained technical man-power and sufficient equipment to deal with accident management and clear it as quickly as possible without interrupting the traffic. 5. Majority of road users feel that plantation of trees along the roadsides is not adequate. So, the LRA especially the Municipality should take initiatives for this work with the cooperation of NGOs and Department of forest.
4	Department of Transport Management (DOTM)	<ol style="list-style-type: none"> 1. Raising awareness of road safety among road users. 2. Strict check on polluting vehicles and 	<ol style="list-style-type: none"> 1. DOTM should launch rigorous campaign for raising awareness of road safety aspects among road users with the co-ordination of Road agencies (RBN/DOR/DDC/ Municipality). Utilization of helping hands of various media, television, NGOs, community-based organization, school, chambers of commerce, traffic police can be effective. 2. DOTM should check strictly on polluting vehicles in the city with cooperation from

S. No	Agency	Users' Perceptions	Consultant's Recommendation and Suggestions
		<p>ban old vehicles in city areas and establish network linkage with police.</p> <p>3. DOTM should arrange on the job training to non-motorized vehicle drivers and road users, and reform the policy of license.</p> <p>4. Prohibition of heavy vehicles in the city.</p>	<p>police and should reform the prevailing policy to ban old vehicles from urban areas. Also, DOTM should co-ordinate with traffic police to establish network linkage with them to establish network linkage between them for the management of accidents.</p> <p>3. DOTM should arrange on-the-job training to drivers including non-motorized vehicle drivers and road users and should reform prevailing licensing-system so that only competent applicants get their driving licenses.</p> <p>4. DOTM should take initiative with regards to prohibition of heavy vehicles in the city. For this purpose institutional strengthening of DOTM is needed to install and manage effective axle-load mechanism.</p>
5.	Traffic Police.	<p>1. Enforcement of traffic rules and regulations.</p> <p>2. Penalizing the violators of traffic rules and regulations.</p>	<p>1. Traffic rules and regulations can be enforced effectively by the traffic police who need to mainly concentrate in controlling unsafe driving habits such as drunk-driving and over speeding.</p> <p>2. Violations of traffic rules and regulations should be strictly penalized and driving license should be confiscated on the event of violating traffic rules several times.</p>

1. INTRODUCTION AND PROJECT BACKGROUND

1.1 Project Background

Road infrastructure is considered to be the backbone for overall socio-economic development of the nation. Almost 90% populations in Nepal depend on road transport for the movement of goods and services and has been the cheapest mode of transportation so far. Effective, efficient, safe and reliable transport is the need of people. At present Strategic Road Network (SRN) comprises of 11,635 Km of road length. Population influenced per Km road in numbers is 2288 and road density 7.91 Km/100 km² (Statistics of Strategic Road Network, SSRN 20011/2012, DoR). Similarly, total road length of Local Road Network (LRN) comprising district, village and local roads is 42687.88 Km (Nepal Rural Road Records, 2067/68 B.S.), out of which around 11,000 Km. is considered as district roads in serviceable condition.

Even though there seems to be a gradual improvement in the services provided by the road sector, nevertheless, it has been facing some problems, such as;

- i) inadequate resource allocation for road maintenance;
- ii) less priority given for road maintenance by the stakeholders
- iii) less attention in road safety;
- iv) least enthusiasm of Private Sector Participation (PSP) in road maintenance works;
- v) Institutional constraints of key Road Agencies

The road network is one of the most valuable assets in the country, facilitating the movement of people and goods every day. The network in one hand has some significant positive impact on society through stimulating growth, generating employment and helping to integrate the country, and on the other hand it also has some negative impact like increase in accidental death and injury, environmental damage and social costs in terms of community severance or destruction of cultural property. Moreover, with the large amount of public fund invested in road sector and the significant amount of road related tax and charges collected, all the stakeholders should be keen on the performance of road network. Yet despite these significant direct impacts on public, the level of effective dialogue between governmental departments responsible for roads and the road users has traditionally been very limited and informal.

The road line agencies are responsible for planning, designing and construction of roads and bridges, and maintain them as well on behalf of the Government of Nepal through its available human resources. To manage and maintain the road network effectively and to meet the transport demands as of a modern economy, the road agencies need to improve their efficiency. Up to date, the performance of road agencies has been measured largely in terms of expenditure progress instead of benefit to road users. Road planning needs updating and in particular requires the systematic collection and analysis of data from the field.

The Government of Nepal has articulated its strategy for enhancing road sector performance through publication by local government act with their right and responsibility for local road network development through DOLIDAR, along with the activities of DOR for strategic road network. The National Transport policy (2058) states its objectives as to provide economic, safe, comfort, reliable and sustainable transport system in the Country to develop the social, economical, cultural and tourism sector.

In order to improve performance on public service delivery, the Government of Nepal is undertaking comprehensive set of actions under economic restructuring programs such as user's surveys or consultations to identify problems and bench mark progress. RBN provides maintenance fund to DoR for SRN; likewise District Development Committees (DDCs) and Municipalities (MUs) for LRN. Since RBN is advocating for levying service delivery charge, its main task is to measure customer's satisfaction i.e. through road user's satisfaction survey. In this

regard, RBN has conducted Road User's Satisfaction Survey in the year 2006 with the objectives of bringing out view on public perceptions of current road sector outcomes; GON/road line agencies performance and government policies, documentation of views in comprehensive format suitable for comparison overtime and presenting the findings to senior decision-makers in GON/related agencies and general public. The RUSS-I has identified issues and concerns raised by road users related to road conditions and road management by the line agencies. The user's perceptions and recommendation to different road agencies were collected and used for improvement such as allocating maintenance budget on the basis of performance of RAs, raising awareness level by using Audio/video system, such as Radio FM, TV etc. initiation for funding to regulating axle-load, different awareness campaigns for road safety has also been made.

Since the amount of investment for the maintenance of roads has been increasing, the accountability towards the proper utilization of the fund and its impact to the road users need to be assessed. Hence Road User's Satisfaction Survey-II has been undertaken. The survey aimed to capture the experiences and perceptions of stakeholders. It is believed that the outcome of the survey will help to improve road transport services by providing insight in to the issues and concerns raised by road users, thereby helping to influence future strategic and operational decisions. RUSS-II will also help to design and develop Road User's Satisfaction Level comprising of different variables.

1.2 Project Objectives

The survey goal is to help for improving road transport outcomes in the country by providing the insight of the issues and concerns raised by road users of the network to the senior management in the GoN and Road Sector line agencies and thereby influencing future strategy and operational decision.

The specific objectives of the Road User Satisfaction Survey (RUSS) are as follows:

- Elicit views on public perceptions of current sector outcomes, GoN / road line agencies performance and government policies.
- Develop a composite road user satisfaction index (RUSI) which could be mainstreamed in the RBN context. The idea is to take the user survey / feedback exercise beyond the project and mainstream within RBN operations so that the policy making / program formulation in the road sector could benefit from such structured method of feedback / user perception surveys.
- Document the views in a comprehensible format suitable for comparison overtime; and
- Present the finding of the survey to senior decision makers in GoN / related agencies and the general public.

1.3 Scope of works

Present study had to be carried out on 1250 Km selected length of Strategic Road Network, District and Urban Roads selecting at least 50 service centers nationwide for the interaction with the users groups and other stakeholders; 25 such service centers having Average Annual Daily traffic of high traffic volume (more than 1500 vehicle per day), 15 service centers having AADT of moderate traffic volume (AADT between 250 – 1500 VPD) and 10 service centers having AADT of low traffic volume (AADT less than 250 VPD) each. The sections of roads were selected representatively in Hill and Terai; and five development regions.

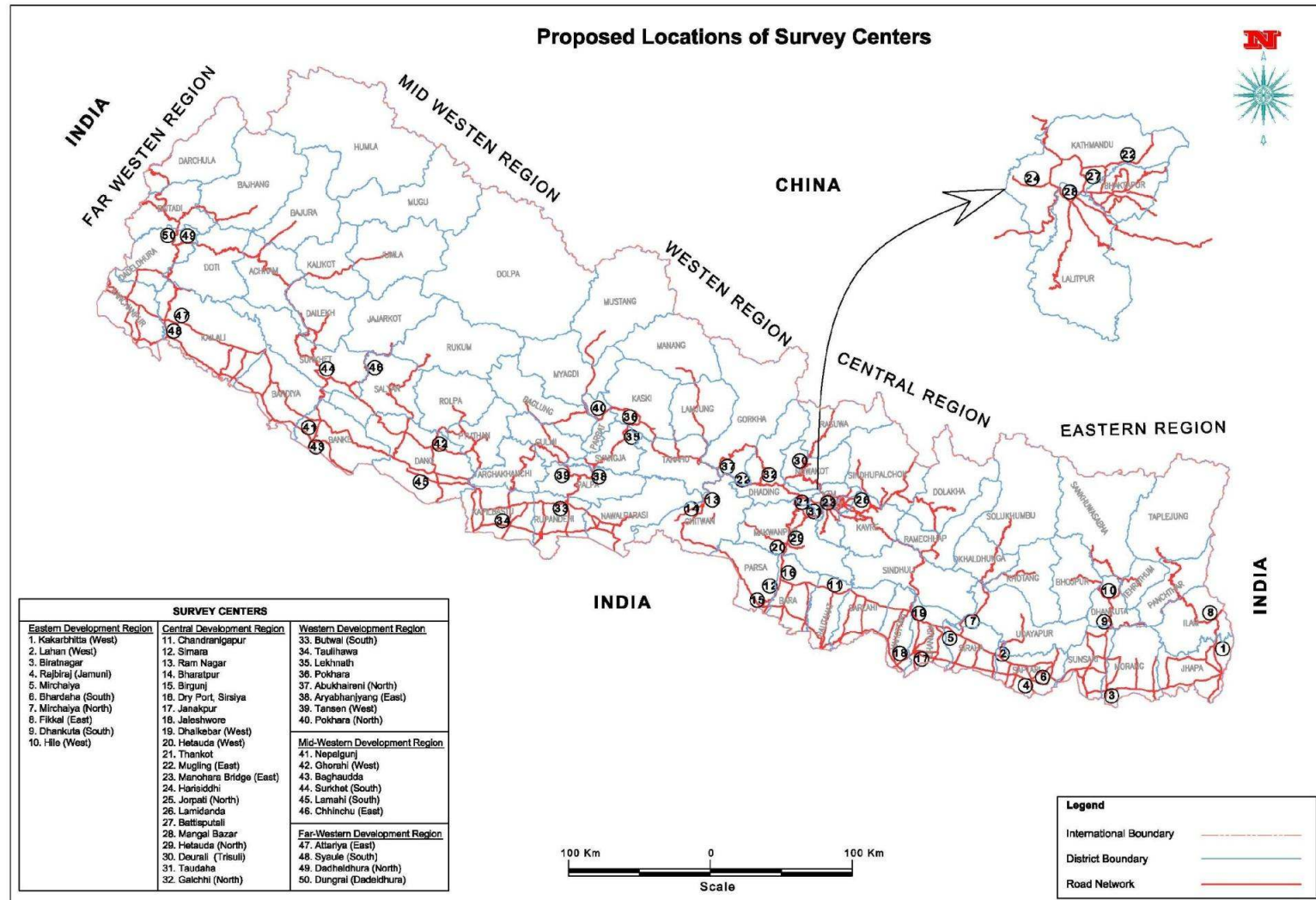
The service centers are listed in Table 1.1 and the Map of Nepal showing SRN with location of Service Centers is shown in the Figure 1.1

Table 1.1: Service Centers and Road Link Details

Region	Terrain	Ref.	Road-Link	Survey Center	Service Center Ref. No.
Eastern		H01	MRM (Kakarbhitta-Birtamode)	Kakarbhitta (West)	1
	Terai	H01	MRM (Lahan-Mirchaiya)	Lahan (West)	2
		UR	Biratnagar Municipal Roads	Biratnagar	3
		DR	Rajbiraj – Balan	Rajbiraj (Jamuni)	4
		DR	Lahan - Bhagwanpur	Mirchaiya	5
		F0301	MRM Bhardaha Rotary Towards Hanumannagar-Rajbiraj Road	Bhardaha (south)	6
		F7201	Mirchaiya – Katari Road (1Km North)	Mirchaiya (north)	7
	Hill	F38	Fikkal – Pahupati Nagar	Fikkal (east)	8
		H08	KRM (Dhankuta Bhedetar)	Dhankuta (south)	9
		DR	Hile - Bhojpur	Hile (West)	10
Total No. of Centers (East)				10	
Central	Terai	H01	MRM (Pathaliya-Chandranigahapur)	Chandranigahapur	11
		H02	TRP (Pathaliya-Birgunj)	Simara	12
		H05	MRM (Narayanghat North)	Ramnagar	13
		UR	Bharatpur City Roads	Bharatpur	14
		UR	Birgunj City Roads	Birgunj	15
		DR	Birgunj Thori	Dry Port, Sirsiya	16
		DR	Janakpur - Manaharpur	Janakpur	17
		DR	Jaleshwore - Matihani	Jaleshwore	18
		H0121	Ratubridge Dhalkebar - Nawalpur	Dhalkebar(west)	19
	Hill	H01	MRM (Hetauda-Narayanghat)	Hetauda (West)	20
		H02	TRP (Naubise-Kalimati)	Thankot	21
		H04	PRM (Mugling-Malekhu)	Mugling (east)	22
		H03	ARM (Manohara Bridge-Gatthaghar)	Manohara Bridge	23
		F24	Satdobato Jn-Goadavari (Satdabato-Harisiddhi)	Harisiddhi	24
		F27	Jorpati-Sundarijal	Jorpati (North)	25
		F30	Pachkhal – Melamchi (Lamidanda – Dadkhola)	Lamidanda	26
		UR	Kathmandu City Road	Battisputali	27
		UR	Lalitpur City Road (Pulchowk - Mangal Bazar)	Mangal Bazar	28
		H020SU	Samari Bridge (Hetauda-Bhainse)	Hetauda (North)	29

Region	Terrain	Ref.	Road-Link	Survey Center	Service Center Ref. No.
		DR	Trishuli-Deurali	Deurali (Trishuli)	30
		F2202	Chobhar-Dakshinkali Road	Taudaha	31
		F6901	Galchhi - Trishuli Road	Galchhi (North)	32
Total No. of Centers (Central)				22	
Western	Terai	H10	SRM (Butwal-Bhairahawa)	Butwal (South)	33
		DR	MRM Highway-Taulihawa	Taulihawa	34
	Hill	H04	PRM (Pokhara-Kotre)	Lekhnath	35
		UR	Pokhara City Road	Pokhara	36
		F35	Abukhaireni-Gorkha	Abukhaireni (North)	37
		DR	Aryabhanjyang -Rampur	Aryabhanjyang (East)	38
		F4301	Tansen-Ridhi-Tamghas	Tansen (West)	39
		F4201	Pokhara – Baglung at Yamdi Bridge	Pokhara (North)	40
Total No. of Centers (Western)				8	
Mid-Western	Terai	UR	Nepalgunj City Road	Nepalgunj	41
		F15	Ghorahi- Tulsipur	Ghorahi (West)	42
	Hill	DR	Nepalgung - Baghaudda	Baghaudda	43
		H12	RRM (Surkhet-Chhinchu)	Surkhet (South)	44
		DR	Lamahi - koilabas	Lamahi (South)	45
		F4701	Chhinchu - Jajarkot	Chhinchu (East)	46
Total No. of Centers (Mid Western)				6	
Far-Western	Terai	H01	MRM (Attariya-Junga)	Attariya (East)	47
		H1406	Attariya - Syaule	Syaule (South)	48
	Hill	H14	MKRM (Dadeldhura – Khodpe)	Dadeldhura (North)(49
		DR	Dadheldhura-Bagakot	Dungrai (Dadeldhura)	50
Total No. of Centers (far Western)				4	
Total No. of Survey Centers				50	

Figure 1: Map of Nepal Showing SRN with Location of Service Centers



2. STUDY APPROACH AND METHODOLOGY

2.1 General Approach

The Consultant followed a general approach to best achieve the objectives of the assignment by streamlining various activities and coordination of the concerned Target group particularly defined by RBN and practices adopted in past. The Consultant's team worked in close liaison and coordination with the RBN, DOR, DDC and municipalities and other concerned local agencies during the entire period of the assignment.

The following general approaches were pertinent and followed during the study period;

- Selection and utilization of those methods, procedures, guidelines and technologies which have been tested and proven to be optimum and successful in past similar exercise
- Application of an optimal combination of the methods and technologies based on practicability, clients requirement, and concerns of funding agencies with sound professional judgment.
- Full use of the technical, standards and procedures for data processing and analysis
- Full use of available and applicable reports, standards, data, forms, formats, guidelines and other relevant information for execution and completion of the proposed services in accordance with accepted professional standards and sound management practices.
- Full use of computer –based software(s) for data analysis, report preparation etc.
- Imparting knowledge on User's Satisfaction survey to the staff(s) of the Roads Board Nepal
- Close contact and effective co-ordination with the Roads Board Nepal inclusive of regular reporting of the progress of the assignment.
- Completion of the proposed services within the stipulated time and budget following the milestone as per Work Schedule.

Management Approach

The Consultant's management approach comprised of:

- Clearly defined roles and responsibilities for each member of the proposed Team.
- In-depth knowledge of sector and field of expertise at all times.
- Strict adherence to the work schedule and milestones.
- Sufficient flexibility to respond to desired changes and directions.
- Systematic procedures for quality control on field survey for data collection and analysis.
- Systematic monitoring of both processes and performance of the team members.
- Use of computer software(s) and tools associated with the proposed tasks.

Participatory Approach

The Consultant took the perception of the study as;

- An opportunity for capacity building and professional development of RBN officials. The Consultant initiated active and effective participation of the staff in all activities of its service delivery and transfer of knowledge/skill.
- A process to explore, identify and test further improvements in the methodology.

The Consultant tried best to meet the deadlines of all reporting schedule of the reports. During the implementation of the services, Consultant carried out internal progress monitoring and took up any corrective measures to delayed works with due diligence.

2.2 Review and Study of Previous Documents

Prior to beginning the survey work, the following information and document which were relevant to the present study were collected, studied and reviewed:

- All the previous study reports on road users' satisfaction done by RBN, other road agencies, government and non-governmental organizations, individuals, media collection etc. These included:
 - Road-User Satisfaction Survey-I, 2006; Roads Board/Nepal.
 - National Road Users' Satisfaction Survey (NRUSS) Annual Report 2010/11, Highway Agency, UK.
 - Road-User Satisfaction Survey in the state of Himanchal Pradesh, India (2007); Himanchal Pradesh Road and Other Development Corporation Ltd. (HPRIDC), India.
 - Second Road-User Satisfaction Survey in Karnataka, India (2004); Karnataka State Highway Improvement Project, Public Works Dept./State Govt. of Karnataka, India.
 - Road-User Satisfaction Survey in the state of Tamilnadu, India (2007);
 - State User Survey 2003; Transit New Zealand.
- Road Condition data on surface distress, traffic count, road accident and closer, maintenance approach and its frequency on various road network; which mainly include:
 - Statistics of Strategic Roads of Nepal 2004, 2007, 2011/12, DOR /GON
 - Traffic Count Survey on SRN, 2011/12, HMIS Unit, DOR /GON
 - Traffic Count Survey 2004/05 of strategic roads, RMDP1, DOR /GON
 - District Selection Criteria and Recommended Districts, 2003, RAIDP, DOLIDAR/GON
- Organizational or the structural set up of all the agencies responsible for road construction and maintenance; and their concerns, issues and constraints, such as budgetary provisions, fiscal regulations, supervisory and quality control mechanisms, maintaining a balance between new road construction and maintenance of existing road network etc. Organizations responsible for road construction and maintenance mainly include;
 - Department of Roads, MoPPW, GON, Nepal.
 - Department of Rural Infrastructures and Agricultural Roads, MoLD, GON, Nepal.
 - District Development Committees, MoLD, GON, Nepal and
 - Municipalities, Nepal

2.3 Planning Phase

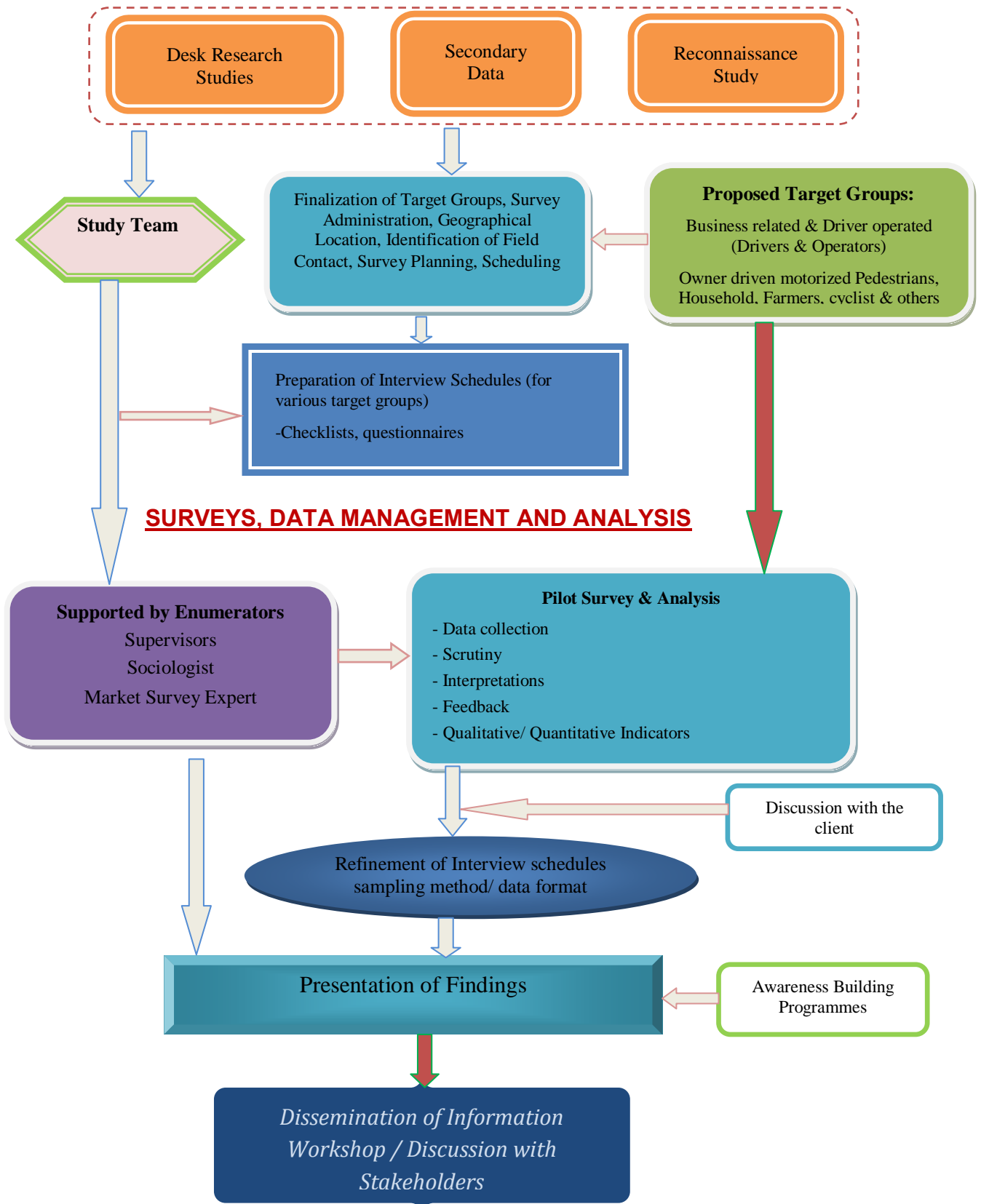
It was in the initial phase that the full progression of the study was decided. The preliminary data useful for the study had been collected referring to the study of various related documents and previous studies and the required field data were collected during the field visit. The tasks included:

- Determination of sample size and its distribution to focused target group in each service centers covering all five development regions in hill and Tarai areas
- Selection of sample road sections and their lengths covering all five development regions in Hill and Tarai areas.
- Finalization of target groups and survey methodology,
- Development of Questionnaires/checklists and preparation of interview schedules,
- Output formats for data processing
- Reporting formats etc.

2.4 Field Data Collection & Analysis

The field surveys were carried out with the help of the outputs from the planning stage. The study and analysis of the collected data were also carried out using the specific set of programs. The survey findings are generated and report prepared in the present form.

Fig. 2.1.: Schematic Chart for the Study Approach



2.2 Sample Design

2.2.1 Identification of Road Users, Target Group

The research study had identified Road Users, Target Group and Stakeholders in three categories for the present survey as:

- Motorized Traffic, which are categorized as Main Users
- Non-Motorized Traffic, which are categorized as Vulnerable Users
- Traffic related organizations/associations

The Table 2.1 below lists the various classifications of user groups under the three Target Groups.

Table 2.1 Target /Users Group for Survey

Target / User Groups		
Main Users (Motorized Traffic)	Vulnerable Users (Non Motorized)	Traffic related Organizations/Associations
- Truck / Tanker Drivers	- Pedestrians	- Transport Entrepreneur (Yatayat Byabsai Sangh)
- Light Commercial Vehicles	- Cyclists	- Truck / Tanker Operators/associations
- Bus Drivers	- Rickshaw puller	- Bus Operators
- Taxi / Hired Car Drivers	- Bullock/hand driven carts	- Farmers/agricultural producers
- Two wheeler drivers	- Farmers	- Chamber of commerce
- Tractor Drivers	- Pilgrims/tourist	- Industrial manufacturers
- Passengers	- Market consumers	- Traders
	- Households adjacent to main Road	- Insurance Representatives
		- NGOs involved in social and - Environmental issues
		- Journalists and media representatives
		- Government institutions
		- Traffic Police

From the pool of user groups under Associations, efforts had been made to cover as many groups as possible. Interaction/interview with the Pedestrians, Cyclists, Bullock cart drivers and Cart pullers was organized separately. For group discussion, similar users were grouped together.

2.2.2 Development of Questionnaires and Checklists

This was the most crucial stage to elicit the customer perceptions of road outcome and road agencies performance. For this purpose, a set of questionnaires for different categories of road users were developed. Development of questionnaires helped to guide the consultant personnel in collecting road user's views in transparent and unbiased manner; and select appropriate user to be interviewed. For ease of responding interviewee's perceptions, questionnaires were made as objective and practicable as possible with a number of possible options to each question. Sample questionnaires are given in Appendix I.

2.2.3 Traffic Data

Traffic count survey data conducted by DoR in 2011/12 covering 160 stations on SRN were available as given in Annex. However the traffic data for other roads were not available since 2004. Therefore the traffic data for DR and UR were taken from nearby station on judgmental basis with due consideration of possible traffic diversion.

2.2.4 Estimation of Sample Size

The required sample sizes for different road users were computed considering the confidence limit at 95% error margin. The traffic data of service centers in the Kathmandu valley were very high as compared to outside service centers. So, the sample size for outside valley had been calculated based on the respective traffic data whereas the sample size for Kathmandu valley had been fixed on judgment. The sample size for farmers, households adjacent to road and pedestrians were fixed on judgmental basis as there were no traffic data of these variables.

The sample sizes at different types of users for different service centers were allocated proportionately based on their total traffic volume and its composition. The minimum sample size was fixed to five for different users if it was lower than five. In the case of farmers, the sample sizes were allocated equally to all the sample service centers.

Further, the samples for households adjacent to roads and pedestrians were allocated equally except in Kathmandu Valley, where the sample size was slightly increased as compared to outside valley due to heavy traffic. Thus the total sample size for the proposed Users Satisfaction Survey-II was initially estimated and planned to 2773, which included the road users selected for structured interviews (2526 numbers) and the others selected for IDI and FGD. After the completion of the field survey, the actual sample size has come to 2850 in total; 2603 for SI and 250 for IDI and FGD.

2.2.5 Distribution of Sample Size

The total sample size used for SI in the present survey has further been distributed at different service centers region wise for different types of road users as given in table 2.2 (a). Distribution of total sample size selected for IDI and FGD is given in table 2.2 (b) in terms of target group and research technology.

Table 2.2(a): Distribution of Sample by Service Centre and Types of Road Users for SI

Region	Terrain	Center No.	Ref. No.	Survey Center	Road Type	Truck	Inter-urban	Taxi, hired cars	utility	Tractors	3 Wheelers, Rickshaws	Households	Farmers	Pedestrians	Total
Eastern	Terai	1	H01	Kakarbhitta (West)	S R	15	13	18	5	9	7	6	10	7	90
		2	H01	Lahan (West)	S R	18	10	0	7	10	9	6	5	10	75
		3	UR	Biratnagar	U R	0	5	5	5	5	7	13	0	12	52
		4	DR	Rajbiraj (Jamuni)	D R	0	0	0	0	5	0	6	9	0	20
		5	DR	Lahan (east Thori Road)	D R	5	0	0	0	5	0	7	9	0	26
		6	F0301	Bhardaha (south)	S R	7	5	5	0	0	0	5	5	6	33
		7	F7201	Mirchaiya (north)	S R	6	5	0	0	0	0	0	5	7	23
	Hill	8	F38	Fikkal (east)	S R	5	5	9		5	0	6	9	6	45
		9	H08	Dhankuta (south)	S R	5	5	5		0	0	5	9	6	35
		10	DR	Hile (West)	D R	5	5	0	0	0	0	6	9	5	30
Central	Terai	11	H01	Chandraniga hapur	S R	27	15		5	9	0	6	9	6	77
		12	H02	Simara	S R	29	19		6	11	0	6	9	6	86
		13	H05	Ramnagar	S R	8	16	13	8	0	0	6	9	6	66
		14	UR	Bharatpur	U R	0	0	5	5	5	7	13	0	13	48
		15	UR	Birgunj	U R	0	0	0	5	6	7	13	0	13	44
		16	DR	Dry Port, Sirsiya	D R	5	5	0	0	0	5	6	9	7	37
		17	DR	Janakpur	D R	5	5	0	0	5	5	6	9	0	35
		18	DR	Jaleshwore	D R	5	5	0	0	5	0	6	9	0	30

Region	Terrain	Center No.	Ref. No.	Survey Center	Road Type	Truck	Inter-urban	Taxi, hired cars	utility	Tractors	3 Wheelers, Rickshaws	Households	Farmers	Pedestrians	Total
Western	Hill	19	H0121	Dhalkebar (west)	S R	26	9	0	5	0	0	14	9	12	75
		20	H01	Hetauda (West)	D R	28	10	0	0	8	5	8	8	7	74
		21	H02	Thankot	S R	25	15	5	5	0	0	13	9	13	85
		22	H04	Mugling (east)	S R	28	14	15	6	0	0	6	9	9	87
		23	H03	Manohara Bridge	S R	9	19	31	21	0		13	9	13	115
		24	F24	Harisiddhi	S R	7	11	17	5	0	0	11	9	13	73
		25	F27	Jorpati (North)	S R	6	10	10	5	0	0	13	9	13	66
		26	F30	Lamidanda	S R	0	5	0	5	0	0	6	9	6	31
		27	UR	Battisputali	U R	0	0	24	15	0	9	13	0	13	74
		28	UR	Mangal Bazar	U R	0	0	25	17	0	8	13	0	15	78
		29	H020 SU	Hetauda (North)	S R	27	13	0	6	0	0	15	10	10	81
		30	DR	Deurali (Trishuli)	D R	5	6	0	0	0	0	0	9	6	26
		31	F2202	Taudaha	S R	6	5	6	6	0	0	10	6	5	44
		32	F6901	Galchhi (North)	S R	5	6		5	5	0	5	7	8	41
Western	Terai	33	H10	Butwal (South)	S R	5	18	19	8	6	18	6	9	13	102
		34	DR	Taulihawa	D R	5	5	0	0	5	7	0	9	6	37
	Hill	35	H04	Lekhnath	S R	11	11	30	5	5	0	6	0	14	82
		36	UR	Pokhara	U R	0	7	5	5	0	0	6	0	13	36
		37	F35	Abukhaireni (North)	S R	5	5		5	5	0	6	9	12	47
		38	DR	Aryabhanjyang (East)	D R	5	5	0	0	0	0	0	9	5	24
		39	F4301	Tansen (West)	S R	7	6		5	0	0	10	6	7	41
		40	F4201	Pokhara (North)	S R	9	9	8	6	5	0	9	10	10	66
Mid-Western	Terai	41	UR	Nepalgunj	U R	0	0		5	5	7	6	0	12	35
		42	F15	Ghorahi (West)	S R	5	9		8	7	0	6	9	6	50
	Hill	43	DR	Baghaudda	D R	0	5	0	0	5	0	0	9	6	25
		44	H12	Surkhet (South)	S R	5	5	0	5	9	0	6	9	6	45
		45	DR	Lamahi (South)	D R	0	5	0	0	5	0	0	9	6	25
		46	F4701	Chhinchu (East)	S R	5	5			0	0	5	6	7	28

Region	Terrain	Center No.	Ref. No.	Survey Center	Road Type	Truck	Inter-urban	Taxi, hired cars	utility	Tractors	3 Wheelers, Rickshaws	Households	Farmers	Pedestrians	Total
Far-Western	Terai	47	H01	Attariya (East)	S R	5	8	5	5	7	9	7	9	6	61
		48	H140 6	Syaule (South)	S R	5	7			7	0	5	8	9	41
	Hill	49	H14	Dadeldhura (North)	S R	5	5	0	0	0	0	7	9	6	32
		50	DR	Dungrai (Dadeldhura)	D R	5	0	0	0	5	0	0	8	6	24
		50		Total No (all types)		399	356	260	204	169	110	347	355	403	2603
District Roads (DR)						45	46	0	0	40	17	37	107	47	339
Urban Roads (UR)						0	12	64	57	21	45	77	0	91	367
Strategic Roads (SR)						354	298	196	147	108	48	233	248	265	1897

Table 2.2 (b): Sample Selection for IDI and FGD

SN	Target Group	Research Technique	Sample Size
1	Transport Entrepreneur (Yatayat Byabsai Sangh)	IDI	12
2	Truck / Tanker Operators/associations	IDI	22
3	Inter-urban service Operators	IDI	24
4	Taxi, hired car, Rickshaw operators	IDI	16
5	Chamber of commerce/ Industrial manufacturers/Traders	IDI	24
6	Private car owners associations	IDI	6
7	Insurance Representatives	IDI	7
8	NGOs involved in social and environmental issues	IDI	16
9	Vehicle including Bicycle, manufacturers, repair workshop representatives	IDI	17
10	Government institutions	IDI	5
11	Traffic Police	IDI	20
12	Freight forwarding/ Shipping agents	IDI	6
13	Academician, Journalists, Media representatives	IDI	35
Sub Total			210
14	Truck / Tanker Operators/associations	FGD	6
15	Inter-urban service operators	FGD	6
16	Taxi, hired car, Rickshaw operators	FGD	6
17	Households	FGD	22
Sub Total			40
Total			250

2.2.6 Selection of Service Centres for Survey

Service centers for survey together with the road link were already identified and given in ToR as presented in Table 2.1 above. Proposed service centers cover both Hilly and Terai geographical terrain in all five development regions of Nepal.

Region-wide distribution of service centers with different geographical coverage and different categories of roads is given in Table 2.3.

Table 2.3 Region-wise distribution of Service Centers

Region	Terai				Hill/Rolling				Total
	SRN	DR	UR	Sub-total	SRN	DR	UR	Sub-total	
Eastern	4	2	1	7	2	1	0	3	10
Central	5	3	3	11	8	1	2	11	22
Western	1	1	0	2	4	1	1	6	8
Mid Western	0	2	1	3	3	0	0	3	6
Far Western	1	0	0	1	2	1	0	3	4
Total	11	8	5	24	19	4	3	26	50

2.3 Distribution of Road Network in Nepal

Region-wise distribution of total road network in Nepal constituting SRN, district and urban roads with different geographical coverage and different categories of roads is given in Table 2.4.

Total length of strategic road network was taken from 'Statistics of Strategic Road Network, SSRN 2011/12'. Authentic statistics of district and urban road lengths for 2011/12 were unavailable, but, they were available for 2004 (Road Statistics, 2004). Therefore, the current lengths for 2011/12 have been calculated in proportionate to the increase in SRN lengths.

Table 2.4 Region-wise Road Lengths of different Categories

Region	Road Length (Km.)								Total
	Hill/Rolling terrain				Terai				
	SRN	DR	UR	Sub-total	SRN	DR	UR	Sub-total	
Eastern	1329.36	674.46	75.25	2079.07	1240.7	1647.61	610.88	3499.19	5578.26
Central	2069.90	2008.75	927.06	5005.71	1103.14	2587.56	806.60	4497.30	9503.01
Western	1659.95	1605.00	625.08	3890.03	590.53	407.12	132.77	1130.42	5020.45
Mid Western	1504.27	801.53	56.15	2361.95	804.05	687.18	70.12	1561.35	3923.30
Far Western	868.66	181.59	15.61	1065.85	465.02	452.89	67.08	984.99	2050.84
Total	7432.14	5271.33	1699.15	14402.62	4203.44	5782.36	1687.44	11673.25	26075.86
Distribution of lengths	29%	20%	7%	55%	16%	22%	6%	45%	100%

Source: Statistics of Strategic Road Network, SSRN 2011/12 for SRN.
Road length of DR and UR are available for 2004 (Road Statistics, 2004). Current lengths for 2011/12 have been calculated in proportionate to the increase in SRN lengths.

2.3.1 Distribution of Sample Roads

Region wise distribution of sample road length of 1250 km. covering SRN, district and urban roads with different geographical coverage and different categories of roads with respect to the total road lengths as given table 2.4 was calculated as given in Table 2.5.

Table 2.5 Distribution of Survey Length for different categories of roads

Region	Road Length for survey (Km.)								Total
	Hill/Rolling terrain				Terai				
	SRN	DR	UR	Sub-total	SRN	DR	UR	Sub-total	
Eastern	63.73	32.33	3.61	99.66	59.48	78.98	29.28	167.74	267.41
Central	99.22	96.29	44.44	239.96	52.88	124.04	38.67	215.59	455.55
Western	79.57	76.94	29.96	186.48	28.31	19.52	6.36	54.19	240.67
Mid Western	72.11	38.42	2.69	113.22	38.54	32.94	3.36	74.85	188.07
Far Western	41.64	8.70	0.75	51.09	22.29	21.71	3.22	47.22	98.31
Total	356.27	252.69	81.45	690.42	201.50	277.19	80.89	559.58	1250.00
Distribution of lengths	29%	20%	7%	55%	16%	22%	6%	45%	100%

2.3.2 Selection of Sample Road Section for Survey

Sample road length for survey was randomly selected in proportion to the total road length covered by each category of roads based upon traffic density (as given in the ToR) with the total sample survey length of 1250 Km. and it is represented hill and Terai; and all five development regions.

The sampling frame for the survey was 1250 Km of selected roads all over Nepal covering Strategic Road Network, District Rural Roads and Urban Roads as per the classification based on Nepal Road Standards. Within this stretch of roads, 50 service centers (as required by the TOR) were selected for the interaction with users groups and stakeholders. Table 2.6 below illustrates the region wise distribution of sample road lengths for Hill and Terai regions.

Out of 50 such service centers 25 centers were selected in road sections having Average Annual Daily Traffic of High Volume (AADT more than 1500 vehicles per day), 15 service centers were selected from the road sections having AADT of moderate traffic (AADT between 250-1500 VPD) and remaining 10 service centers for road sections having low (less than 250 VPD) traffic volume.

Region wise distribution of total survey length of 1250 km. at different service centers with each of the above traffic band in Hill and Terai is given in table 2.6

Table 2.6 Region-wise Sample Roads Distribution

Region	Terrain	Traffic Volume									
		AADT >1500 Vpd			AADT 250 - 1500 Vpd			AADT <250 Vpd			
		Road Ref No.	Road Link	Survey Length (Km.)	Road Ref No.	Road Link	Survey Length (Km.)	Road Ref No.	Road Link	Survey Length (Km.)	
Eastern	Hill	H01	MRM (Kakarbhitta-Birtamode)	17							
		H01	MRM (Lahan-Mirchaiya)	28							
		UR	Biratnagar Municipal Roads	25							
								DR	Rajbiraj – Balan	18	
						DR	Lahan - Bhagwanpur	18			
						F0301	MRM Bhardaha Rotary Towards Hanumannagar -Rajbiraj Road	18			
					F7201	Mirchaiya – Katari Road (1Km North)	27				
	Terai										

Region	Terrain	Traffic Volume								
		AADT >1500 Vpd			AADT 250 - 1500 Vpd			AADT <250 Vpd		
		Road Ref No.	Road Link	Survey Length (Km.)	Road Ref No.	Road Link	Survey Length (Km.)	Road Ref No.	Road Link	Survey Length (Km.)
	Hill				F38	Fikkal – Pahupati Nagar	11			
					H08	KRM (Dhankuta Bedetar)	37			
								DR	Hile - Bhojpur	26
Sub-total: East				70			111			44
Central	Terai	H01	MRM (Pathalaiya-Chandranigapur)	40						
		H02	TRP (Pathalaiya-Birgunj)	22						
		H05	MRM (Narayanghat North)	36						
		UR	Bharatpur City Roads	35						
		UR	Birgunj City Roads	5						
					DR	Birgunj Thori	25			
					DR	Janakpur - Manaharpur	5			
					DR	Jaleshwore - Matihani	7			
		H0121	Ratubridge Dhalkebar - Nawalpur	34						
		H01	MRM (Hetauda-Narayanghat)	78						
	H02	TRP (Naubise-Kalimati)	25							
	H04	PRM (Mugling-Malekhu)	40							
	H03	ARM (Manohara Bridge-Gathaghar)	4							
	F24	Satdobato Jn-Goadavari (Satdabato-Harisiddhi)	2							
	F27	Jorpati-Sundarijal	7							
				F30	Panchkhal – Melamchi (Lamidanda – Dadkhola)	10				
	UR	Kathmandu City Road (Baneshwor - Battisputali)	2							
	UR	Lalitpur City Road (Pulchowk - Mangal Bazar)	2							
	Hill	H020SU	Samari Bridge	11						

Region	Terrain	Traffic Volume									
		AADT >1500 Vpd			AADT 250 - 1500 Vpd			AADT <250 Vpd			
		Road Ref No.	Road Link	Survey Length (Km.)	Road Ref No.	Road Link	Survey Length (Km.)	Road Ref No.	Road Link	Survey Length (Km.)	
			(Hetauda-Bhainse)								
							DR	Trishuli-Deurali		10	
		F2202	Chobhar-Daashinkali Road	13							
					F6901	Galchhi - Trishuli Road	22				
Sub-total: Central				356			64			15	
Western	Terai	H10	SRM (Butwal-Bhairahawa)	22							
								DR	MRM Highway-Taulihawa	14	
		H04	PRM (Pokhara-Kotre)	20							
	Hill	UR	Pokhara City Road	35							
						F35	Abukhaireni-Gorkha	25			
									DR	Aryabhanjyang -Rampur	25
		F4201	Pokhara – Baglung at Yamdi Bridge	18		F4301	Tansen-Ridhi-Tamghas	76			
Sub-total: Western				95			101			39	
Mid Western	Terai	UR	Nepalgunj City Road	5							
								DR	Nepalgunj - Baghaudda	25	
								DR	Lamahi - Koilabas	15	
	Hill					F15	Ghorahi-Tulsipur	24			
						H12	RRM (Surkhet-Chhinchu)	26			
					F4701	Chhinchu - Jajarkot	78				
Sub-total: Mid-western				5			128			40	
Far Western	Terai	H01	MRM (Attariya-Junga)	64							
	Hill				H1406	Attariya - Syaule	114				
								H14	MKRM (Dadeldhura – Khodpe)	27	
							DR	Dadeldhura-Bagakot	7		
Sub-total: Far-western				64			84			34	
Total length for Survey (Km.)		25 Nos.		590		15 Nos.		488		10 Nos.	172

2.4 Selection of Respondents

Each of the road users had different perceptions of road network outcomes/attributes and agencies performance. It was therefore, proposed to include all types of road users in the survey process. Depending upon the sample size and the methodology adopted for survey, i.e. SI or IDI or FGD, each of the respondents for SI was planned to be randomly selected, say every 4th or 5th respondent for each target group. However, this approach varied from one place (service center) to another depending upon their frequency and availability for gathering information. Respondents for IDI and FGD were selected in such a way that the maximum information was obtained which carried factual significance for the purpose of the present study.

2.5 Identification of Indicators and Sub-indicators

During the survey, the consultant were seek to elicit the respondents' perception on road network outcome/attributes and road agencies performance on the following aspects and accordingly the questionnaires were developed. The major indicators with respective sub-indicators were as follows:

Road Conditions & Perceived Impact

- Road Conditions/Physical Features
- Traveling Time
- Fuel cost
- Maintenance cost
- Reliability of travel

Comfort & Convenience

- Congestion on Roads and Reasons for Discomfort
- Road width
- Information on Road Works
- Comfortability while commuting on roads
- Accessibility to Settlements
- Irritating Factors
- Road Markings & Distance Signs
- Cause and Extent of Delays

Safety Aspects

- Is Commuting in Nepal Safe Enough?
- Reasons for Feeling Unsafe
- Accident Management
- Safety Design
- Warning/ Road Signs
- Availability of Police Posts and Display of Emergency Signs

Travel Amenities & Visual Appeal

- Availability of Amenities
- Satisfaction (if availed) with Amenities
- Availability of Petrol Pumps
- Availability of parking facilities
- Availability and Satisfaction with Medical Facilities
- Satisfaction with Roadside Plantation
- Suggestions for Beautification of Roads

Perception about Road Agencies

- Awareness of Road Agencies for Maintenance

- Road Improvement and Maintenance Scheme
- Perception about Road Agencies mainly DoR, DoLIDAR, DDC, Municipality
- DoR vs Local Road Development Agencies
- Complaint Redressal System & Response Time

Priorities for Improvement

- Priorities for Improvement
- Priorities for Better Road Management
- Priorities for better road services

Overall Satisfaction

- Road Users' Satisfaction Level- Based on Type of Road
- Overall Satisfaction – Geographical terrain type wise (Hill/Terai)
- Road Users' Satisfaction – region wise
- Development of Road Users' Satisfaction Index (RUSI)

2.6 Survey Guidelines

The consultant shaped up the survey methodology and guidelines covering the conduction of field survey of the selected sample/unit/agency. The guideline covered how to start question/survey i.e. simple questions at the beginning and hard questions towards the end, for historical data followed in chronological order, asking one topic at a time, using transition question when switching from one topic to another, etc. Apart from these it also listed what to do and what not to do during the survey with respondent like; thanking him/her before start and at the end of completion, keep survey short and simple, being sensitive to the needs of the respondent, be alert on respondent being uncomfortable, etc.

The survey methodology included various issues and processes as mentioned earlier like sample size, selection of road sections, selection of service centers, sample size allocation, selection of respondents etc. including sample questionnaires etc. Furthermore it contained survey tools to be used for various respondents like structured interview, in depth interview and focused group discussion.

Annex-1 of the ToR provided the list of various respondents. Based on this list, the consultant had proposed the survey tools to be applied for each category of potential respondents, as shown in the Table 2.7 below.

Table 2.7 Survey Tools to be applied

SN	Respondents	Survey Tools		
		SI	IDI	FGD
1	Truck and tanker operator and drivers	√	√	√
2	Inter-urban service operators and drivers	√	√	√
3	Tempo, rickshaw, taxi and hired car operators and drivers	√	√	√
4	Private car owner associations		√	
5	Households living adjacent to main roads	√		√
6	Farmers/ agricultural commodity producers	√	√	
7	Chambers of commerce, industrial manufacturers and traders		√	
8	Freight forwarding/ shipping agents		√	
9	Insurance industry representatives		√	
10	Vehicle, including bicycle, manufacturers and repair workshop representatives		√	
11	NGOs involved with social, environmental issues related to roads plus vulnerable groups such as the disabled		√	

SN	Respondents	Survey Tools		
		SI	IDI	FGD
12	Academician, journalists and media representatives		√	
13	Pedestrians	√		

Note: **SI**: Structured Interview, **IDI**: In Depth Interview, **FGD**: Focus Group Discussion

2.7 Pilot Survey

2.7.1 Coverage of Pilot Survey

The pilot survey was essential to test the survey methodology as well as fine tune the proposed methodology and research instruments proposed. The output of the pilot survey had led to administering the main survey with higher confidence level in the data/ information thus generated.

The coverage details for the pilot survey in terms of research technique for each category of road users groups is given in Table 2.8, which was later covered during the main survey.

Table 2.8: Coverage for Pilot Survey by Research Technique and Target Group

S. No.	Target Group	Research Technique
1.	Truck, Tanker operator/driver	Structured Interview
2.	Bus Service operator/drivers – Pvt.	Structured Interview
3.	Bus drivers	Structured Interview
4.	Auto, Taxi, Hired Car operators/drivers	Structured Interview In depth interview
5.	Households living adjacent to road	Structured Interview
6.	Private car owner's association	In depth interview
7.	Farmers/Agriculture Commodity Producers	Structured Interview In depth interview
8.	Chamber of Commerce/Trader/Manufacturer	In depth interview
9.	Freight forwarding shipping agents	In depth interview
10.	Insurance Industry Representatives	In depth interview
11.	Emergency Services Representatives	In depth interview
12.	Vehicle, bicycle repair workshop	In depth interview
13.	Ambulance Provider/drivers	In depth interview
14.	NGOs involved in Social, Environmental issues related to roads and vulnerable groups	In depth interview
15.	Academicians	In depth interview
16.	Journalist/Media Representatives	In depth interview
17.	Pedestrians	In depth interview
18.	Cyclists	In depth interview
19.	Consultant	In depth interview
20.	Civil contractor	In depth interview
21.	Traffic Police	In depth interview

2.7.2 Service Centre for Pilot Survey

The consultant conducted pilot survey at Harisiddhi Service Center (Lalitpur), representing the strategic road network having AADT of moderate traffic volume (AADT 200 between 1500 vehicles per day) and also represented non-homogeneity of the respondents. Pilot survey outcome enabled

the consultant to modify the survey methodology and fine tune the questionnaires as needed to fulfill the required objective of the study.

2.7.3 Data Analysis

The Pilot survey data were documented and analyzed with respect to:

- Sample size allocated
- Consistency and accuracy of data
- Survey methodology and tools adopted
- Competency of supervisors and enumerators
- Consistency and usefulness of questions, checklists etc.

2.8 Administration of Main Survey

2.8.1 Coverage for Main Survey

The coverage details for the main survey in terms of type of segment, research technique for each category of the road user groups is given in Table 2.9, which was covered during the research survey.

Table 2.9 Coverage for Main Survey by Research Technique and Target Group

S. No.	Target Group	Research Technique
1	Truck/tanker driver	Structured interview
2	Private Bus Driver	Structured interview
3	Taxi/hired car driver	Structured interview
4	Auto driver	Structured interview
5	Car owner/user	Structured interview
6	Two wheeler owner/user	Structured interview
7	Household	Structured interview
8	Farmer/agricultural producer	Structured interview
9	Heavy Equipment operator	In depth interview
10	Urban (private) bus operator	In depth interview
11	Taxi, hired car operator	In depth interview
12	Private car owner association	In depth interview
13	Chambers of Commerce	In depth interview
14	Industrial manufacturers and traders	In depth interview
15	Insurance Company Representatives	In depth interview
16	Vehicle including bicycle, repair workshop representatives	In depth interview
17	NGOs	In depth interview
18	Academicians	In depth interview
19	Journalists/media representatives	In depth interview
20	Professional bodies of engineers (e.g. Institution of engineers)	In depth interview
21	Motor driving schools approved by Govt.	In depth interview
22	Civil Engineering Contractors Association	In depth interview
23	Local bodies – Municipalities and Municipal Corporation	In depth interview

S. No.	Target Group	Research Technique
24	Local Area Development Authorities	In depth interview

2.8.2 Survey Team

The survey team was headed by one field supervisor with the enumerators. The study professionals had also visited the site frequently and made efforts to improve the quality of the survey works. During the field, the professionals conducted in-depth interview with representatives of chamber of commerce, transport association, traders, municipality etc.

2.8.3 Training of field supervisors and enumerators

The methods used to impart training included lectures by experts, group discussion, explanations of questionnaires, demonstration interviews and field practice interviews. Before the start of the survey, the consultant selected enumerators to conduct the survey with required qualification and experience.

The issues that needed to be addressed during the training were for example:

- Locating, enlisting and soliciting cooperation from respondents
- Motivating respondents to properly provide information
- Clarifying any confusion/concern
- Observation of quality of responses and
- Conducting good interview etc.

Similarly, the other aspects that needed to be addressed were:

- Describing the entire study
- Stating who is the sponsor of the study
- Educating about the survey tools
- Explaining sampling logic and process
- Explaining interviewer biasness
- Walking through the interview, explaining respondents selection procedures
- Rehearsing the interview
- Explaining about the supervision and
- Explaining the schedule by which the exercise was to be completed

2.8.4 Category of Respondents

Truck and tanker drivers

The allocated sample for truck and tanker operators was further distributed on the basis of their traffic flow; say every 10th truck and every 5th tankers. Information on origin, destination, and volume of goods transported (over-load/under load), road side facilities, road side traffic signals, road conditions, travel time, socio-economic information of drivers etc. were generated using structured questionnaire.

Inter-urban service drivers

The allocated sample for inter-urban service operators (long route bus and minibus) was further reallocated on the basis of their traffic flow. Every 10th bus and every 5th minibus was selected for survey purpose. Information on origin, destination, number of passenger seats, passenger travel (over load/under load)/number of passenger travel (over capacity/under capacity), road side

facilities, road side traffic signals, road condition, travel time, socio –economic information of the drivers etc. were generated using structure questionnaire.

Taxi, hired cars, tractor and Utility cars drivers Questionnaire

The taxi and hired car and utility cars drivers were allocated among different groups according to the commodities transported. The sample of such vehicles was selected at an interval of 10 and the information was collected through structure interview. Information on commodities transported, quantity, origin, destination, most frequently used route, number of passenger travel (overcapacity/ under capacity), road side facilities, road side traffic signals, road conditions, travel time, socio-economic information of drivers etc. were generated using structured questionnaire.

Households

The households living adjacent to the road side were selected to generate the information on the road side pollution (sound, smoke, and dust), vehicle speed, behavior of the vehicle operators and safety consideration. Every 10th house of both side of urban road was selected for interview purpose. In the case of strategic and district roads, the cluster of house was selected and interviewed one after another on the both side of the road as most of the houses of strategic and district road are concentrated on service centers.

Farmers/agricultural commodity producers

Farmers/agricultural commodity producers coming to sell their products or purchase necessary commodities were selected randomly to generate the information on their commodity produced, volume of inputs, selling price of agriculture commodities, transport charge and transport charge of inputs including their origin and destination.

Pedestrians

Pedestrians walking along the road of the selected service center were selected one out of 50 in urban roads and one out of 20 in districts and strategic roads which was adjusted as needed during the field survey. Information on roads such as zebra crossing, road quality, foot-paths, culvert, water logging, humps, ditches, road lights, behaviors of the vehicle operators etc. were collected using structure questionnaires.

2.8.5 Execution of Field Survey

Structured Interview

Structured questionnaires were used for interview for those respondent groups as identified and suggested in table 2.7. Field supervisors randomly checked the survey works carried out by the field enumerators during the structured interview process. Time frame allocated and the methodology adopted was adhered to conduct those interviews. No major deviations were entertained during the survey, which were necessary in order to harmonize the data collected across all the 50 service centers.

In Depth Interview

In Depth interview was conducted by the Key Exports, and in some cases through adequately trained supervisors. The questionnaires developed for this purpose were utilized during the interview. No major deviations were entertained during such interviews as well.

Focus Group Discussion

Focused group discussion with selected group as outlined in Table-2.7 was conducted by key professionals i.e. Team Leader and Sociologist. FGD elicited the information on qualitative basis on various aspects of the study objectives i.e. concentrating on road users' satisfaction and in line with the major indicators and sub-indicators.

FGD checklists along with semi-structured questionnaire were also used to conduct the FGD among the various target groups/respondents. Focus group output was also be used to triangulate the information provided through structured and in-depth Interviews.

2.9 Data Management and Analysis

2.9.1 Data Documentation and Evaluation

The consultant compiled and organized the data collected from main survey, other primary sources and from the secondary sources as per the requirement of the study for easy reference and analysis.

All the structured questionnaires were pre-coded for easiness in the data entry, output generation and analysis. During this process data were validated and checked for consistency and reliability. Inconsistent and unreliable data were omitted during the final entry into the database. Hence at this stage the Consultant reviewed, collated, sorted and cleaned the data gathered from field survey.

The quantitative data/information were documented using software packages (Microsoft Access 10), whereas the qualitative data/information were documented in electronic form using word processing software and Spreadsheet Program, whichever was suitable.

Data Entry in Computer Software

Input format for data entry was designed and tested to enter the coded data. Data Entry Operators was trained to enter the data. Statistician was supervised the works during coding and data entry processes.

2.9.2 Data Processing

Refined data were then processed in line with the research study objectives with methods such as descriptive statistics providing the basic features of data from the study and simple summaries about sample and measures together with simple graphical analysis forming basis for quantity analysis of data. With descriptive statistics we can simply describe what the data shows.

The outputs of such analysis were then analyzed and interpreted in the context of the study objectives. The analysis was validated /addressed with the field findings and the concern of the stakeholders that have been put forward during focus group discussion etc. Output of the results was validated as far as possible in the context of the limitations of data, the approach and methods applied during the study. Various features such as grouping, pivot tables, cross-tab tables, summarizing etc. were utilized during processing of quantitative data based on the key indicators and sub indicators.

Similarly qualitative processing was also performed on the data and information available through focus group discussion on the various aspects of the study like issue related to policy matters, performance of the road agencies etc.

2.9.3 Preparation of Profile of the Respondents

As a part of the study, the Consultant prepared the profile of the respondents based on various parameters like age group, level of education, ownership of durables, exposure to mass medias (Newspaper, Radio, TV etc.), duration of driving etc. The profiles of the respondents helped to link them with the output of the road users' survey and assess the variability in the responses level and its impacts on the output as such. In meantime, it will also help to benchmark the respondent's profile as well, if similar works are carried out in the future.

2.9.4 Data Analysis and Output Interpretation

The field data were analyzed and output interpreted in line with the study objectives i.e. the satisfaction level of road users in terms of various key indicators and sub-indicators. The data were analyzed and presented using various tools. The output of the analysis was interpreted and findings and recommendations are made accordingly on various aspects of road development, maintenance and future policy issues etc. from road users' perspectives.

2.10 Limitation of Study

As per the scope of the study, it was required to carry out the survey of 1250 Km of selected length of Strategic Road Network, District Roads and Urban Roads. Similarly, it was also required to select at least 50 service centers for interaction with the users' group and the stakeholders. The

actual lengths of the District or Urban Roads are not available in the present Road Statistics. Hence, NRS 2004 has been referred and projected to determine the current lengths for District and Urban roads.

Referring to the availability of authentic data, the traffic count for all the SRN, District and Urban Roads were not available. Thus while determining the sample size for survey, the published Traffic Count Data for 160 Strategic Roads (2011/12) were used as a basis for Strategic Road Network. With these data, the survey sample size was derived for all the service centers along the Strategic Road Network.

Regarding District and Urban Roads, the Consultant reviewed the available documents in which the traffic data as well as the road lengths were not updated. The Consultant therefore considered the district and urban roads for survey as per the ToR and the traffic data estimated based on available traffic data of nearby station on judgmental basis.

The sampling within the Kathmandu Valley was considered in a separate manner, irrespective of the actual traffic counts as the traffic characteristic within Kathmandu Valley was different from the rest of the country. The Consultant selected roads to cover Urban Roads such as inner urban roads with all type of urban traffic modes. Similarly for Strategic Roads, different traffic conditions and modes were also considered.

3. RESPONDENTS' PROFILE

3.1 Introduction

This chapter presents the respondents' demographic profile on the basis of various categories e.g. age group, level of education, ownership of vehicles, exposure to mass media (newspaper, radio, TV and internet etc.), duration of driving, marital status and level of income. The profile of the respondents was required to link it with the output of the road-users survey as well as to act as a level for similar works to be conducted in future. This information were also useful to compare the variability in the response-level and their impact on the output.

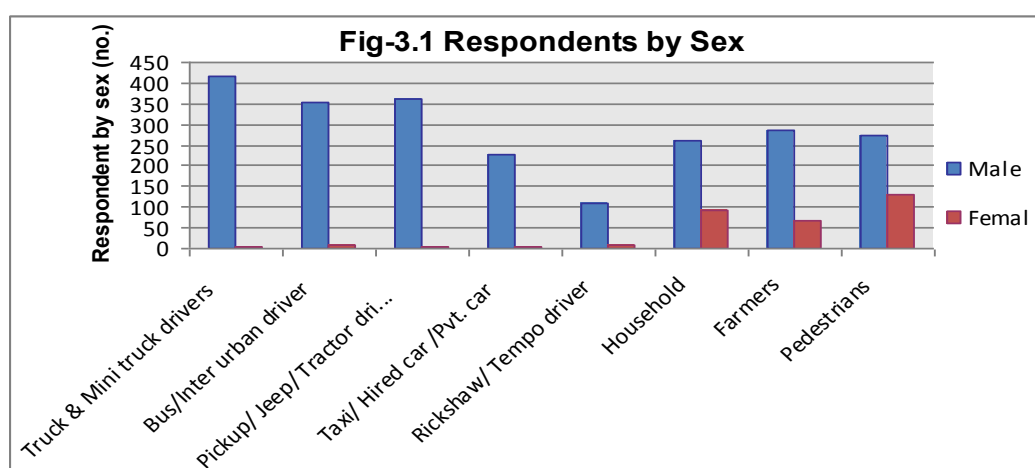
3.2 Demographic Profile of Respondents

Survey team interviewed 2603 respondents such as the drivers of trucks/mini-trucks, buses, inter-urban vehicles, private, hired-cars and three wheelers; road side household, pedestrian and passengers, farmers etc. from 50 Service Centers throughout Nepal in quantitative survey method. The majority of respondents are male covering nearly 88 percent and female covering 12 percent only. Table 3.1 shows the overall demographic distribution of respondents.

Table 3.1 Distribution of Respondents by Sex

Respondents Group	Male			Female			Total	
	No	%	All %	No	%	All %	No	All (%)
Truck & Mini truck drivers	418	99.3	16.1	3	0.7	0.1	421	16.2
Bus/Inter urban driver	354	97.5	13.6	9	2.5	0.3	363	13.9
Pickup/ Jeep/ Tractor drivers	361	98.9	13.9	4	1.1	0.2	365	14.0
Taxi/ Hired car /Pvt. car	229	98.7	8.8	3	1.3	0.1	232	8.9
Rickshaw/ Tempo driver	108	93.1	4.1	8	6.9	0.3	116	4.5
Household	260	73.9	10.0	92	26.1	3.5	352	13.5
Farmers	285	80.7	10.9	68	19.3	2.6	353	13.6
Pedestrians	272	67.8	10.4	129	32.2	5.0	401	15.4
Total	2287	87.9	87.9	316	12.1	12.1	2603	100.0

Source: - Field Visit 2012



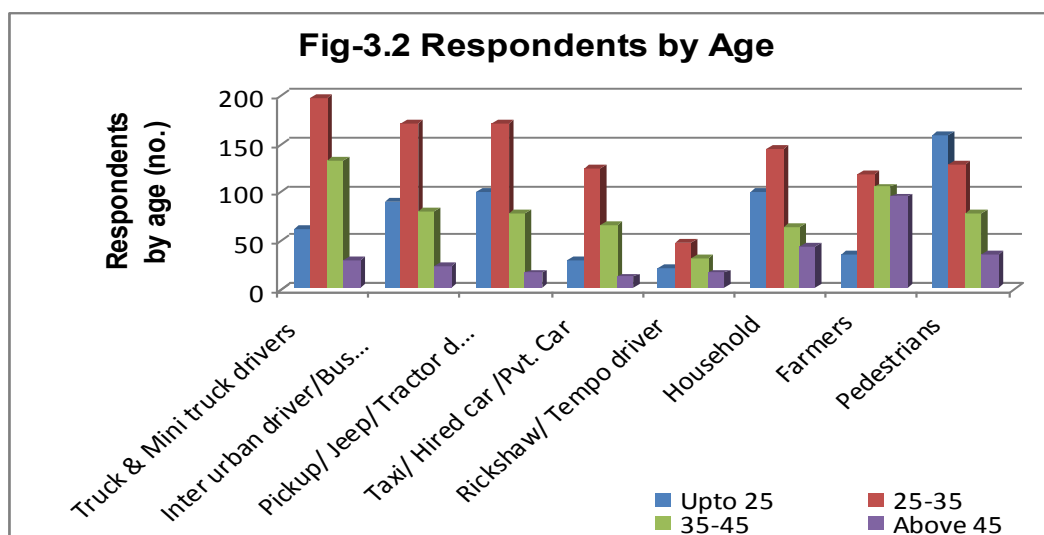
3.3 Age Group Segregation of Respondents

According to the age group distribution, majority of the respondents are in the range of 25-35 years (41%), and those under 25 years 23% and 35-45 years (24% represent nearly equal numbers and those above 45 years represents the lowest numbers, 10 percent only. Table 3.2 shows detailed distribution of respondents by age group:

Table 3.2 Distribution of Respondents by Age

Respondents Group	Upto-25			25-35			35-45			45 above			Total Sample	
	No	%	All %	No	%	All %	No	%	All %	No	%	All %	No	All %
Truck & Mini truck drivers	61	14.5	2.3	198	47.0	7.6	132	31.4	5.1	30	7.1	1.2	421	16.2
Inter urban driver/Bus& Micro	90	24.8	3.5	170	46.8	6.5	80	22.0	3.1	23	6.3	0.9	363	13.9
Pickup/ Jeep/ Tractor drivers	100	27.4	3.8	171	46.8	6.6	78	21.4	3.0	16	4.4	0.6	365	14.0
Taxi/ Hired car /Pvt. Car	29	12.5	1.1	125	53.9	4.8	66	28.4	2.5	12	5.2	0.5	232	8.9
Rickshaw/ Tempo driver	21	18.1	0.8	48	41.4	1.8	31	26.7	1.2	16	13.8	0.6	116	4.5
Household	100	28.4	3.8	145	41.2	5.6	63	17.9	2.4	44	12.5	1.7	352	13.5
Farmers	35	9.9	1.3	118	33.4	4.5	105	29.7	4.0	95	26.9	3.6	353	13.6
Pedestrians	159	39.7	6.1	129	32.2	5.0	77	19.2	3.0	36	9.0	1.4	401	15.4
Total	595	22.9	22.9	1104	42.4	42.4	632	24.3	24.3	272	10.4	10.4	2603	100.0

Source: - Field Visit 2012



3.4 Educational Status of Respondents

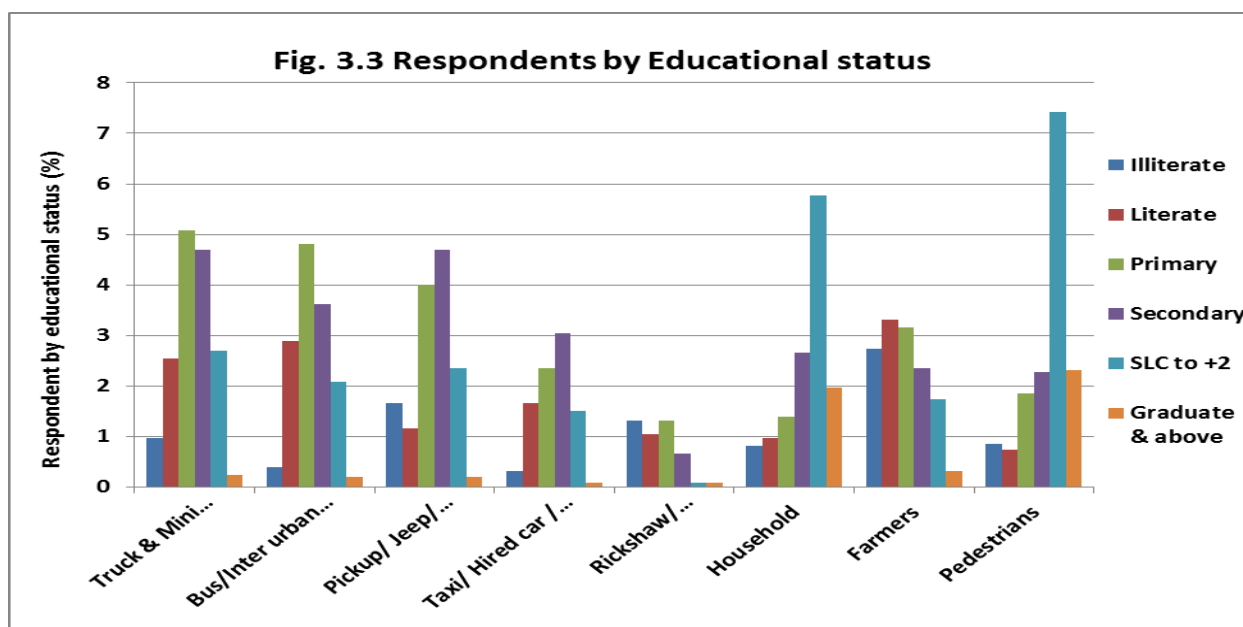
The table 3.3 below shows that 9 percent of the respondents are illiterate, while more than 14 percent respondents literate. Percentage of respondent's in primary and secondary educational level is 24 percent each. Likewise the respondents of SLC and +2 are 23 and those who are Graduate & above are 6 percent only. Amongst all the respondents, pedestrians are more educated than others. The education status of respondents is given in Table 3.3

Table 3.3 Distribution of Respondents by Educational status

(All figures are in percentage)

Respondents Group	Illiterate	Literate	Primary	Secondary	SLC to +2	Graduate & above	Total
Truck & Mini truck drivers	1	2.5	5.1	4.7	2.7	0.2	16.2
Bus/Inter urban driver & Micro	0.4	2.9	4.8	3.6	2.1	0.2	13.9
Pickup/ Jeep/ Tractor drivers	1.7	1.2	4.0	4.7	2.3	0.2	14.0
Taxi/ Hired car / Pvt. Car	0.3	1.7	2.3	3.0	1.5	0.1	8.9
Rickshaw/ Tempo driver	1.3	1.0	1.3	0.7	0.1	0.1	4.5
Household	0.8	1.0	1.4	2.7	5.8	2.0	13.5
Farmers	2.7	3.3	3.2	2.3	1.7	0.3	13.6
Pedestrians	0.8	0.7	1.8	2.3	7.4	2.3	15.4
Total	9.0	14.3	23.9	23.9	23.6	5.3	100.0

Source: - Field Visit 2012



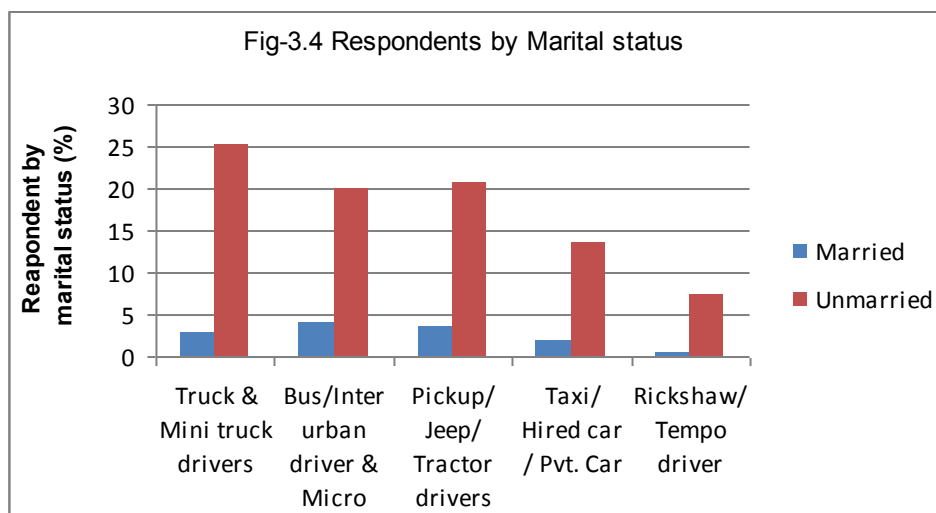
3.5 Marital Status of Respondents

The table 3.4 shows that only 13 percent respondents are married and 87 percent unmarried. Table 3.4 shows the distribution of respondents based on their marital status

Table 3.4 Distribution of Respondents by Marital status

Respondents Group	Married			Unmarried			Total	
	No	%	All %	No	%	All %	No	%
Truck & Mini truck drivers	43	10.2	2.9	378	89.8	25.3	421	28.1
Bus/Inter urban driver & Micro	62	17.1	4.1	301	82.9	20.1	363	24.2
Pickup/ Jeep/ Tractor drivers	54	14.8	3.6	311	85.2	20.8	365	24.4
Taxi/ Hired car / Pvt. Car	29	12.5	1.9	203	87.5	13.6	232	15.5
Rickshaw/ Tempo driver	7	6.0	0.5	109	94.0	7.3	116	7.7
Total	195		13.0	1302		87	1497	100.0

Source: - Field Visit 2012



3.6 Access to Mass Media

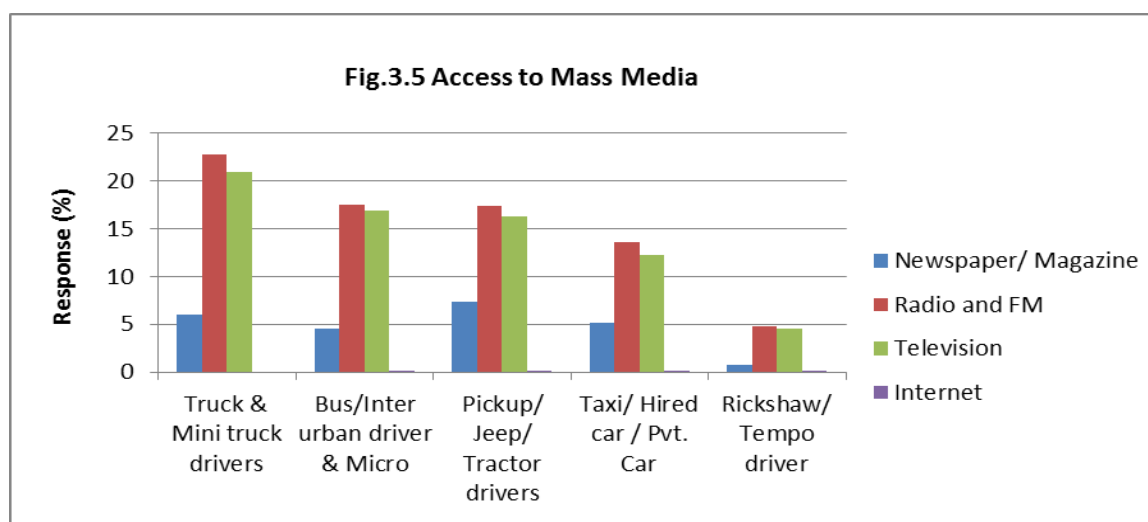
Table 3.5 below shows the extent of exposure that different road-users interviewed in the quantitative surveys have access to newspaper, magazines, radio and television. This information is helpful to identify the most effective media for communication that can be used to reach various road-users.

Among them nearly 24 percent of respondents have access to read news paper. Likewise 76 percent respondents listen to FM radio, 71 percent respondents watch TV and only 0.3 percent use internet.

Table 3.5 Distributions of Respondents with Access to Newspaper/Magazine

Respondents Group	Newspaper /Magazine			Radio and FM			Television			Internet		
	No	%	All %	No	%	All %	No	%	All %	No	%	All %
Truck & Mini truck driver	90	21.4	6.0	341	81.0	22.8	313	74.3	20.9	-	0.0	0.0
Bus/Inter urban driver & Micro	68	18.7	4.5	262	72.2	17.5	253	69.7	16.9	1	0.3	0.1
Pickup/ Jeep/ Tractor driver	111	30.4	7.4	260	71.2	17.4	243	66.6	16.2	2	0.5	0.1
Taxi/ Hired car / Pvt. Car	77	33.2	5.1	203	87.5	13.6	183	78.9	12.2	1	0.4	0.1
Rickshaw/ Tempo driver	12	10.3	0.8	71	61.2	4.7	68	58.6	4.5	1	0.9	0.1
Total	358		23.9	1137		76.0	1060		70.8	5		0.4

Source: - Field Visit 2012



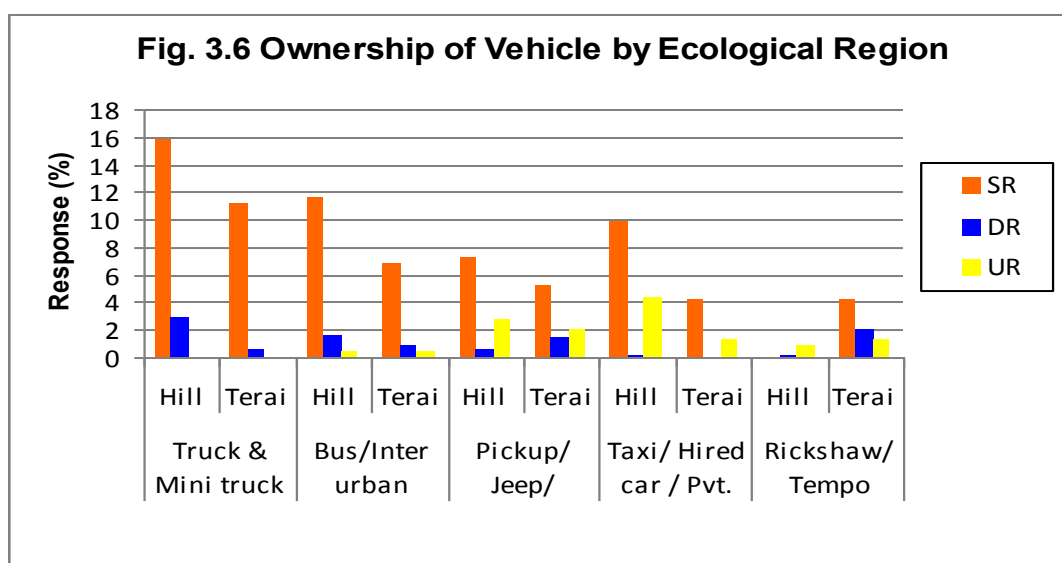
3.7 Vehicles Ownership

Table 3.6 shows pattern of vehicle-ownership by road type and ecological region. On studying the results of vehicle ownerships, it is found that only 548 respondents (out of 2603 sample size) have their own vehicles. Mostly the drivers in hill roads own their vehicles compared to those in Terai roads. The non-motorized vehicle drivers in Terai represent the highest numbers who own their vehicles. There are significantly more drivers of pickups/jeeps/tractors who own vehicles. Similarly, 4.2 percent of taxis/ hired-car drivers and 4.2 percent of NMV-drivers own their vehicles. Comparatively more drivers commuting on strategic roads own their vehicles than District and Urban roads.

Table 3.6 Ownership of Vehicle by Road Type and Ecological Region

Vehicles type	Ecological Region	SR		DR		UR		Total	
		Nos	%	Nos	%	Nos	%	Nos	%
Truck & Mini truck drivers	Hill	87	15.9	16	2.9	0	0.0	103	6.9
	Terai	61	11.1	3	0.5	0	0.0	64	4.3
Bus/Inter urban driver & Micro	Hill	64	11.7	9	1.6	2	0.4	75	5.0
	Terai	37	6.8	5	0.9	2	0.4	44	2.9
Pickup/ Jeep/ Tractor drivers	Hill	40	7.3	3	0.5	15	2.7	58	3.9
	Terai	29	5.3	8	1.5	11	2.0	48	3.2
Taxi/ Hired car / Pvt. Car	Hill	54	9.9	1	0.2	24	4.4	79	5.3
	Terai	23	4.2		0.0	7	1.3	30	2.0
Rickshaw/ Tempo driver	Hill		0.0	1	0.2	5	0.9	6	0.4
	Terai	23	4.2	11	2.0	7	1.3	41	2.7
Total		418	76.3	57	10.4	73	13.3	548	37

Sample size: 1497



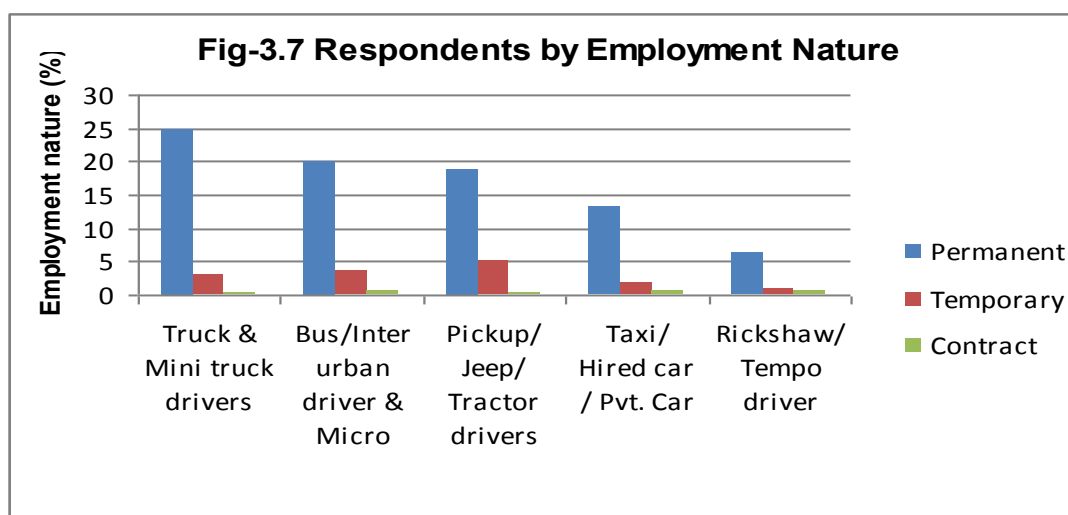
3.8 Employment Status of respondents

Table 3.7 shows the employment status of respondents. Majority of the respondents 83.4 percent are serving on permanent basis while 14.4 percent are serving on temporary basis and 2.2 percent on contract basis.

Table 3.7 Distribution of Respondents by Employment Nature

Respondents Group	Permanent			Temporary			Contract			Total (No)	Overall (%)
	No	%	All	No	%	All	No	%	All		
Truck & Mini truck drivers	374	88.8	25.0	43	10.2	2.9	4	1.0	0.3	421	28.1
Bus/Inter urban driver & Micro	302	83.2	20.2	53	14.6	3.5	8	2.2	0.5	363	24.2
Pickup/ Jeep/ Tractor drivers	282	77.3	18.8	78	21.4	5.2	5	1.4	0.3	365	24.4
Taxi/ Hired car / Pvt. Car	198	85.3	13.2	27	11.6	1.8	7	3.0	0.5	232	15.5
Rickshaw/ Tempo driver	93	80.2	6.2	14	12.1	0.9	9	7.8	0.6	116	7.7
Total	1249		83.4	215		14.4	33		2.2	1497	100

Source: - Field Visit 2012



From fig 3.7 it is clear that most of the drivers are of permanent nature.

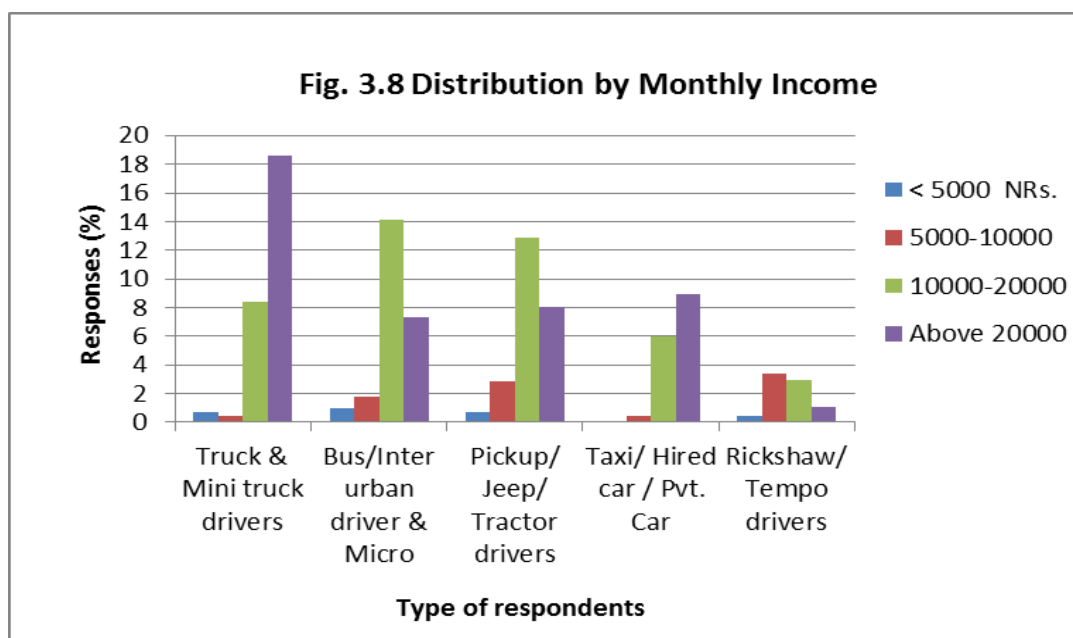
3.9 Income Status Respondents

Table 3.8 gives the average monthly income of respondents. Majority of respondents (44.4 %) earn 10000-20000 per month while 44 percent respondent earn above 20,000. According to the survey 8.8 percent earn 5000-10000 and 2.2 percent less than 5000 per month. The overall income status shows that Truck/Mini truck and Taxi/ Hired car drivers have higher monthly average income than others drivers.

Table 3.8 Distribution of Respondents by Monthly Income

Respondents Group	<5000			5000-10000			10000-20000			Above 20000			Total	Overall (%)
	No	%	All	No	%	All	No	%	All	No	%	All		
Truck & Mini truck drivers	10	2.4	0.7	6	1.4	0.4	125	29.8	8.4	279	66.4	18.6	420	28.1
Bus/Inter urban driver & Micro	14	3.9	0.9	26	7.2	1.7	212	58.6	14.2	110	30.4	7.3	362	24.2
Pickup/ Jeep/ Tractor drivers	11	3.0	0.7	42	11.5	2.8	193	52.7	12.9	120	32.8	8.0	366	24.4
Taxi/ Hired car / Pvt. Car	1	0.4	0.1	7	3.0	0.5	90	38.8	6.0	134	57.8	9.0	232	15.5
Rickshaw/ Tempo drivers	6	5.1	0.4	51	43.6	3.4	44	37.6	2.9	16	13.7	1.1	117	7.8
Total	42	2.8	2.8	132	8.8	8.8	664	44.4	44.4	659	44.0	44.0	1497	100.0

Source: - Field Visit 2012



3.10 Driving Hours

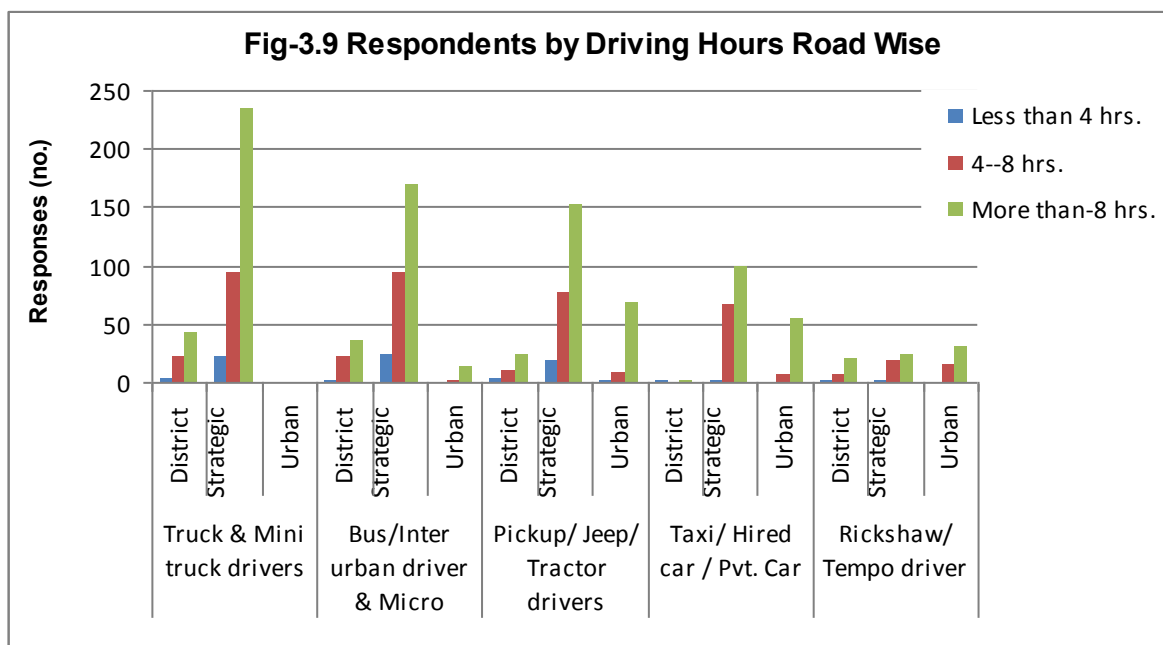
Table 3.9 below shows the daily driving status on different types of road (Strategic, District and Urban) and terrain type by driving hours. The survey data reveals that motorized vehicle drivers on strategic road are driving for significantly a longer period than on other two roads, while on urban roads, Rickshaw and Tempo driver work little longer period.

Table 3.9 Distribution of Respondents by Driving Hours

(All figures are in numbers)

Vehicles type	Road type	Daily Driving Hours			Total	
		< 4 hrs.	4-8 hrs.	> 8 hrs.	No	%
Truck & Mini truck drivers	District	4	22	43	69	4.6
	Strategic	22	95	235	352	23.5
	Urban				0	0.0
Bus/Inter urban driver & Micro	District	1	23	36	60	4.0
	Strategic	24	94	170	288	19.2
	Urban		2	13	15	1.0
Pickup/ Jeep/ Tractor drivers	District	4	10	24	38	2.5
	Strategic	19	77	153	249	16.6
	Urban	1	9	68	78	5.2
Taxi/ Hired car / Pvt. Car	District	2		1	3	0.2
	Strategic	2	66	100	168	11.2
	Urban		7	54	61	4.1
Rickshaw/ Tempo driver	District	1	6	20	27	1.8
	Strategic	1	19	24	44	2.9
	Urban		15	30	45	3.0
Total		81	445	971	1497	

Source: - Field Visit 2012

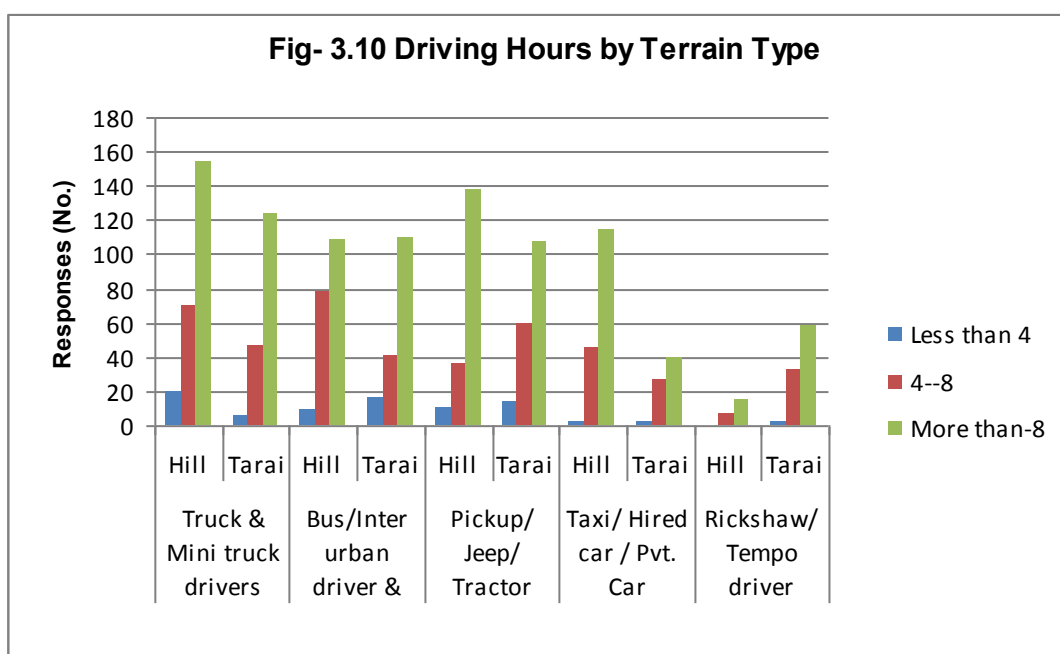


Similarly table 3.10 depicts that the average daily driving hours of motorized vehicles on hill roads is slightly longer than in Terai roads, while for Rickshaw pullers work longer period in Terai roads.

Table 3.10 Distribution of Driving Hours by Terrain Type (All figures are in numbers)

Vehicles type	Ecological Region	Daily Driving Hours			Total	
		<4	4-8	>8	No	%
Truck & Mini truck drivers	Hill	20	70	154	244	16.3
	Terai	6	47	124	177	11.8
Bus/Inter urban driver & Micro	Hill	9	78	109	196	13.1
	Terai	16	41	110	167	11.2
Pickup/ Jeep/ Tractor drivers	Hill	10	36	138	184	12.3
	Terai	14	60	107	181	12.1
Taxi/ Hired car / Pvt. Car	Hill	2	46	115	163	10.9
	Terai	2	27	40	69	4.6
Rickshaw/ Tempo driver	Hill		7	15	22	1.5
	Terai	2	33	59	94	6.3
Total		81	445	971	1497	100

Source: - Field Visit 2012



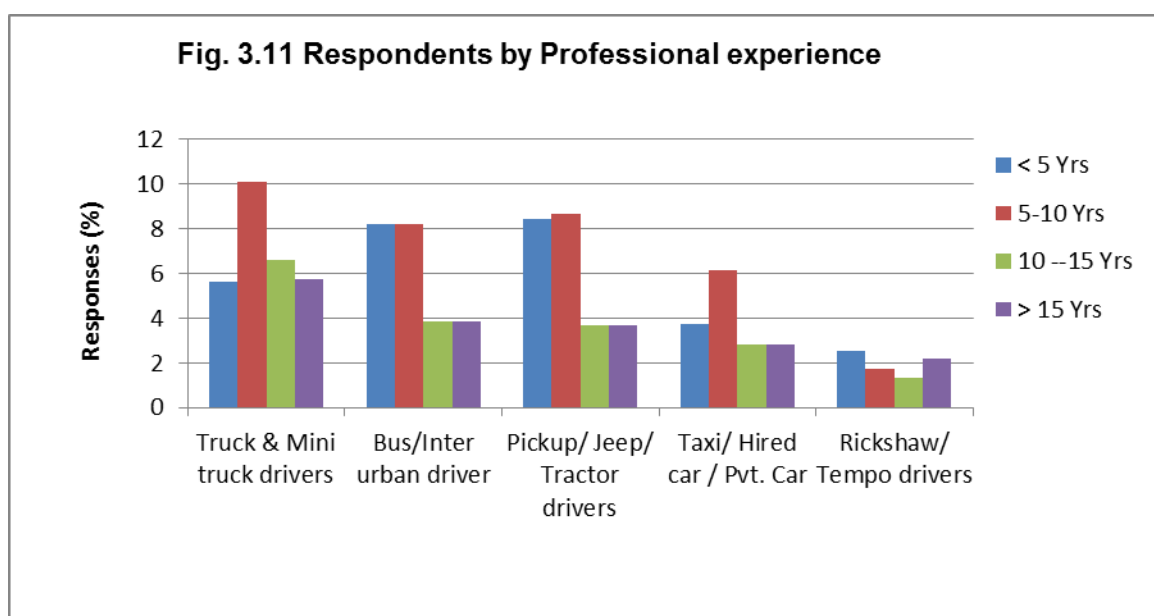
3.11 Status of Respondents by Professional Experience

Table 3.11 below depicts that the majority of the respondents (35 percent) have 5-10 years of driving-experience. The distribution of respondents having driving-experience within the ranges: <5 years, 5-10 years, 10-15 years and above 15 years is 28, 35, 18 and 18 percent respectively. Percentage of drivers with more than 15 years experience was comparatively low.

Table 3.11 Distribution of Respondents by Professional experience

Respondents Group	< 5 Years			5-10 Years			10-15 Years			> 15 Years			Total	Overall (%)
	No	%	All	No	%	All	No	%	All	No	%	All		
Truck & Mini truck drivers	84	20.0	5.6	151	36.0	10.1	99	23.6	6.6	86	20.5	5.7	420	28.1
Bus/Inter urban driver	123	34.0	8.2	123	34.0	8.2	58	16.0	3.9	58	16.0	3.9	362	24.2
Pickup/ Jeep/ Tractor drivers	126	34.4	8.4	130	35.5	8.7	55	15.0	3.7	55	15.0	3.7	366	24.4
Taxi/ Hired car / Pvt. Car	56	24.1	3.7	92	39.7	6.1	42	18.1	2.8	42	18.1	2.8	232	15.5
Rickshaw/ Tempo drivers	38	32.5	2.5	26	22.2	1.7	20	17.1	1.3	33	28.2	2.2	117	7.8
Total	427	28.5	28.5	522	34.9	34.9	274	18.3	18.3	274	18.3	18.3	1497	100.0

Source: - Field Visit 2012



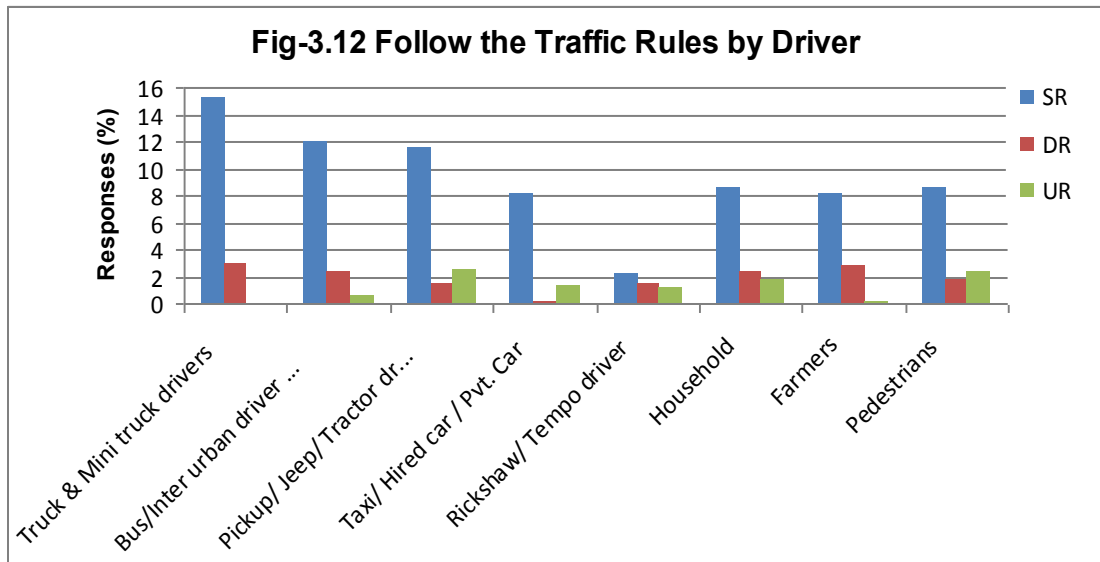
3.12 Adherence to Traffic Rules

Table 3.12 below gives the distribution of respondents who follow the traffic rules and regulation. From fig.3.12 below reveals that nearly 74 percent of the respondents strictly follow the traffic rules and regulations on strategic roads, 16 percent on district roads and only 10 percent on urban roads. In consideration of vehicle type, the most vulnerable traffic rules violators are the Rickshaw and Tempo drivers while the Taxi/ Hired car / Pvt. Car drivers comes under second stand. Comparatively Strategic road driver follow traffic rules and regulations more strictly than District and Urban road drivers.

Table 3.12 Adherence to Traffic Rules by Driver

Respondents Group	SR			DR			UR			Total	overall
	No	%	All	No	%	All	No	%	All		
Truck & Mini truck drivers	337	83.6	15.2	66	16.4	3.0		0.0	0.0	403	18.2
Bus/Inter urban driver & Micro	267	79.7	12.0	54	16.1	2.4	14	4.2	0.6	335	15.1

Pickup/ Jeep/ Tractor drivers	255	73.9	11.5	33	9.6	1.5	57	16.5	2.6	345	15.6
Taxi/ Hired car / Pvt. Car	182	84.3	8.2	4	1.9	0.2	30	13.9	1.4	216	9.7
Rickshaw/ Tempo driver	50	46.3	2.3	32	29.6	1.4	26	24.1	1.2	108	4.9
Household	189	67.5	8.5	51	18.2	2.3	40	14.3	1.8	280	12.6
Farmers	181	73.6	8.2	63	25.6	2.8	2	0.8	0.1	246	11.1
Pedestrians	191	67.3	8.6	41	14.4	1.8	52	18.3	2.3	284	12.8
Total	1652	74.5	74.5	344	15.5	15.5	221	10.0	10.0	2217	100.0



4. ROAD CONDITION AND PERCEIVED IMPACT

4.1 General

This chapter presents the overall condition of the road and its perceived impact on traveling time, vehicle operating and other users' cost and reliability of journey. Responses from all the respondents of total sample size i.e. 2603 on their experiences in the last two years have been collected and presented in this chapter.

4.2 Road Conditions and Travelling Time

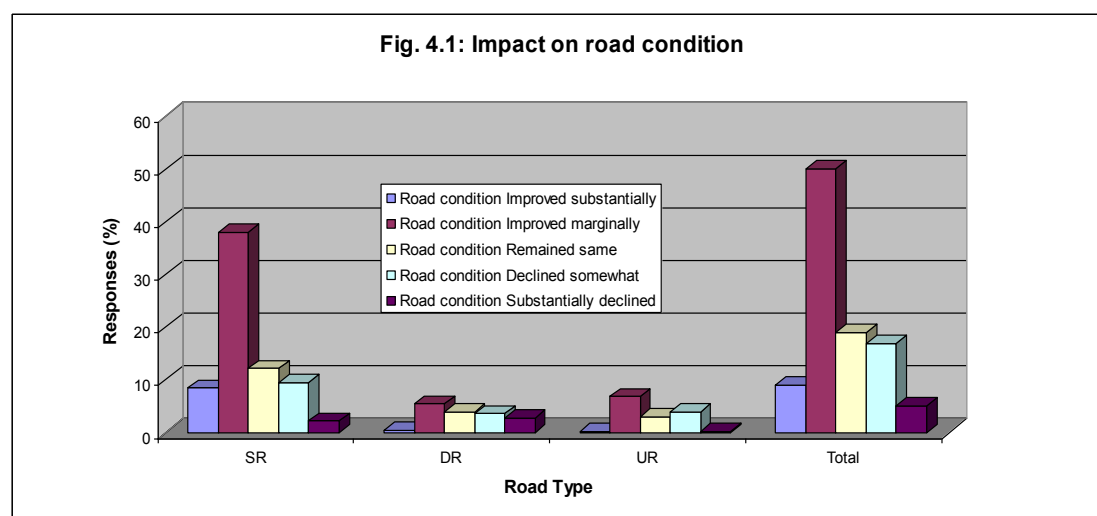
Fig. 4.1 shows the road condition in the last two years have improved marginally in all types of roads with total response of slightly more than 50 percent. Nearly 9 percent have responded substantial improvement and 19 percent responded the road condition remained the same. Similarly, 17 percent of the respondent experienced the road condition has declined somewhat and 5 percent responded a substantial decline.

Table- 4.1: Road Conditions and Traveling Time

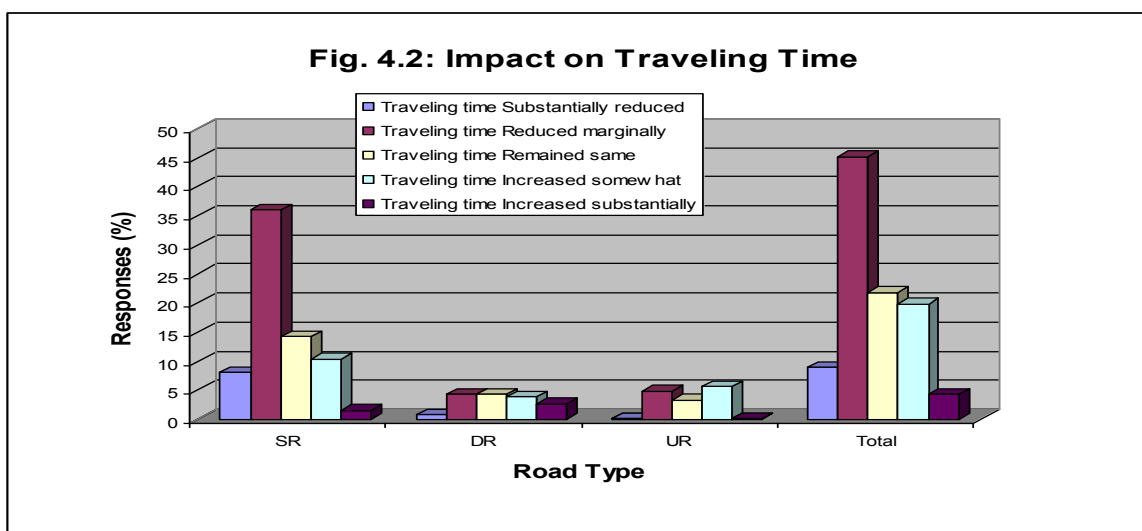
All figures are in percentage)

During last two years.....		SR	DR	UR	Total
Road condition	Improved substantially	8.4	0.5	0.1	9.0
	Improved marginally	38.0	5.4	6.8	50.1
	Remained same	12.1	3.8	3.0	18.9
	Declined somewhat	9.5	3.5	4.0	16.9
	Substantially declined	2.2	2.7	0.2	5.1
Traveling time	Substantially reduced	8.0	0.8	0.2	8.9
	Reduced marginally	36.0	4.3	4.8	45.1
	Remained same	14.2	4.3	3.3	21.8
	Increased somewhat	10.3	3.8	5.6	19.8
	Increased substantially	1.5	2.7	0.2	4.3

Source: - Field visit 2012, Sample size: 2603



The road has direct impact on traveling time, as there is a correlation between road users' perception of improvement in overall condition of the road and reduction in traveling time between any two particular places where they travel frequently. Present study shows that the majority of respondent on SR (36 %), DR (4 %) and UR (5%) have the feeling of marginal reduction of traveling time. However in UR, responses on traveling time 'increased somewhat' is dominant. Overall response on traveling time is presented in fig. 4.2.



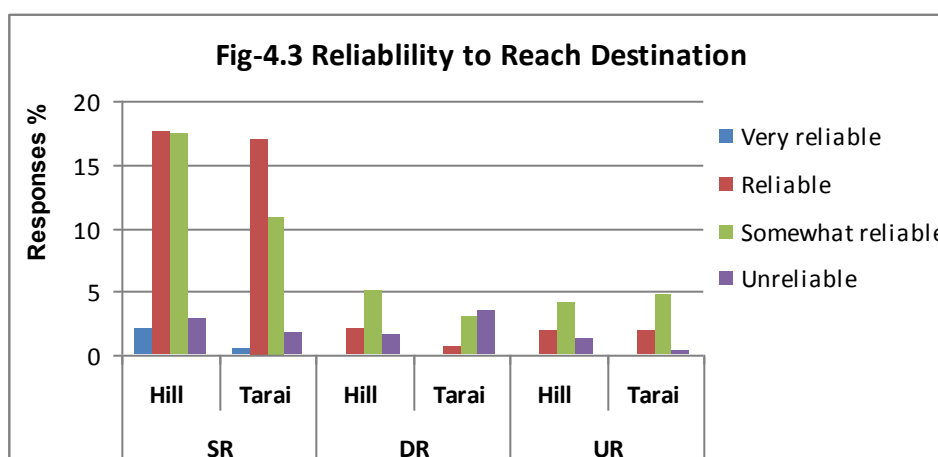
4.3 Reliability to Reach Destination

Survey data on reliability of respondents to reach their destination have been presented in fig. 4.3, which shows on SR Hill roads, majority of responses are on 'somewhat reliable' to 'reliable' (17 %) and in Terai roads, 17 % are 'reliable'. However in DR and UR, 'somewhat reliable' is more dominant. Overall data shows that 'somewhat reliable' is the most dominating followed by 'reliable'.

Table 4.2 Reliability to reach destination

(All figures are in percentage)

Reliable to reach	SR		DR		UR		Total
	Hill	Terai	Hill	Terai	Hill	Terai	
Very reliable	2.1	0.5	0.0	0.0	0.0	0.0	2.7
Reliable	17.7	16.9	2.1	0.6	1.9	1.9	41.1
Somewhat reliable	17.4	10.8	5.0	3.0	4.0	4.6	44.9
Unreliable	2.8	1.7	1.6	3.5	1.3	0.3	11.3
Total	40.1	30.0	8.8	7.1	7.2	6.9	100



4.4 Effect on operating cost of vehicles

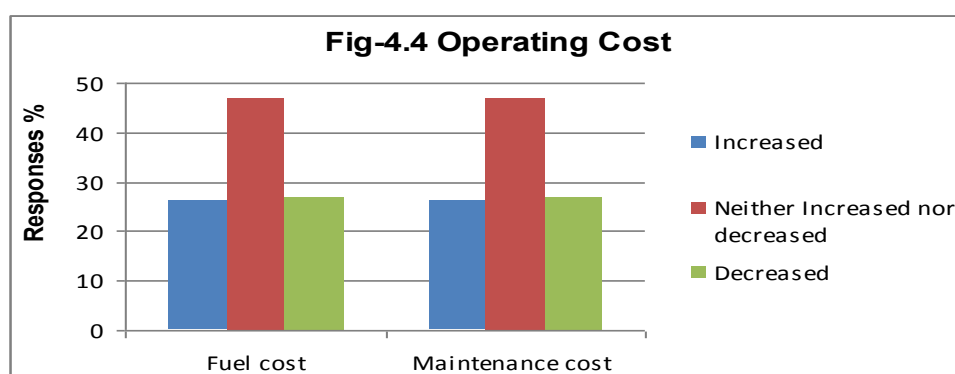
The road conditions have direct impact on operating cost (maintenance cost and fuel consumption) of vehicles. Fig.4.4 shows the responses on vehicle operation and maintenance costs for different types of roads in hill and Terai roads. From the responses, it is found that almost all the costs in

hills roads are higher than in Terai. It is also observed that cost of fuel comprises the highest portion of the vehicle operation costs for all vehicle class. Some drivers/ owners of motorized vehicles feel that the fuel consumption and maintenance cost of their vehicles has increased over the years. It is significantly high at strategic roads, where 47 percent of the respondents feel neither increased nor decreased and 26 percent feel decreased. On the other hand, the response on increase and decrease in costs is more or less the same i. e. around 26 to 27 percent.

Table 4.3 Operating cost of vehicles

(All figures are in percentage)

Operating cost in Percentage		SR	DR	UR	Total
Fuel consumption and operating cost	Increased	13.3	7.6	5.2	26.1
	Neither Increased nor decreased	36.3	4.5	6.1	47.0
	Decreased	23.9	1.0	2.0	26.9
Maintenance cost	Increased	13.6	7.7	5.1	26.3
	Neither Increased nor decreased	36.5	4.5	5.9	47.0
	Decreased	23.4	1.0	2.3	26.7



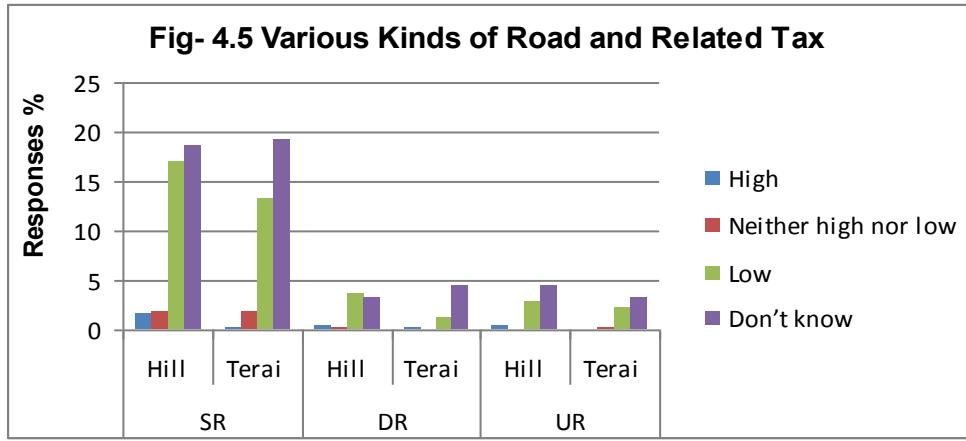
4.5 Road Taxes

Majority of the vehicle drivers/ owners (40%) feel that various kinds of road taxes and road related other taxes, which are collected in various modes and at different period of time are low, whereas 3 percent feel it high, nearly 5 percent feel neither high nor low. A major portion (about 53 percent) of the respondents is unaware of road and other road related taxes. Following figure 4.5 shows the responses on road and other related taxes:

Table 4.4 Road and Related Taxes

(All figures are in percentage)

Various kinds of road and related taxes are.....	SR		DR		UR		Total (%)
	Hill	Terai	Hill	Terai	Hill	Terai	
High	1.6	0.2	0.3	0.2	0.3	0.0	2.7
Neither high nor low	1.7	1.8	0.3	0.1	0.0	0.3	4.1
Low	17.0	13.3	3.5	1.1	2.9	2.2	40.1
Don't know	18.6	19.2	3.2	4.4	4.5	3.1	53.1
Total	39.0	34.5	7.3	5.8	7.7	5.6	100.0



5. COMFORT AND CONVENIENCE

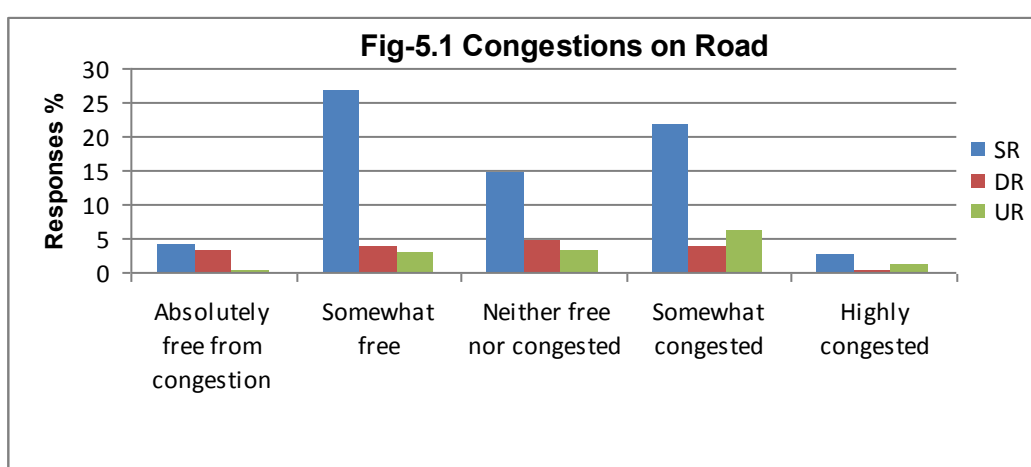
This chapter deals with the responses from road-users regarding their assessment of existing roads of Nepal in terms of their perceptions on comfort and convenience which is governed by various sub-indicators such as quality of road, traffic congestion, accessibility to the intended destination, delays in traveling time, information on road works and road signs etc.

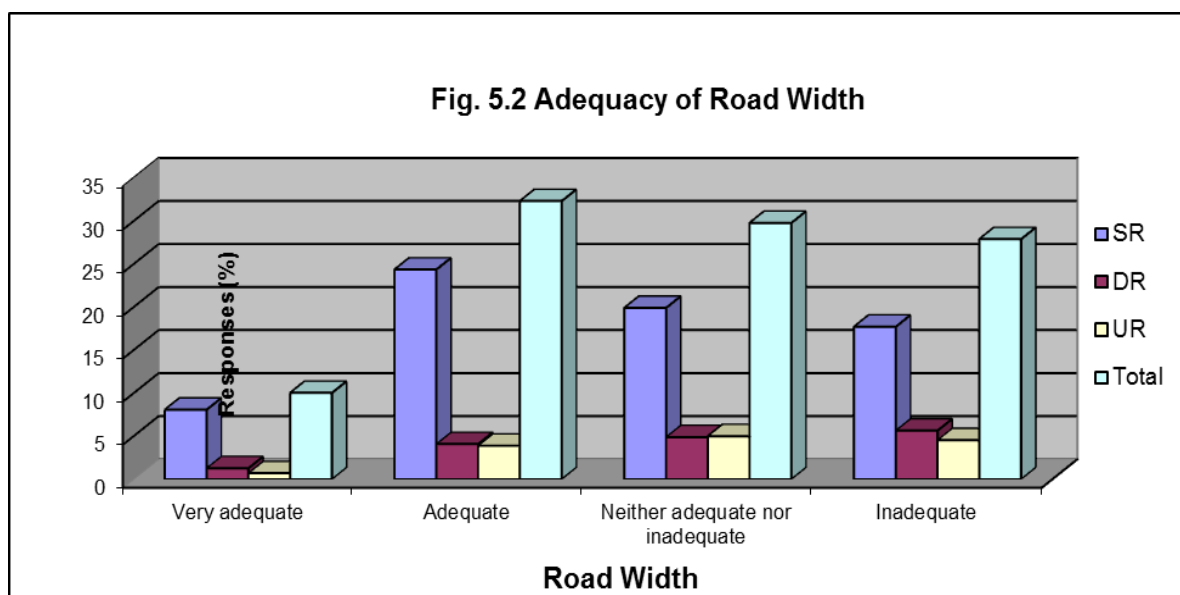
5.1 Congestion on Roads

Survey data on congestion aspect shows that only 7.5 percent of the road-users feel roads absolutely free from congestion while 33.7 percent feel somewhat free, 22.7 percent feel neither free nor congested and 4.1 percent highly congested. Normally the traffic congestion in strategic road is higher than in district and urban roads. Table-5.1 below summarizes the overall status of road congestion and adequacy of road width:

Table 5.1 Congestions on Road and Adequacy of Road-width

Attributes.....	Satisfaction level	SR		DR		UR		Total	
		No	%	No	%	No	%	No	%
Congestions	Absolutely free from congestion	107	4.1	81	3.1	7	0.3	195	7.5
	Somewhat free	699	26.9	99	3.8	78	3.0	876	33.7
	Neither free nor congested	383	14.7	121	4.6	88	3.4	592	22.7
	Somewhat congested	565	21.7	103	4.0	164	6.3	832	32.0
	Highly congested	69	2.7	9	0.3	30	1.2	108	4.1
Road Width	Very adequate	210	8.1	33	1.3	18	0.7	261	10.0
	Adequate	634	24.4	106	4.1	101	3.9	841	32.3
	Neither adequate nor inadequate	518	19.9	127	4.9	130	5.0	775	29.8
	Inadequate	461	17.7	147	5.6	118	4.5	726	27.9





5.2 Information on road works

This study presents the overall status of responses on information of road works in progress. Table 5.2 & 5.3 illustrates the road-users' assessment of various aspects related to existing condition of the roads and its work progress (e.g. information on road work and work in progress). The assessment is given according to the road-class (i.e. strategic, district and urban roads).

Table 5.2 Information on Road Works

Respondents Group	SR		DR		UR		Total	
	No	%	No	%	No	%	No	%
Truck & Mini truck drivers	268	15.1	40	2.2		0.0	308	17.3
Bus/Inter urban driver & Micro	224	12.6	25	1.4	11	0.6	260	14.6
Pickup/ Jeep/ Tractor drivers	198	11.1	18	1.0	33	1.9	249	14.0
Taxi/ Haired car	134	7.5	2	0.1	39	2.2	175	9.8
Rickshaw/ / Tempo driver	40	2.2	10	0.6	15	0.8	65	3.7
Household	168	9.4	12	0.7	40	2.2	220	12.4
Farmers	180	10.1	37	2.1		0.0	217	12.2
Pedestrians	212	11.9	30	1.7	42	2.4	284	16.0
Total	1424	80.1	174	9.8	180	10.1	1778	100.0

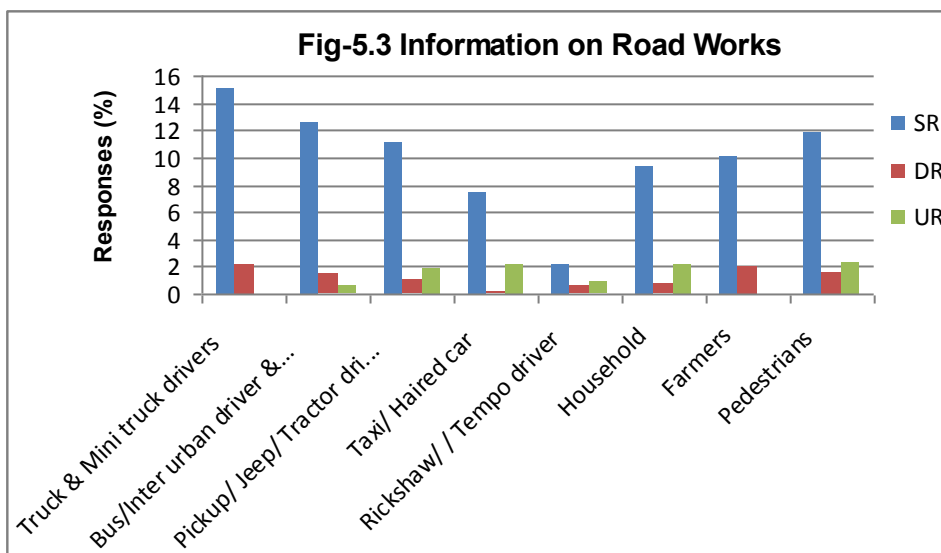
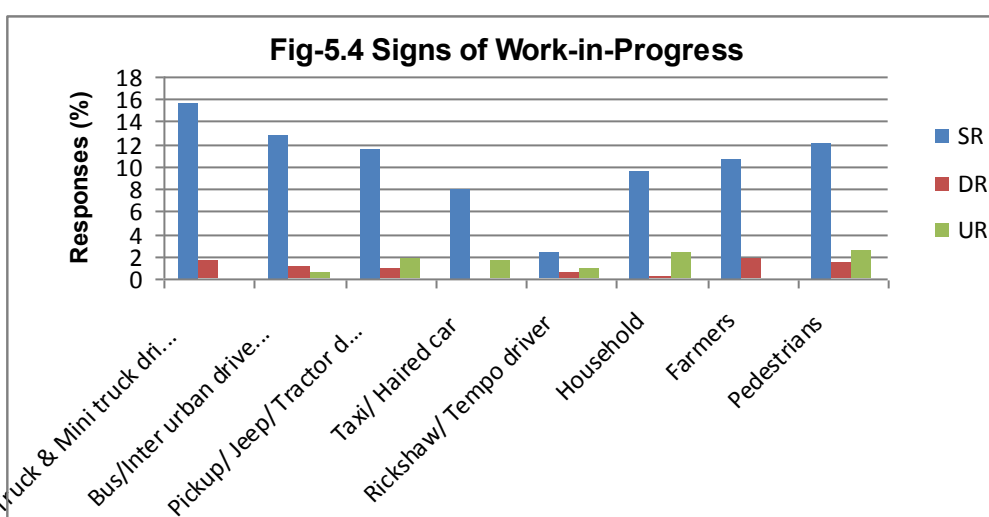


Table 5.3 Sign of Work-in-Progress

Respondents Group	SR		DR		UR		Total	
	No	%	No	%	No	%	No	%
Truck & Mini truck drivers	253	15.7	27	1.7		0.0	280	17.4
Bus/Inter urban driver & Micro	208	12.9	16	1.0	9	0.6	233	14.5
Pickup/ Jeep/ Tractor drivers	186	11.5	13	0.8	29	1.8	228	14.1
Taxi/ Haired car	130	8.1	1	0.1	27	1.7	158	9.8
Rickshaw/ Tempo driver	37	2.3	10	0.6	13	0.8	60	3.7
Household	156	9.7	4	0.2	37	2.3	197	12.2
Farmers	171	10.6	28	1.7		0.0	199	12.3
Pedestrians	194	12.0	24	1.5	39	2.4	257	15.9
Total	1335	82.8	123	7.6	154	9.6	1612	100.0



5.3 Quality of Road

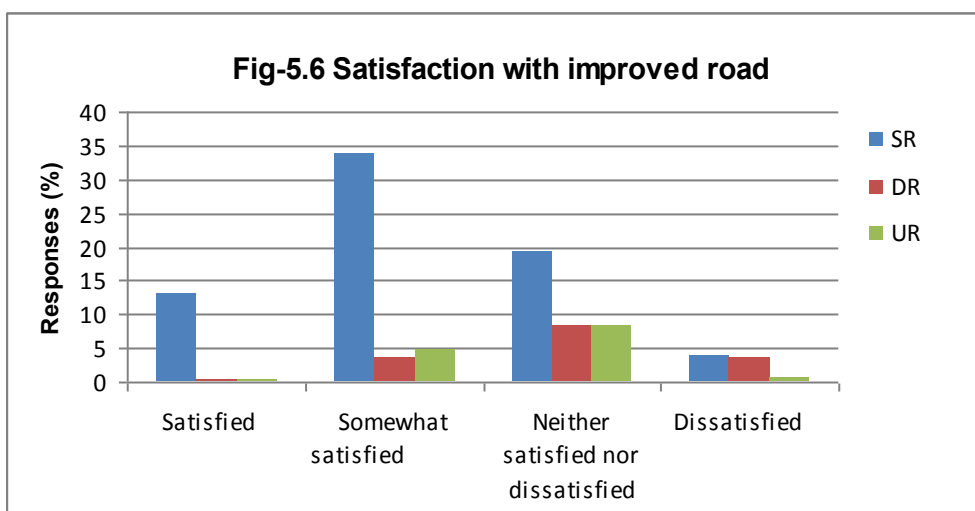
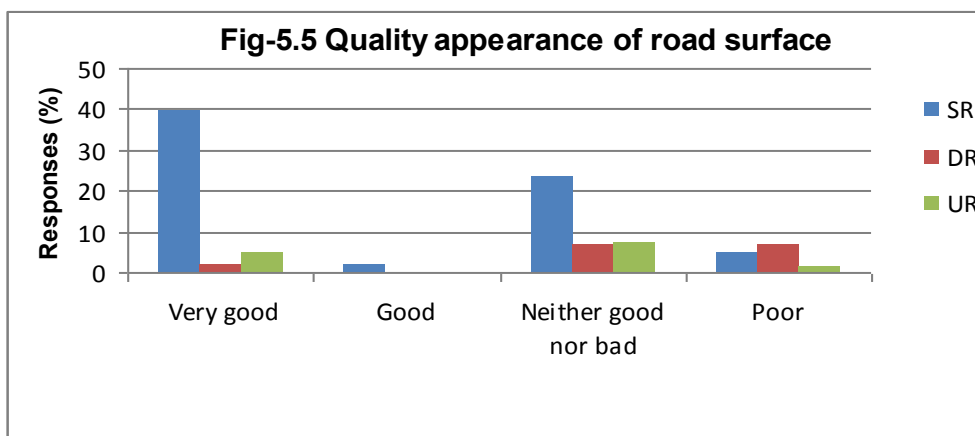
Majority of the respondents (46.2%) are satisfied with present road quality, road-surface, smoothness and appearance, whereas 13.6 percent said it poor. Similarly 2.3 percent respondent

said good and 38.2 percent said neither good nor bad. Comparatively strategic road quality is better than others roads.

However, satisfaction with overall condition and maintenance of road in different road is higher, which is quite good in comparison to their satisfaction levels with road maintenance. Table 5.4 shows the quality of road and respondent satisfaction level with deferent categories of roads.

Table 5.4 Quality of Road surface

Attribute	Satisfaction level	SR		DR		UR		Total	
		No	%	No	%	No	%	No	%
Quality appearance of road surface.....	Very good	1028	39.5	50	1.9	124	4.8	1202	46.2
	Good	51	2.0	4	0.2	6	0.2	61	2.3
	Neither good nor bad	615	23.6	184	7.1	196	7.5	995	38.2
	Poor	129	5.0	175	6.7	41	1.6	345	13.3
Satisfaction with improved road....	Satisfied	338	13.0	8	0.3	7	0.3	353	13.6
	Somewhat satisfied	881	33.8	95	3.6	123	4.7	1099	42.2
	Neither satisfied nor dissatisfied	500	19.2	217	8.3	218	8.4	935	35.9
	Dissatisfied	104	4.0	93	3.6	19	0.7	216	8.3



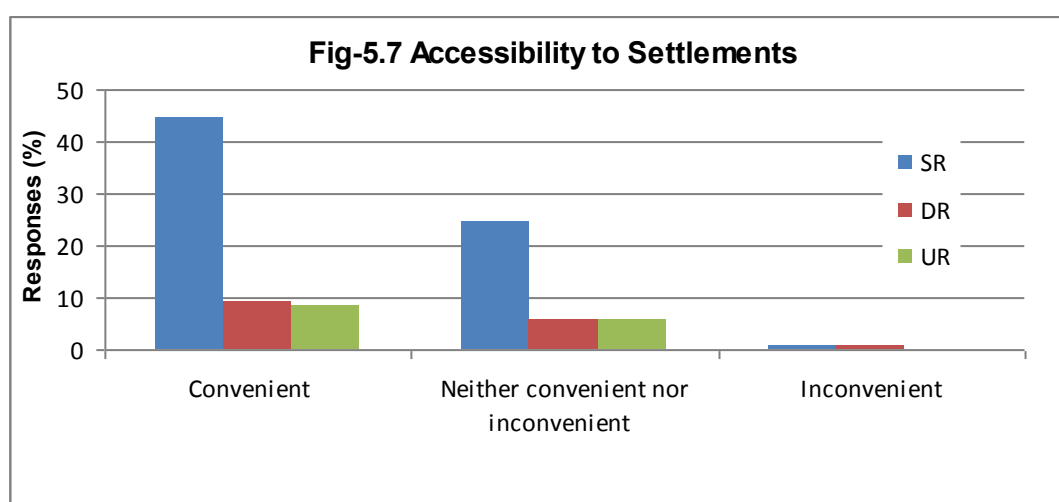
5.4 Accessibility to Settlements

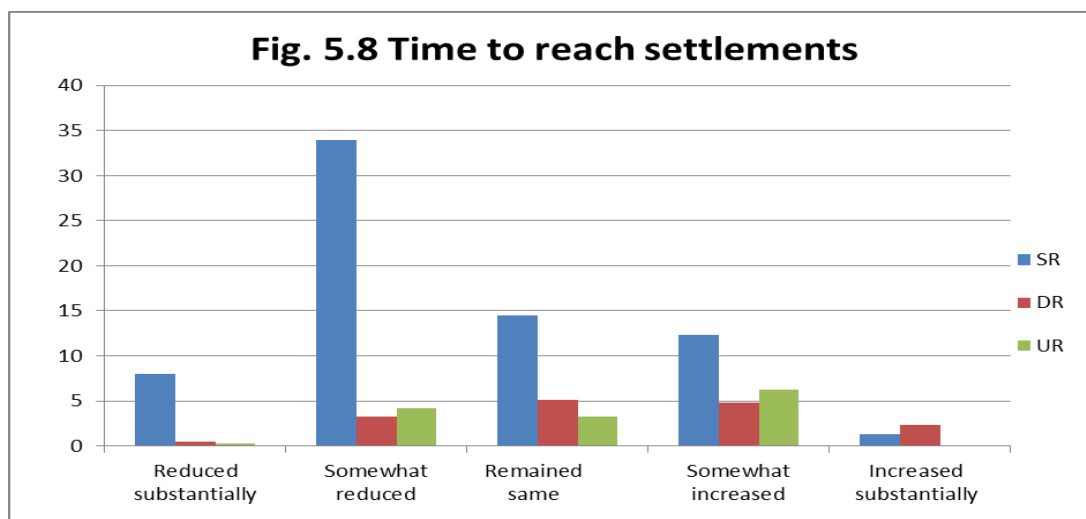
Table 5.5 below depicts 62 percent of respondents feel that the accessibility to reach settlements where they need to visit very regularly like workplaces, residence, shops, schools, hospitals, is more convenient in the last two years. Among them 36 percent feel neither convenient nor inconvenient and only 2 percent said it inconvenient. Road accessibility in strategic roads is more convenient than district and urban roads.

However in response to traveling time, nearly 9 percent respondents feel the time taken to reach settlements has substantially reduced due to the presence of roads. Frequently the road users in hilly terrain have to travel through alternative routes due to poor road quality, which eventually take more time. Table 5.4 below summarizes the detailed status of accessibility to settlement and time change in travelling.

Table 5.5 Accessibility to Settlements and Time Consumption

Accessibility to Settlements.....		SR		DR		UR		Total	
		No	%	No	%	No	%	No	%
Accessibility to Settlements.....	Convenient	1163	44.7	238	9.1	216	8.3	1617	62.1
	Neither convenient nor inconvenient	638	24.5	153	5.9	149	5.7	940	36.1
	Inconvenient	22	0.8	22	0.8	2	0.1	46	1.8
Time taken to reach settlement....	Reduce substantially	208	8.0	13	0.5	8	0.3	229	8.8
	Somewhat reduce	883	33.9	84	3.2	109	4.2	1076	41.3
	Remained some	378	14.5	132	5.1	86	3.3	596	22.9
	Somewhat increased	321	12.3	124	4.8	162	6.2	607	23.3
	Increased substantial	33	1.3	60	2.3	2	0.1	95	3.6



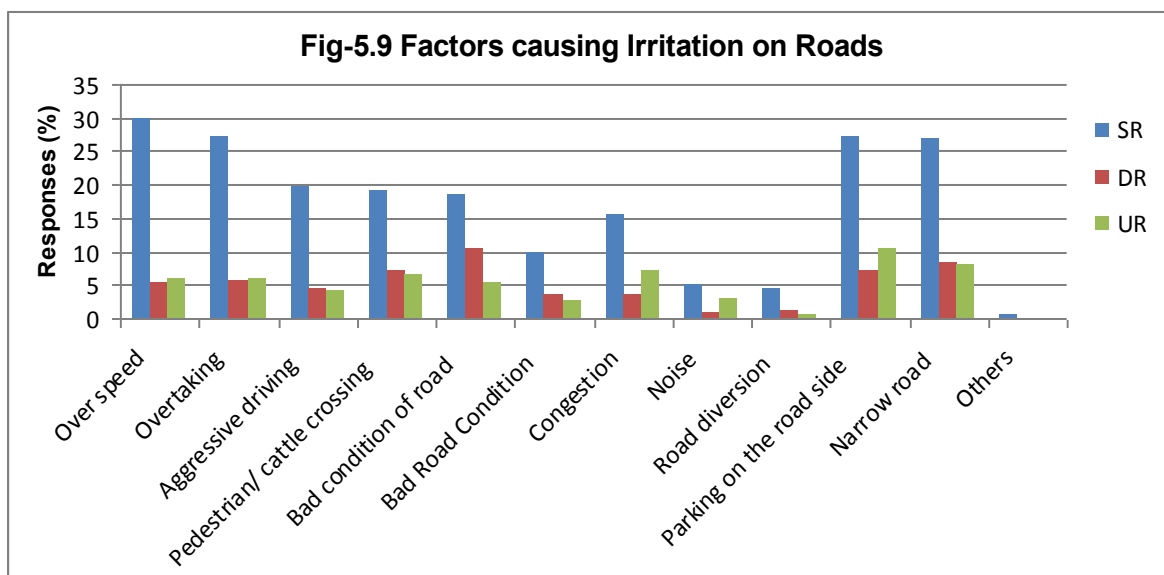


5.5 Irritating factor

Table 5.6 briefly describes the road users' perception towards irritating factor while traveling or driving through roads in Nepal. Generally poor road condition, potholes, over speed, unnecessary over taking, aggressive driving, reckless road crossing by pedestrian/cattle and congestion etc. were the main causes of irritating factors in all types of roads. Majority of respondent said that road side parking (44.8%), over speed (44.1%) and narrow road (43.3%) are major causes of irritation, especially in strategic roads. Table 5.6 below summarizes the detailed status of factors causing irritation on road.

Table 5.6 Factor causing Irritation on Roads

Reason of irritation.....	SR		DR		UR		Total	
	No	%	No	%	No	%	No	%
Over speed	778	29.9	144	5.5	156	6.0	1078	41.4
Overtaking	708	27.2	147	5.6	156	6.0	1011	38.8
Aggressive driving	514	19.7	116	4.5	106	4.1	736	28.3
Pedestrian/ cattle crossing	499	19.2	188	7.2	171	6.6	858	33.0
Bad condition of road	480	18.4	270	10.4	138	5.3	888	34.1
Bad Road Condition	254	9.8	95	3.6	68	2.6	417	16.0
Congestion	406	15.6	93	3.6	187	7.2	686	26.4
Noise	131	5.0	24	0.9	78	3.0	233	9.0
Road diversion	118	4.5	28	1.1	19	0.7	165	6.3
Parking on the road side	709	27.2	186	7.1	271	10.4	1166	44.8
Narrow road	704	27.0	216	8.3	208	8.0	1128	43.3
Others	19	0.7	2	0.1	2	0.1	23	0.9



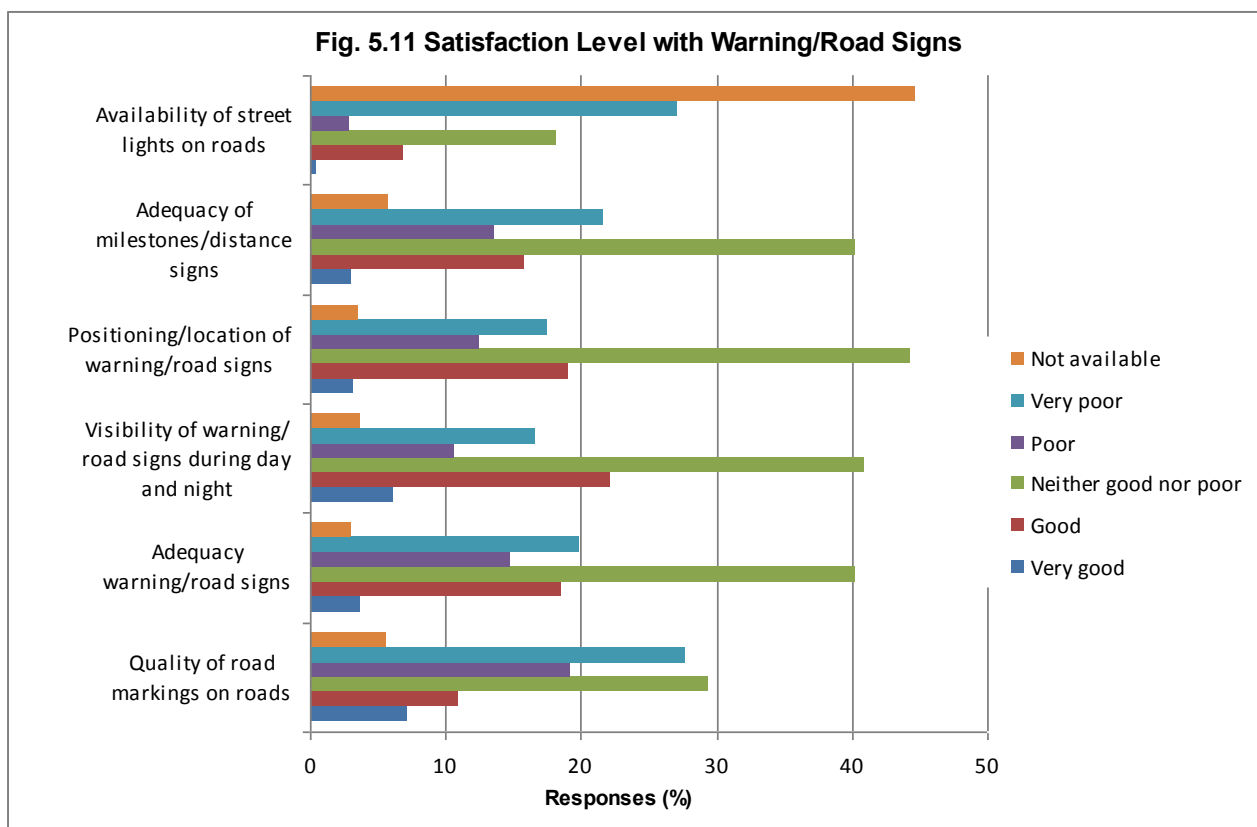
5.6 Road Marking

Table 5.7 shows the respondent satisfaction level on road marking and distance signs. Majority of the road users are dissatisfied with the distance signs on different roads. In their opinion road making, distance signs/milestones should be adequate and clearly visible at all times. Table 5.7 below summarizes the respondents' satisfaction level in road marking and distance signs on all categories of roads i. e. strategic, district and urban roads.

Table 5.7 Road marking and distance signs

Satisfaction level		SR		DR		UR		Total	
		No	%	No	%	No	%	No	%
Quality of road markings on this road	Very good	99	6.7	5	0.3	1	0.1	105	7.1
	Good	149	10.1	7	0.5	5	0.3	161	10.9
	Neither good nor poor	330	22.4	33	2.2	71	4.8	434	29.5
	Poor	204	13.8	61	4.1	18	1.2	283	19.2
	Very poor	261	17.7	55	3.7	92	6.2	408	27.7
	Not available	44	3.0	35	2.4	3	0.2	82	5.6
Adequacy warning/road sign	Very good	47	3.2	4	0.3	3	0.2	54	3.7
	Good	261	17.7	6	0.4	6	0.4	273	18.5
	Neither good nor poor	440	29.9	76	5.2	77	5.2	593	40.3
	Poor	164	11.1	35	2.4	19	1.3	218	14.8
	Very poor	152	10.3	57	3.9	83	5.6	292	19.8
	Not available	23	1.6	18	1.2	2	0.1	43	2.9
Visibility of warning/ roads signs during day and night	Very good	80	5.5	7	0.5	2	0.1	89	6.1
	Good	316	21.7	3	0.2	3	0.2	322	22.2
	Neither good nor poor	433	29.8	75	5.2	87	6.0	595	40.9
	Poor	93	6.4	32	2.2	29	2.0	154	10.6
	Very poor	124	8.5	51	3.5	66	4.5	241	16.6
	Not available	28	1.9	21	1.4	3	0.2	52	3.6
Positioning/location of warning/road	Very good	43	2.9	2	0.1		0.0	45	3.1
	Good	273	18.5	1	0.1	7	0.5	281	19.1

Satisfaction level		SR		DR		UR		Total	
		No	%	No	%	No	%	No	%
signs	Neither good nor poor	489	33.2	80	5.4	84	5.7	653	44.3
	Poor	110	7.5	36	2.4	38	2.6	184	12.5
	Very poor	145	9.8	55	3.7	58	3.9	258	17.5
	Not available	27	1.8	22	1.5	3	0.2	52	3.5
Adequacy of milestones/distance signs	Very good	43	2.9		0.0		0.0	43	2.9
	Good	221	15.0	7	0.5	4	0.3	232	15.8
	Neither good nor poor	448	30.5	69	4.7	76	5.2	593	40.3
	Poor	141	9.6	38	2.6	21	1.4	200	13.6
	Very poor	183	12.4	53	3.6	83	5.6	319	21.7
	Not available	50	3.4	29	2.0	5	0.3	84	5.7
Availability of streetlights on this road	Very good	6	0.4		0.0		0.0	6	0.4
	Good	93	6.4	2	0.1	4	0.3	99	6.9
	Neither good nor poor	171	11.9	22	1.5	69	4.8	262	18.2
	Poor	28	1.9	2	0.1	11	0.8	41	2.8
	Very poor	246	17.1	50	3.5	94	6.5	390	27.0
	Not available	520	36.1	113	7.8	11	0.8	644	44.7



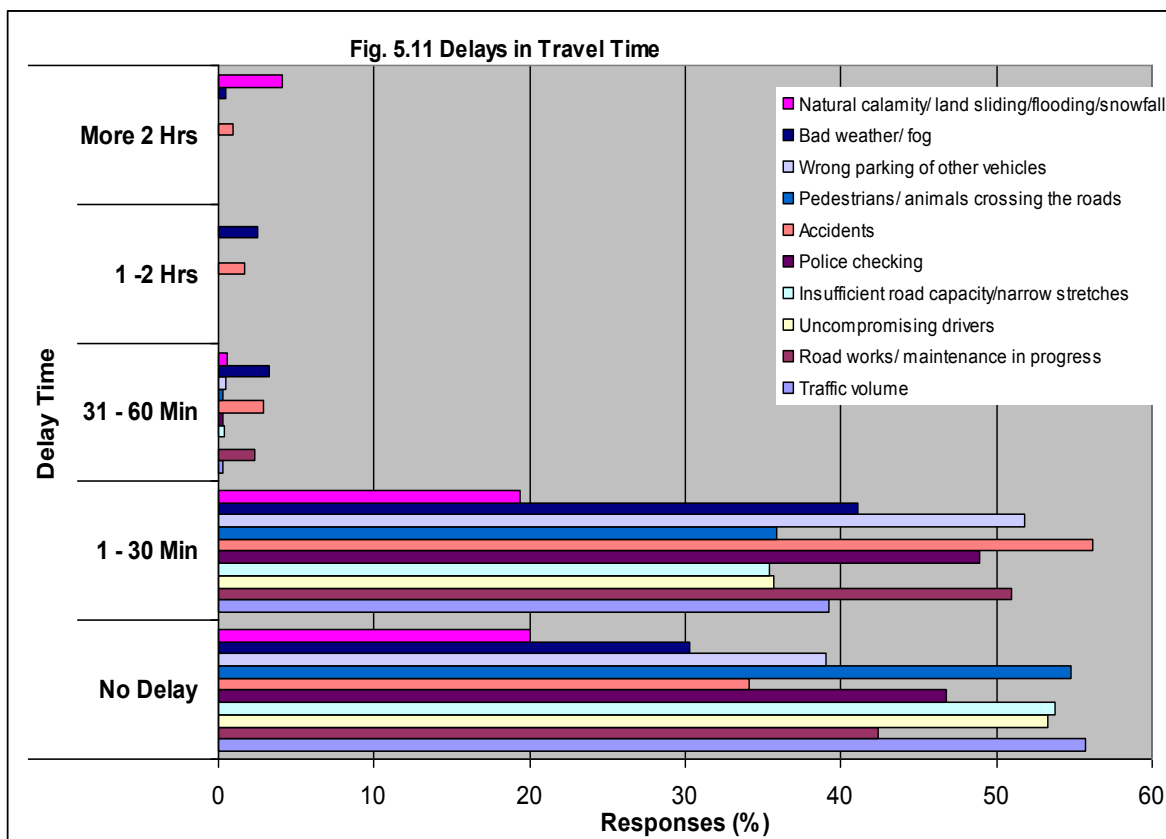
5.7 Causes and extent of delay

Overall study shows a number of factors that make delay during travel. Table 5.8 shows respondents' perception on various factors those make them delays during their travel.

Table 5.8 Causes and extent of delay

(All figures are in percentage)

Reason	Delay Time					Total Respondent
	No Delay	1 - 30 Min	31 - 60 Min	1 - 2 Hrs	More than 2 Hrs	
Traffic volume	55.7	39.2	0.3	0.0	0.0	95.2
Road works/ maintenance in progress	42.4	51.0	2.3	0.1	0.0	95.9
Uncompromising drivers	53.3	35.7	0.1	0.0	0.0	89.2
Insufficient road capacity/narrow stretches	53.8	35.4	0.4	0.0	0.0	89.6
Police checking	46.8	48.9	0.3	0.0	0.0	95.9
Accidents	34.1	56.2	2.9	1.7	0.9	95.9
Pedestrians/ animals crossing the roads	54.8	35.9	0.3	0.1	0.0	91.1
Wrong parking of other vehicles	39.0	51.8	0.5	0.1	0.1	91.5
Bad weather/ fog	30.3	41.1	3.3	2.5	0.5	77.8
Natural calamity/ land sliding/flooding/snowfall	20.0	19.4	0.6	0.1	4.1	44.2



6. SAFETY ASPECTS

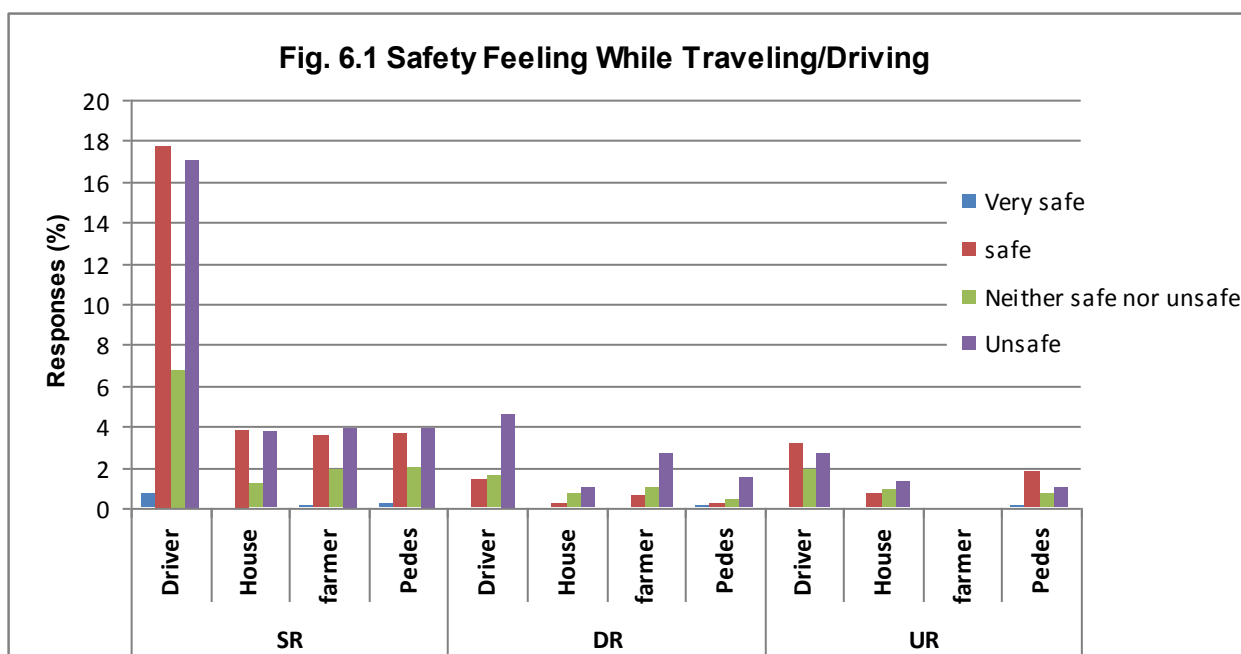
6.1 Perceptions about safety

Road safety is major concern while traveling from one place to another. In context of Nepal it has been given low priority. During survey, only 1.1 percent of the respondents feel very safe while traveling on roads. Comparatively hill roads are more unsafe than Terai roads mainly due to fragile geomorphological condition as well as poor road management (narrow road, sharp bends, poor road signs, negligence of regular maintenance etc).

Table 6.1 Respondents' perception about road safety

(All figures are in percentage)

Feeling safe While traveling/driving	SR				DR				UR		
	Driver	House	farmer	Pedes.	Driver	House	farmer	Pedes.	Driver	House	farmer
Very safe	0.7	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0
safe	17.7	3.8	3.5	3.6	1.3	0.2	0.6	0.2	3.1	0.7	0.0
Neither safe nor unsafe	6.8	1.2	1.8	2.0	1.6	0.7	1.0	0.4	1.9	0.9	0.0
Unsafe	17.1	3.7	3.9	3.9	4.6	1.0	2.6	1.5	2.6	1.3	0.0



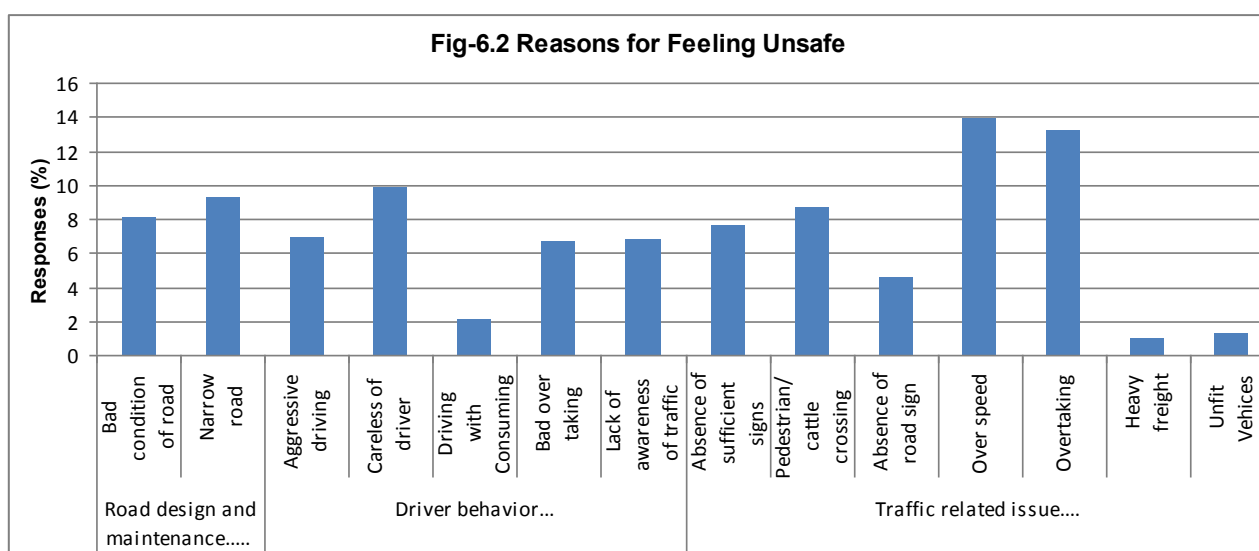
6.2 Reasons for feeling unsafe

Bad road condition is the most important concern of the respondents for feeling unsafe. Road agencies need to look at this aspect very closely to change unsafe feelings of road users. Table 6.2 shows the distribution of the responses from the road users regarding their perception on various reasons for feeling unsafe.

Table 6.2 Reasons for feeling Unsafe

(All figures are in percentage)

Feeling unsafe.....		SR		DR		UR		Total	
		Hill	Terai	Hill	Terai	Hill	Terai	No.	%
Road design and maintenance	Bad condition of road	7	163	88	68	86	28	440	8.1
	Narrow road	10	226	119	78	40	35	508	9.3
Driver's behavior	Aggressive driving	9	155	116	40	25	32	377	6.9
	Careless of driver	12	247	155	55	26	43	538	9.9
	Driving with Consuming Alcohol	14	45	32	12	10	2	115	2.1
	Bad over taking	11	148	137	29	19	22	366	6.7
	Lack of awareness of traffic rules	6	173	107	37	21	27	371	6.8
Traffic related issues	Absence of sufficient signs	8	198	111	53	17	29	416	7.6
	Pedestrian/ cattle crossing	5	174	161	62	34	40	476	8.7
	Absence of road sign	4	109	57	39	14	25	248	4.5
	Over speed	1	392	209	73	37	46	758	13.9
	Overtaking	2	378	194	65	38	46	723	13.3
	Heavy freight	3	31	14	3		1	52	1.0
	Unfit Vehicles	13	31	16	4		4	68	1.2



From the above figure, it is clear that the most important reasons for feeling unsafe are over speed, overtaking and carelessness of the drivers, while the bad road condition, reckless road crossing by pedestrian and cattle, aggressive driving and lack of traffic signs are the second important causes for feeling unsafe.

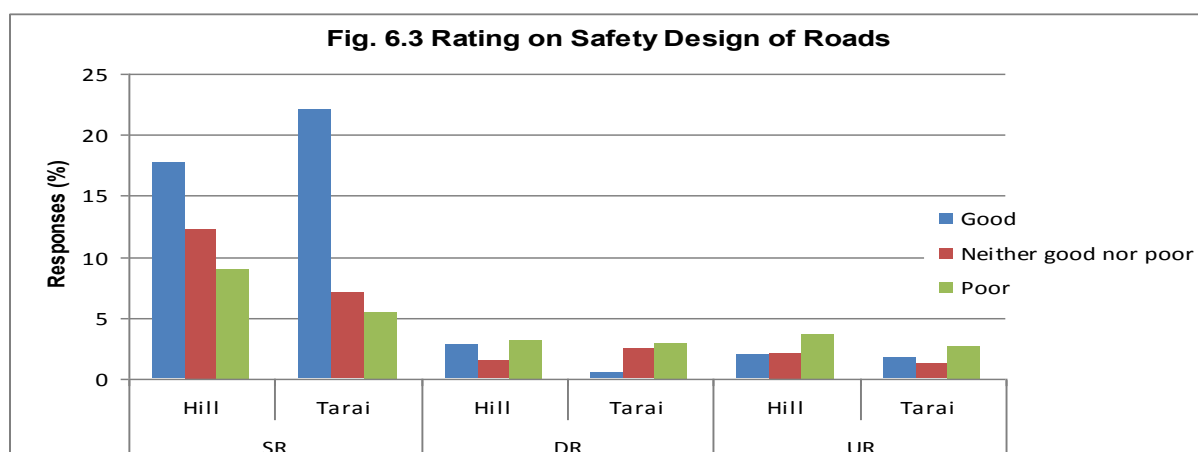
Figure 6.2 shows that 17.4 percent road-users feel unsafe due to bad road condition (8 %) and narrow road (9.3 %). Majority of respondent (43.5%) feel unsafe due to traffic related issues such as lack of awareness of traffic rules, absence of road signs, pedestrian/cattle crossing the road, aggressive overtaking, over speed, heavy freight and unfit vehicles, whereas 25.6 percent feel unsafe due to bad driving behavior such as bad overtaking, aggressive driving, driving with consuming alcohol.

6.3 Road Safety

Table 6.3 shows the respondents’ perception about safety design of road. Majority (47%) of the respondents feel that the safety aspect of roads in Nepal is good, whereas 26 percent feel neither good nor poor and 27 percent as poor. Table 6.3 presents the respondents’ view about road safety ecologically and road wise.

Table 6.3 Rating on Safety Design of Roads (All figures are in percentage)

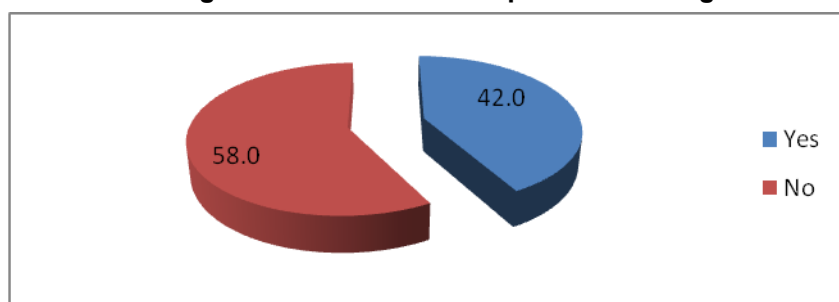
Road safety design is...	SR		DR		UR		Total
	Hill	Terai	Hill	Terai	Hill	Terai	
Good	17.8	22.1	2.7	0.5	1.9	1.7	46.8
Neither good nor poor	12.2	7.0	1.5	2.4	2.1	1.3	26.5
Poor	9.0	5.4	3.1	2.9	3.7	2.7	26.8
Total	39.0	34.5	7.3	5.8	7.7	5.6	100



6.4 Appropriate place to install road signs

During the survey the respondents were asked whether they are satisfied with the current practices for installation of road signs or not. Nearly 58 percent of the respondents were not satisfied with the present practice for installation of road signs. They were either at improper place or insufficient. Only 42 percent were satisfied with the present road signs.

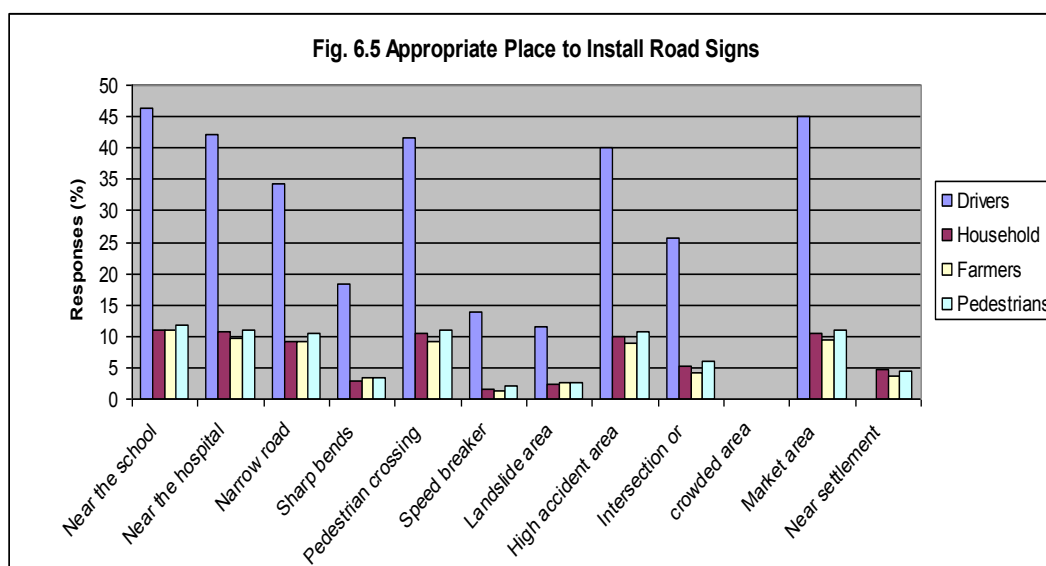
Figure 6.4 Satisfaction on present road signs



Proper traffic rules and road signs reduce road accident. Table-6.4 shows the respondents perception on most appropriate places to install road signs.

Table 6.4 Appropriate place to install the road signs (All figures are in percentage)

Appropriate places ...	Drivers	Household	Farmers	Pedestrians	Total
Near the school	46.4	11.0	11.0	11.8	80.2
Near the hospital	42.1	10.7	9.6	11.0	73.4
Narrow road	34.2	9.2	9.1	10.4	63.0
Sharp bends	18.2	2.8	3.5	3.5	28.0
Pedestrian crossing	41.5	10.5	9.2	10.9	72.1
Speed breaker	13.8	1.5	1.2	2.0	18.6
Landslide area	11.4	2.3	2.7	2.7	19.1
High accident area	40.0	10.0	8.8	10.7	69.5
Intersection or crowded area	25.7	5.2	4.3	6.0	41.2
Market area	45.1	10.4	9.4	11.1	76.0
Near settlement	0.0	4.8	3.6	4.5	12.9

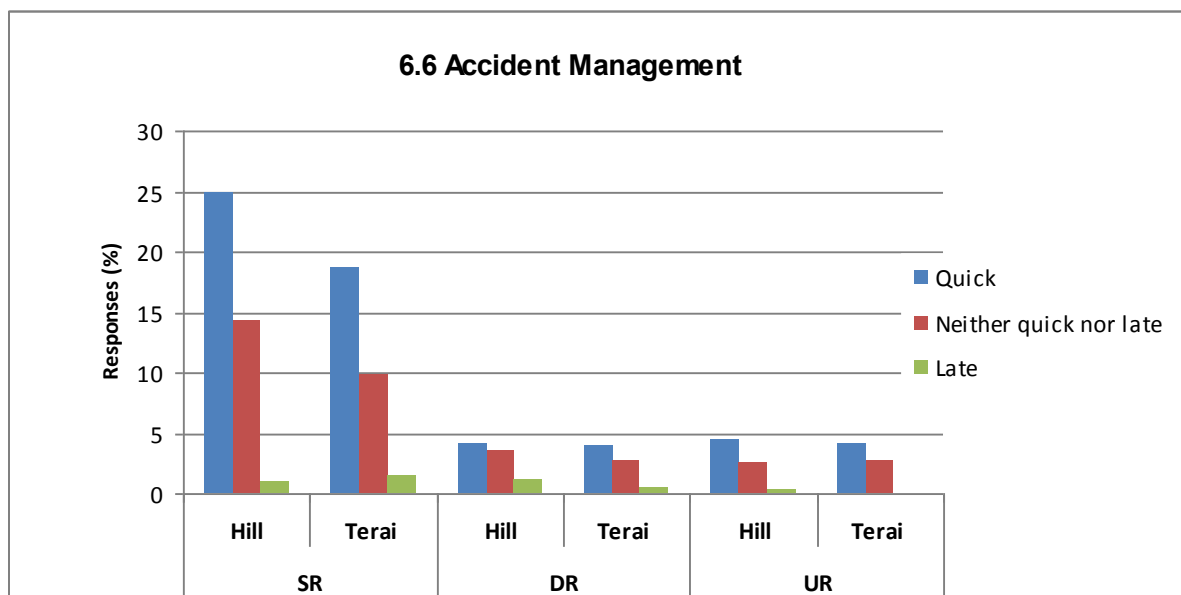


6.5 Accident Management

Overall 60 percent of the respondents feel accident management and time to clear the road is 'Quick'. Comparatively accident management system is better in strategic road network than in other roads.

Table 6.5 Accident Management (All figures are in percentage)

Accident Management	SR		DR		UR		Total
	Hill	Terai	Hill	Terai	Hill	Terai	
Quick	24.9	18.8	4.1	3.9	4.4	4.1	60.3
Neither quick nor late	14.2	9.8	3.5	2.7	2.6	2.8	35.5
Late	0.9	1.4	1.2	0.5	0.3	0.0	4.2
Total	40.1	30.0	8.8	7.1	7.2	6.9	100

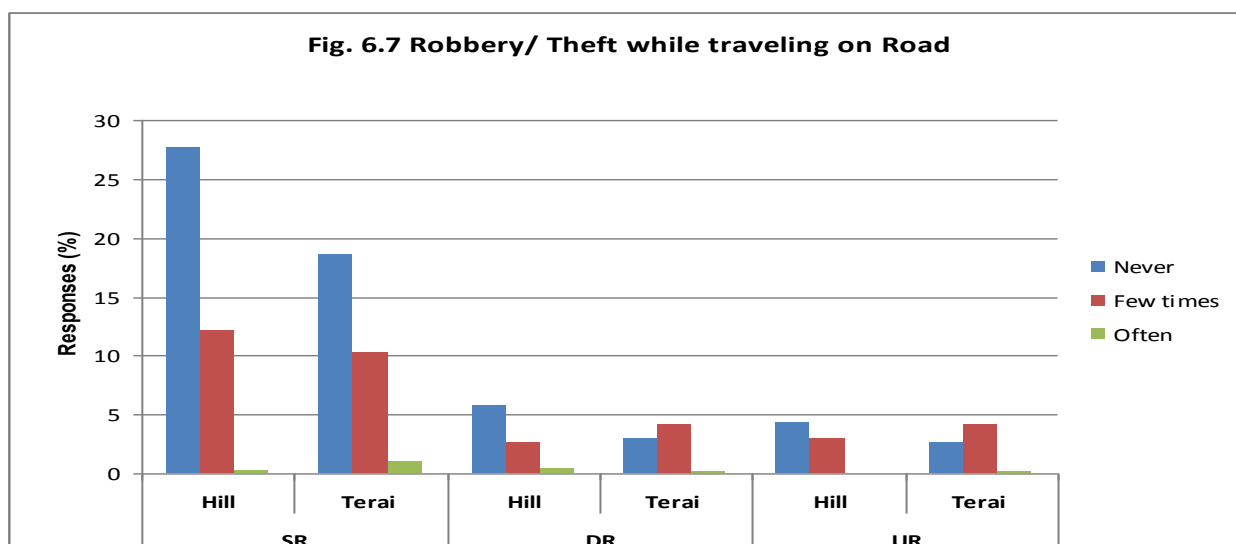


6.6 Robbery/theft

Table 6.6 shows the respondents' experience about robbery/theft while driving or traveling through roads in Nepal. These include loss or theft of small personnel belongings, pick pocketing at or nearby the road areas, robberies at public vehicle or nearby the roads. Road users view that the presence of roads has further increased such activities. Comparatively strategic roads are safer than district and urban roads. Majority of the respondents (62 percent) do not have any experience of robbery or theft while traveling on roads in Nepal while the rest of them have experienced it few times. Figure 6.7 shows details of respondent perception.

Table 6.6 Robbery/ Theft while traveling on Roads in Nepal (All figures are in percentage)

Robbery/ Theft while traveling on this Road.....	SR		DR		UR		Total	%
	Hill	Terai	Hill	Terai	Hill	Terai		
Never	719	486	149	75	112	68	1609	61.8
Few times	317	269	68	107	75	107	943	36.2
Often	7	25	11	3	1	4	51	2.0
Total	1043	780	228	185	188	179	2603	100

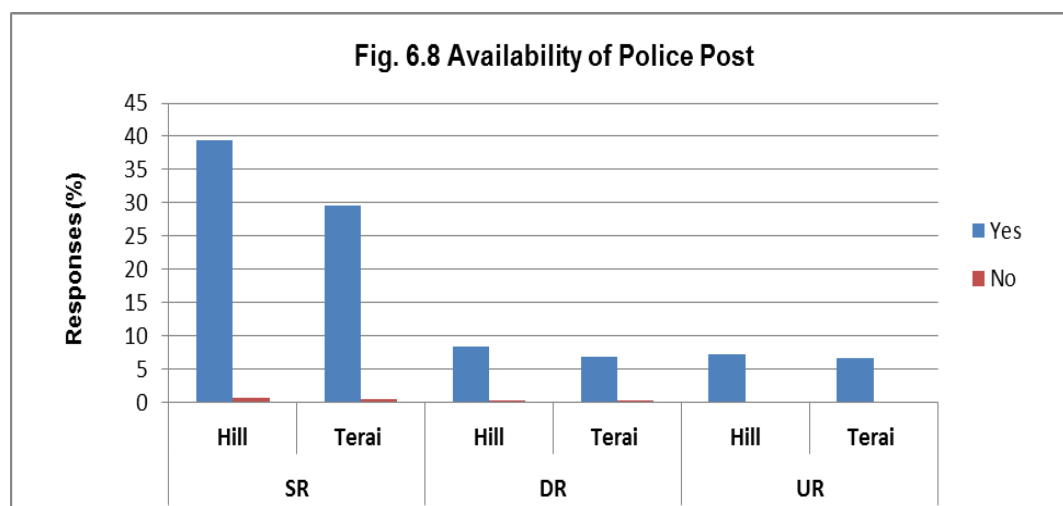


6.7 Availability of police post

Almost all of the respondents said that the availability and accessibility of police post is easy. Fig. 6.8 shows the road users' perception about availability of police post.

Table 6.7 Availability of Police Post (All figures are in percentage)

Availability of police post.....	SR		DR		UR		Total
	Hill	Terai	Hill	Terai	Hill	Terai	
Yes	39.45	29.54	8.45	6.84	7.22	6.68	98.19
No	0.61	0.42	0.31	0.27	0.00	0.19	1.81

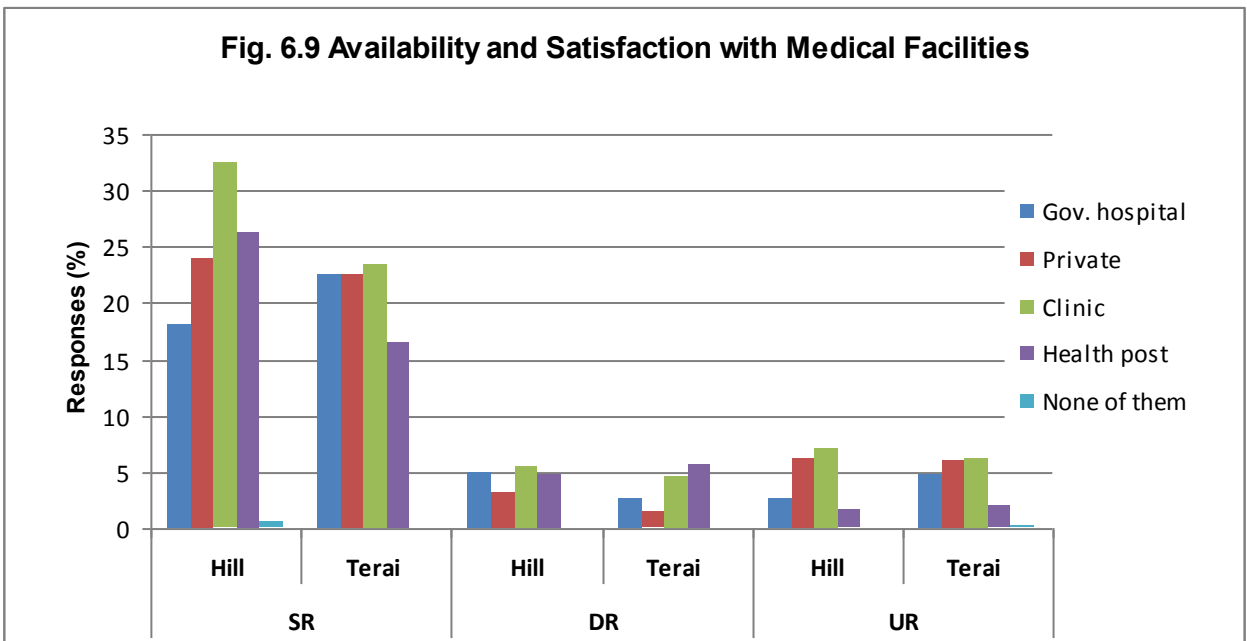


6.8 Availability and Satisfaction with Medical Facilities

The availability of medical facilities is easy on roads in Nepal. Comparatively medical facilities in Terai roads are better than in hill roads. Table 6.8 below presents the responses on the availability and satisfaction of medical facilities on each type of roads in hill and Terai region of Nepal.

Table 6.8 Availability and Satisfaction with Medical Facilities (All figures are in percentage)

Medical facilities	SR		DR		UR		Total
	Hill	Terai	Hill	Terai	Hill	Terai	
Gov. hospital	18.2	22.6	5.0	2.7	2.7	4.9	56.1
Private	23.9	22.5	3.2	1.5	6.2	6.0	63.4
Clinic	32.5	23.5	5.5	4.6	7.1	6.1	79.4
Health post	26.3	16.5	4.9	5.7	1.6	2.0	57.0
None of them	0.6	0.1	0.1	0.0	0.0	0.2	1.0



7. TRAVEL AMENITIES

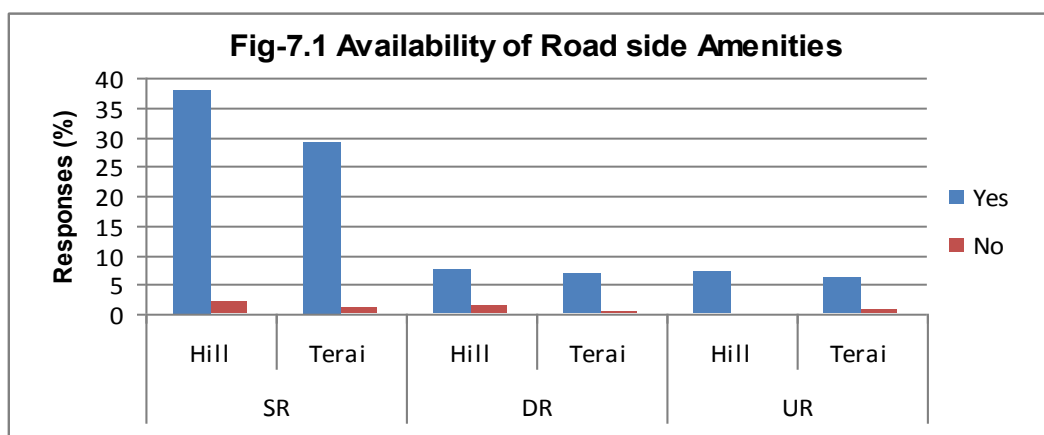
7.1 Availability of Amenities

This section discusses about the availability of road-side amenities such as restaurant, drinking water, petrol pumps etc. In response to the availability of road side amenities or facilities utilized during their journey, majority of the road users reported 'satisfied' with these facilities. Table 7.1 shows respondents' perception about availability of amenities and satisfaction level in different road sections.

Table 7.1 Road-side Amenities (All figures are in percentage)

Satisfaction with Amenities	SR		DR		UR		Total
	Hill	Terai	Hill	Terai	Hill	Terai	
Yes	38.0	29.0	7.4	6.8	7.1	6.3	94.5
No	2.1	0.9	1.4	0.3	0.2	0.6	5.5
Total	40.1	30.0	8.8	7.1	7.2	6.9	100

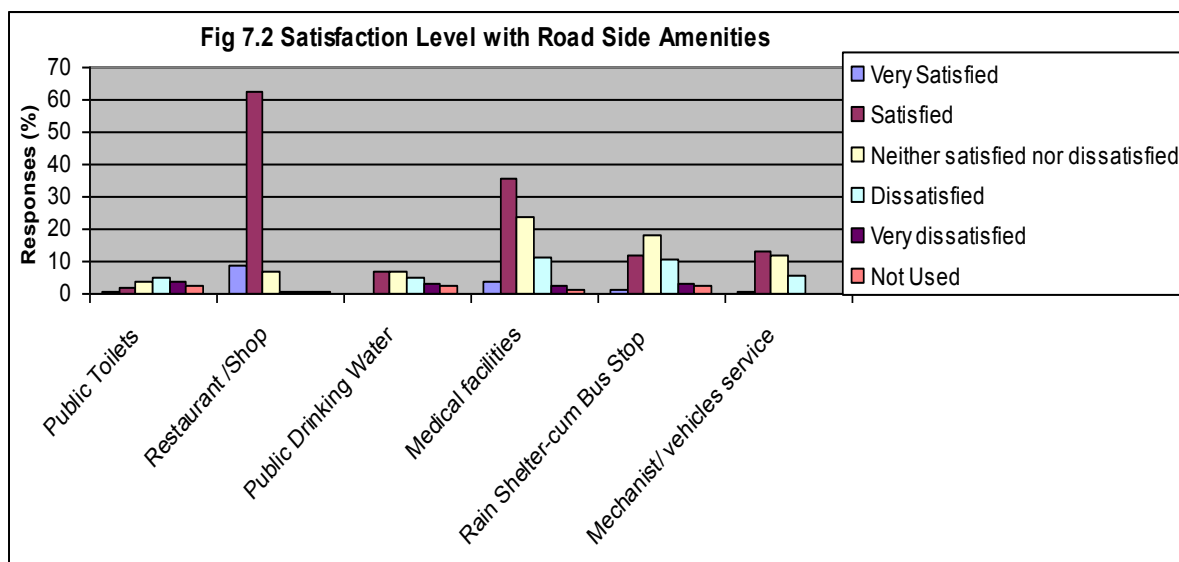
Fig.7.1 below shows that nearly 95 percent of respondents are satisfied with road-side amenities and only 5 percent dissatisfied because of poor quality of services.



Similarly, table 7.2 below shows the respondents' satisfaction level on different types of road-side amenities during their travel.

Table 7.2 Satisfaction level with road side amenities (All figures are in percentage)

Facilities	Very Satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied	Not Used
Public Toilets	0.4	2.1	3.5	5.3	3.6	2.8
Restaurant /Shop	9	62.7	6.6	0.9	0.5	0.5
Public Drinking Water	0.2	7	6.7	5	3.2	2.2
Medical facilities	3.7	35.5	23.7	11.4	2.8	1.5
Rain Shelter-cum Bus Stop	1	12	17.9	10.9	3	2.2
Mechanist/ vehicles service	0.5	13.3	11.9	5.5	0.3	0.2

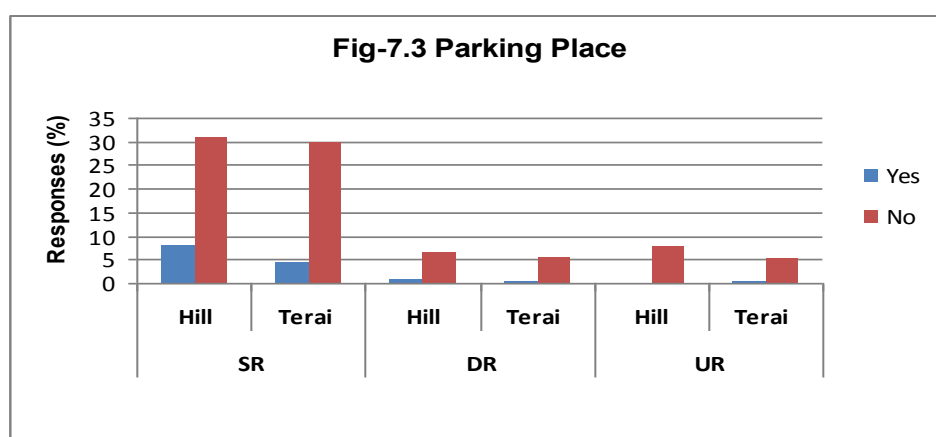


7.2 Parking Facilities

In response to the respondents' satisfaction level with the parking facilities available on different types of roads, majority of road users (86 %) were 'dissatisfied'. Only 14 percent users were 'somewhat satisfied'. During survey, the surveyor found that most of the vehicles were parked on street. Table 7.3 below shows the road users' satisfaction level of road wise and terrain type wise parking facilities available:

Table 7.3 Parking facilities (All figures are in percentage)

Parking place.....	SR		DR		UR		Total
	Hill	Terai	Hill	Terai	Hill	Terai	
Yes	7.9	4.5	0.7	0.3	0.1	0.4	14.0
No	31.1	30.0	6.6	5.5	7.5	5.2	86.0
Total	39.0	34.5	7.3	5.8	7.7	5.6	100



7.3 Availability of petrol pump

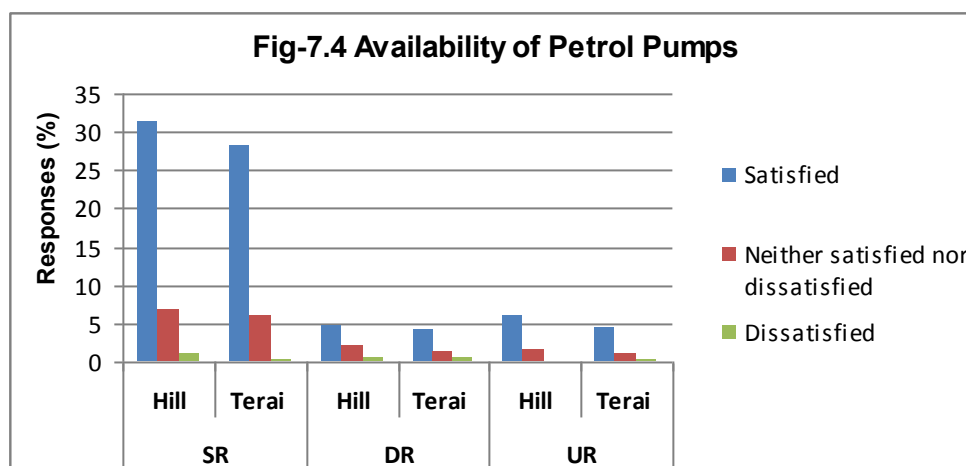
Overall respondent are satisfied with the availability of petrol pumps or fuel station across various roads. Table-7.4 below summarizes the respondents' satisfaction level with the availability of fuel stations along different types of road in hilly and Terai terrain.

Table 7.4 Availability of petrol pump

(All figures are in percentage)

Availability of petrol pumps....	SR		DR		UR		Total
	Hill	Terai	Hill	Terai	Hill	Terai	
Satisfied	31.3	28.1	4.7	4.1	6.1	4.5	78.8
Neither satisfied nor dissatisfied	6.7	6.1	2.1	1.3	1.6	0.9	18.8
Dissatisfied	0.9	0.3	0.6	0.4	0.0	0.1	2.4
Total	39.0	34.5	7.3	5.8	7.7	5.6	100

Fig. 7.4 shows that most of the vehicles drivers (79%) are 'satisfied' with the availability of petrol pumps, whereas 19 percent responded 'neither satisfied nor dissatisfied' and only 2 percent were 'dissatisfied'. Comparatively satisfaction level is higher on strategic roads than district and urban roads.



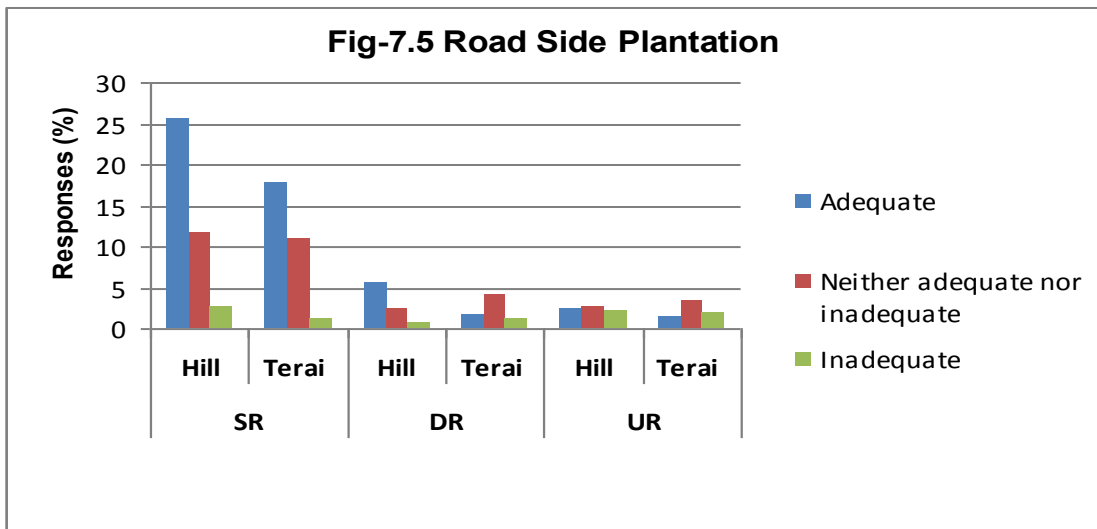
7.4 Road-side plantation

Present study shows that more than 50 percent of respondents said that the road-side plantation is adequate in all road sections, whereas 35 percent said 'neither adequate nor inadequate'. Only 10 percent respondent suggest road-side plantation is inadequate in all types of roads. During the survey, majority of the road users (drivers, road neighbors, pedestrian farmers and local people) suggested that the road agencies have to plant trees when they further expand the roads. Table 7.5 below shows the respondents' perception about road side plantation:

Table 7.5 Road side plantation

(All figures are in percentage)

Road side plantation	SR		DR		UR		Total
	Hill	Terai	Hill	Terai	Hill	Terai	
Adequate	25.6	17.7	5.6	1.8	2.5	1.6	54.7
Neither adequate nor inadequate	11.6	11.0	2.4	4.0	2.7	3.3	35.1
Inadequate	2.8	1.2	0.8	1.3	2.1	2.0	10.2
Total	40.1	30.0	8.8	7.1	7.2	6.9	100



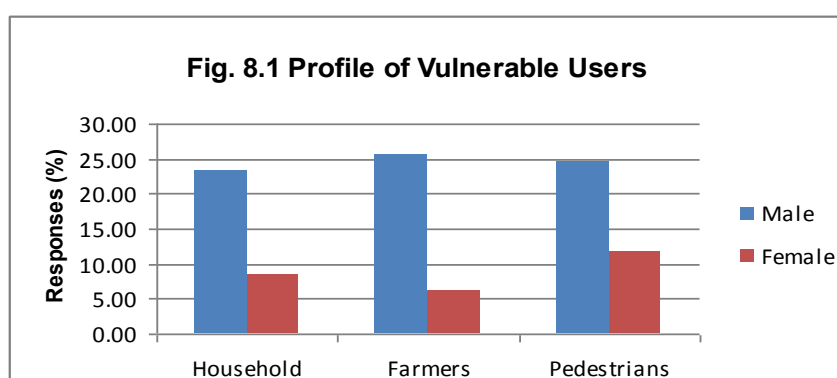
8. VULNERABLE USERS

8.1 Profile of Vulnerable Users

This chapter describe about vulnerable user's profile and their satisfaction level, perception, experience and awareness about existing road. During the survey, 1106 vulnerable users mainly the non-motorized traffic (household, pedestrians and farmers etc.) were interviewed in all 50 service centers. Among vulnerable users, 817 were male and 289 female. Table 8.1 below shows respondents' profile by gender.

Table 8.1 Profile of Vulnerable Users

Respondents Group	Male		Female		Total	
	No	%	No	%	No	%
Household	260	23.5	92	8.3	352	31.8
Farmers	285	25.8	68	6.1	353	31.9
Pedestrians	272	24.6	129	11.7	401	36.3
Total	817	73.9	289	26.1	1106	100

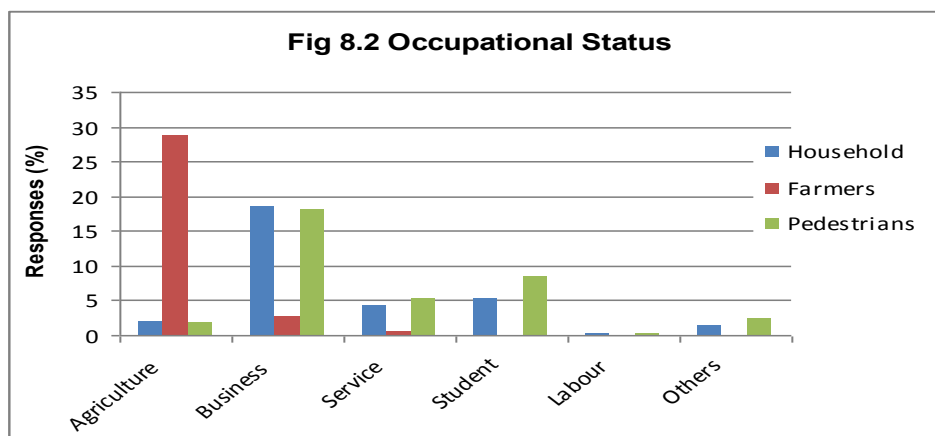


8.2 Occupational status of Respondent

Overall survey shows that majority of respondents (33 to 40 %) are engaged in business and agriculture, whereas 10 to 14 percent respondents were in service holders and student. Fig. 8.2 below shows the occupational status of all respondent from vulnerable users.

Table 8.2 Occupational Status of Vulnerable Users

Occupation	Household		Farmers		Pedestrians		Total	
	Nos	%	Nos	%	Nos	%	Nos	%
Agriculture	23	2.1	318	28.8	20	1.8	361	32.6
Business	206	18.6	29	2.6	200	18.1	435	39.3
Service	47	4.2	5	0.5	60	5.4	112	10.1
Student	58	5.2	0	0.0	92	8.3	150	13.6
Labour	3	0.3	0	0.0	3	0.3	6	0.5
Others	15	1.4	1	0.1	26	2.4	42	3.8

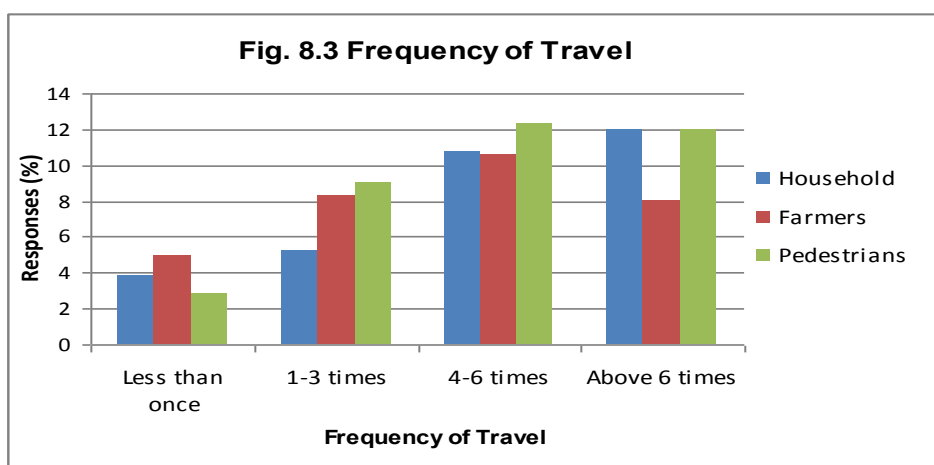


8.3 Frequency of Travel

In response to their frequency of travel on roads in Nepal, majority of respondents, nearly 34 percent travel 4-6 times in a week and 32 percent use them above six times in a week. Respondents traveling 1-3 times in a week were 23 percent and only 12 percent travel less than once week. Table-8.3 below shows the detail travel status of all respondents interviewed:

Table 8.3 Frequency of travel

Frequency of travel	Household		Farmers		Pedestrians		Total	
	Nos	%	Nos	%	Nos	%	Nos	%
Less than once	42	4	55	5	31	3	128	12
1-3 times	58	5	92	8	100	9	250	23
4-6 times	119	11	117	11	137	12	373	34
Above 6 times	133	12	89	8	133	12	355	32
Total	352	32	353	32	401	36	1106	100

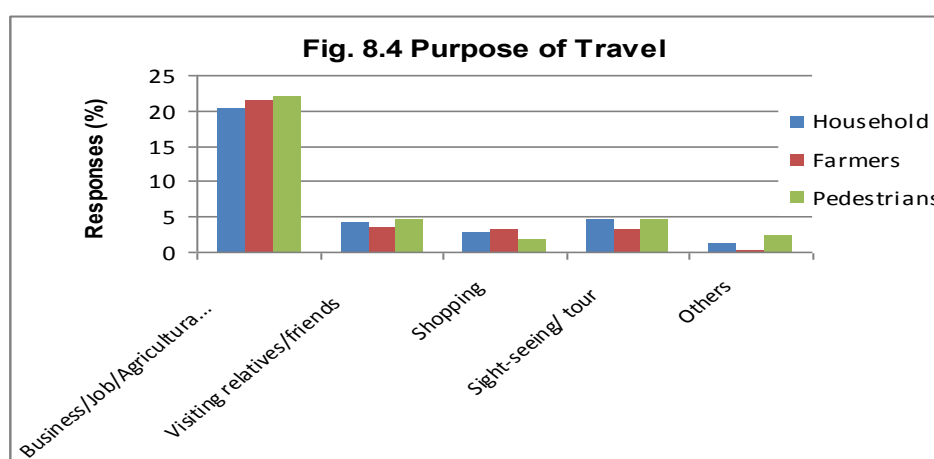


8.4 Purpose of Travel

Present study shows that nearly 64 percent of the respondents frequently use the road for business/job/agricultural purpose, whereas 12 percent use for visiting relatives and friends, 12 percent for sightseeing and leisure propose, and 4 percent for other various purposes. Table 8.4 shows the detail of responses:

Table 8.4 Purpose of travel

Purpose of Travel	Household		Farmers		Pedestrians		Overall	
	No	%	No	%	No	%	No	%
Business/Job/Agricultural work	305	20.3	323	21.5	330	22.0	958	63.8
Visiting relatives/friends	63	4.2	51	3.4	68	4.5	182	12.1
Shopping	43	2.9	49	3.3	27	1.8	119	7.9
Sight-seeing/ tour	70	4.7	48	3.2	68	4.5	186	12.4
Others	18	1.2	3	0.2	36	2.4	57	3.8

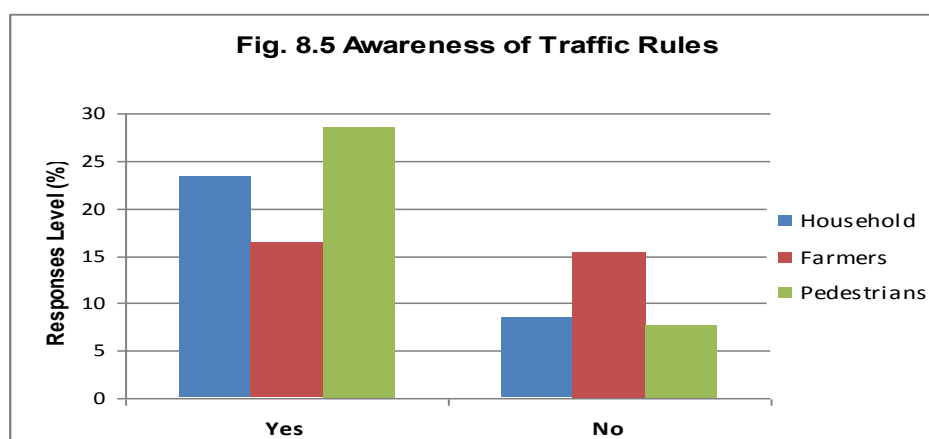


8.5 Awareness of Traffic Rules

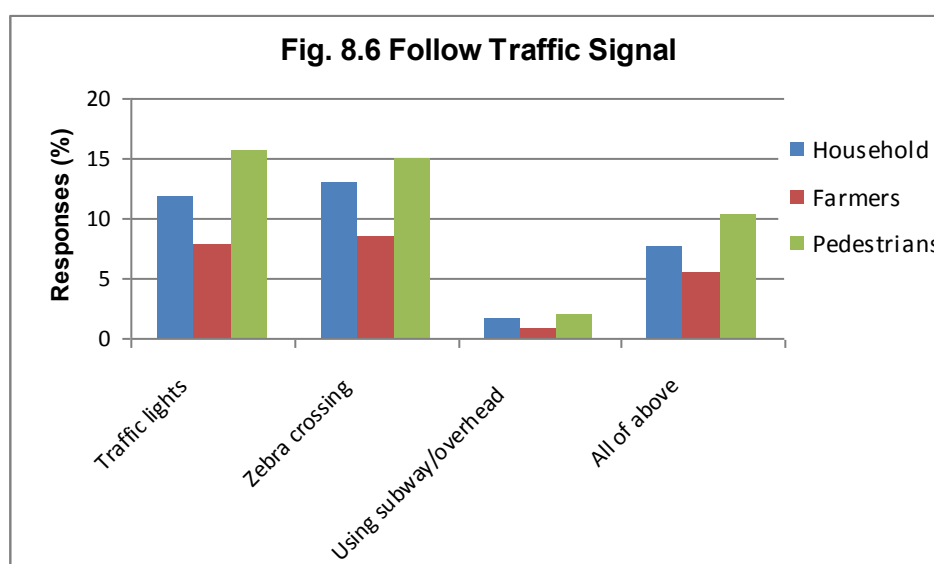
Among the respondents, more than 68 percent were aware of traffic rules and regulation while 32 percent were unaware of them. During the field work, the research team found that the respondents from eastern and central regions were more conscious about traffic rules and regulations than those from western and far-western regions. Table 8.5 below shows the respondents' degree of awareness about traffic rules and signals.

Table 8.5 Awareness of traffic rules

Traffic signal		Household		Farmers		Pedestrians		Total	
		No	%	No	%	No	%	No	%
Awareness about.....	Yes	259	23.4	182	16.5	316	28.6	757	68.4
	No	93	8.4	171	15.5	85	7.7	349	31.6
Follow Signal	Traffic lights	136	11.9	89	7.8	180	15.7	405	35.4
	Zebra crossing	148	12.9	98	8.6	172	15.0	418	36.5
	Using subway	20	1.7	9	0.8	22	1.9	51	4.5
	All of above	88	7.7	63	5.5	119	10.4	270	23.6



From Table 8.5 and Fig. 8.5, we can say that out of the total sample size, 68 percent of the respondents are fully aware of traffic rules and regulations while nearly 24 percent of them follow all the traffic rules and regulations and the rest of them follow partially.

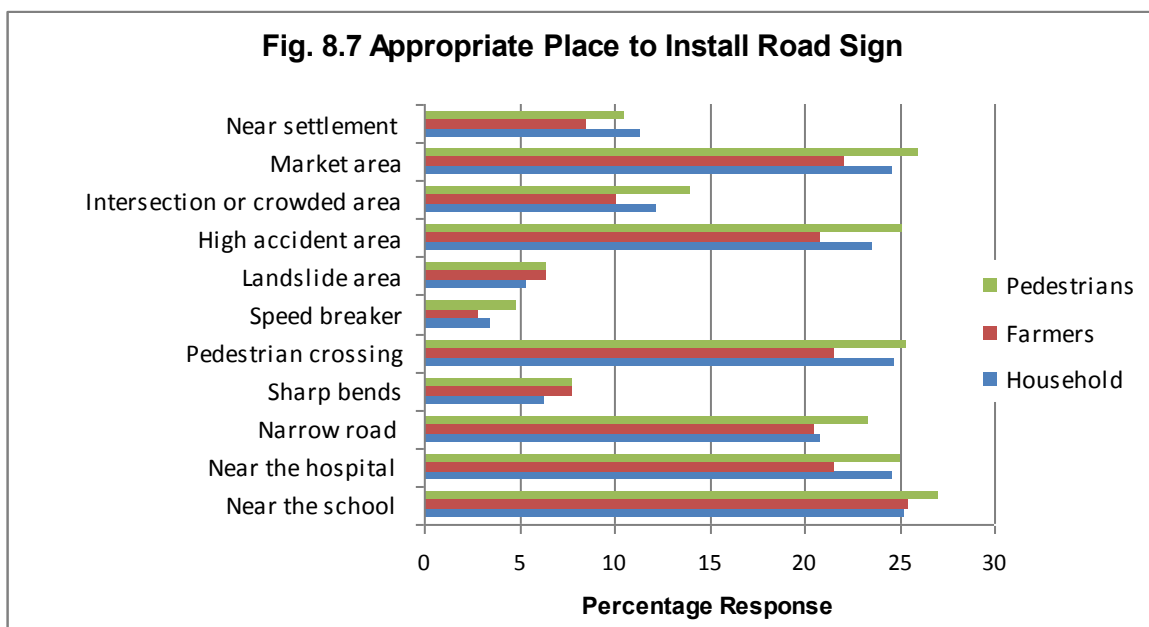


8.6 Appropriate Place to install road Signs

Survey data on road users' attributes regarding the appropriate place for installation of road signs are given in table 8.6 and presented in fig. 8.6 below:

Table 8.6 Appropriate place to install road signs

Places.....	Household		Farmers		Pedestrians		Total	
	No	%	No	%	No	%	No	%
Near the school	279	25.2	282	25.5	299	27.0	860	77.8
Near the hospital	273	24.7	239	21.6	277	25.0	789	71.3
Narrow road	231	20.9	227	20.5	258	23.3	716	64.7
Sharp bends	70	6.3	86	7.8	86	7.8	242	21.9
Pedestrian crossing	274	24.8	239	21.6	280	25.3	793	71.7
Speed breaker	38	3.4	31	2.8	53	4.8	122	11.0
Landslide area	59	5.3	71	6.4	71	6.4	201	18.2
High accident area	261	23.6	230	20.8	278	25.1	769	69.5
Intersection or crowded area	135	12.2	112	10.1	155	14.0	402	36.3
Market area	272	24.6	244	22.1	288	26.0	804	72.7
Near settlement	126	11.4	94	8.5	116	10.5	336	30.4



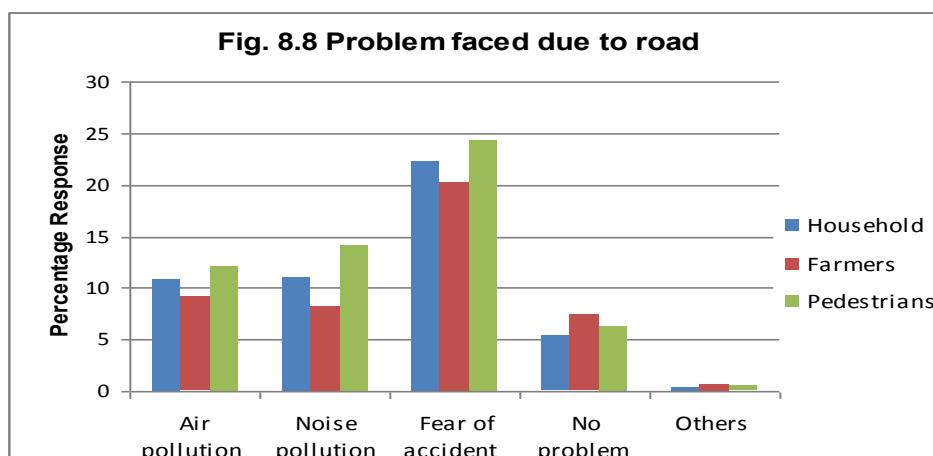
From Fig 8.7, it is clear that nearly 70 to 78 percent of the respondents suggested the appropriate places for installation of the traffic signs near school, hospital, pedestrian crossing, market areas, high accidental areas and narrow roads while the other places have been given less priority.

8.7 Problems Facing due to Road

Over fifty percent respondents have been residing adjacent to different types of roads for more than 20 years. They were asked what type of problem they face due to road nearby. Majority of respondents (67%) face problems due to road accident and nearly 33 percent face problem due to air and noise pollution while 19 percent of them have hardly any problem from road. Table 8.7 below shows the respondent feeling about the problem faced due to road nearby:

Table 8.7 Problem Facing due to Road Nearby

Factors	Household		Farmers		Pedestrians		Total	
	No	%	No	%	No	%	No	%
Air pollution	119	10.8	100	9.0	133	12.0	352	31.8
Noise pollution	121	10.9	91	8.2	156	14.1	368	33.3
Fear of accident	247	22.3	224	20.3	270	24.4	741	67.0
No problem	59	5.3	82	7.4	69	6.2	210	19.0
Others	4	0.4	7	0.6	5	0.5	16	1.4

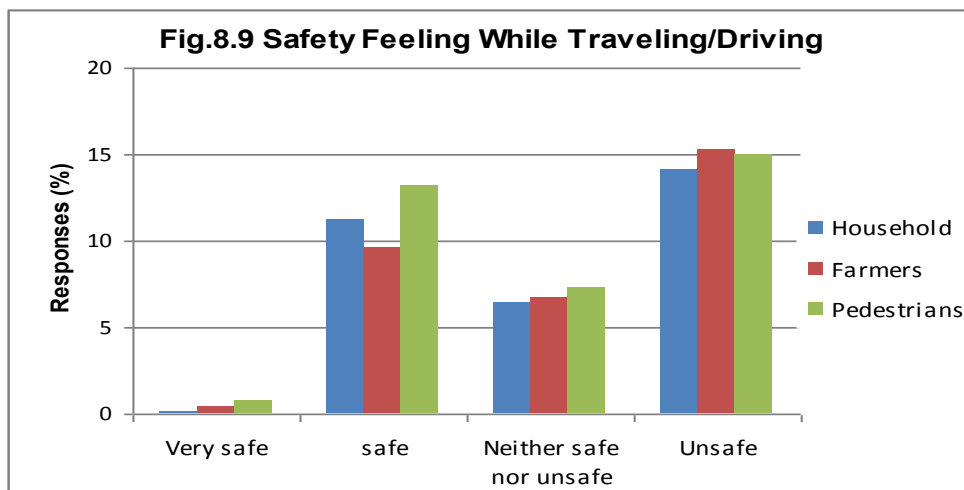


8.8 Safety Feeling while travelling/driving

Safety is the major concern of the vulnerable users as they are more prone to various mishaps and accidents along the road. Attributes on safety feeling of various respondents is given in table 8.8:

Table 8.8 Safety feeling while traveling/driving

Safety feeling while traveling/driving	Household		Farmers		Pedestrians		Total	
	Nos	%	Nos	%	Nos	%	Nos	%
Very safe	1	0.1	4	0.4	8	0.7	13	1.2
safe	124	11.2	106	9.6	146	13.2	376	34.0
Neither safe nor unsafe	71	6.4	74	6.7	81	7.3	226	20.4
Unsafe	156	14.1	169	15.3	166	15.0	491	44.4
Total	352		353		401		1106	



From fig. 8.8, it is clear that majority of respondents, nearly 45 percent feel unsafe and 34 percent feel safe while traveling or driving on roads in Nepal. 21 percent of them feel neither safe nor unsafe while only 1 percent feels very safe.

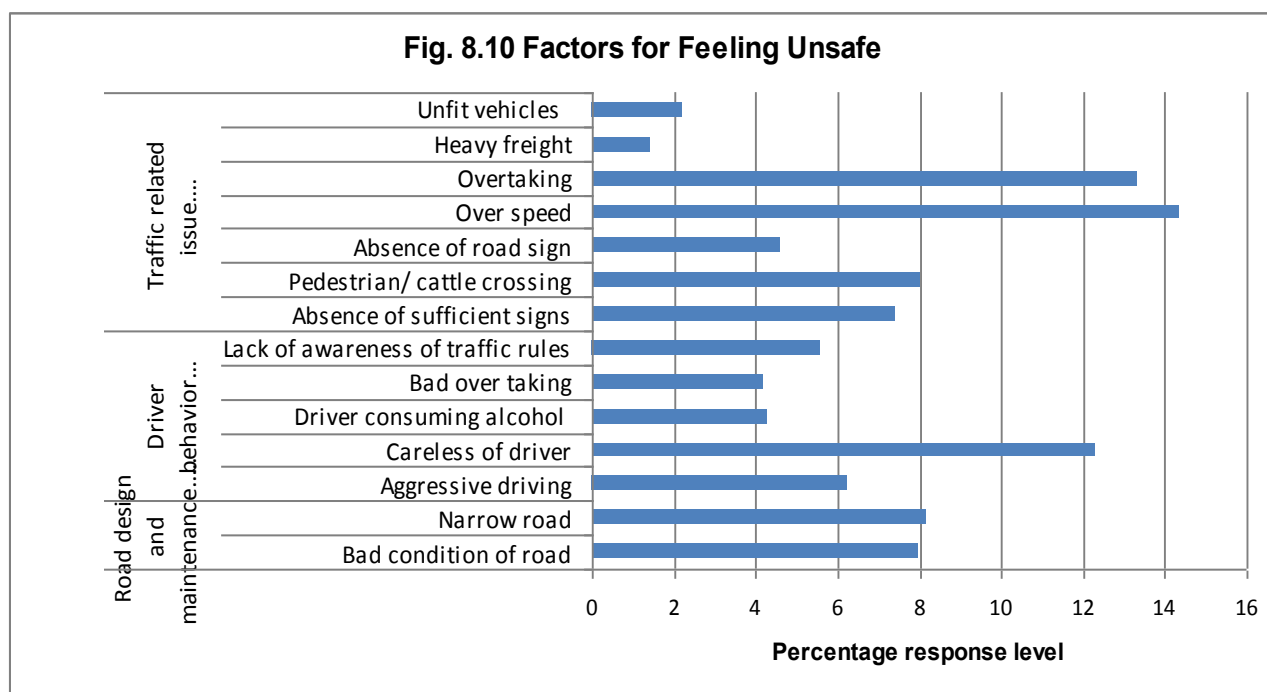


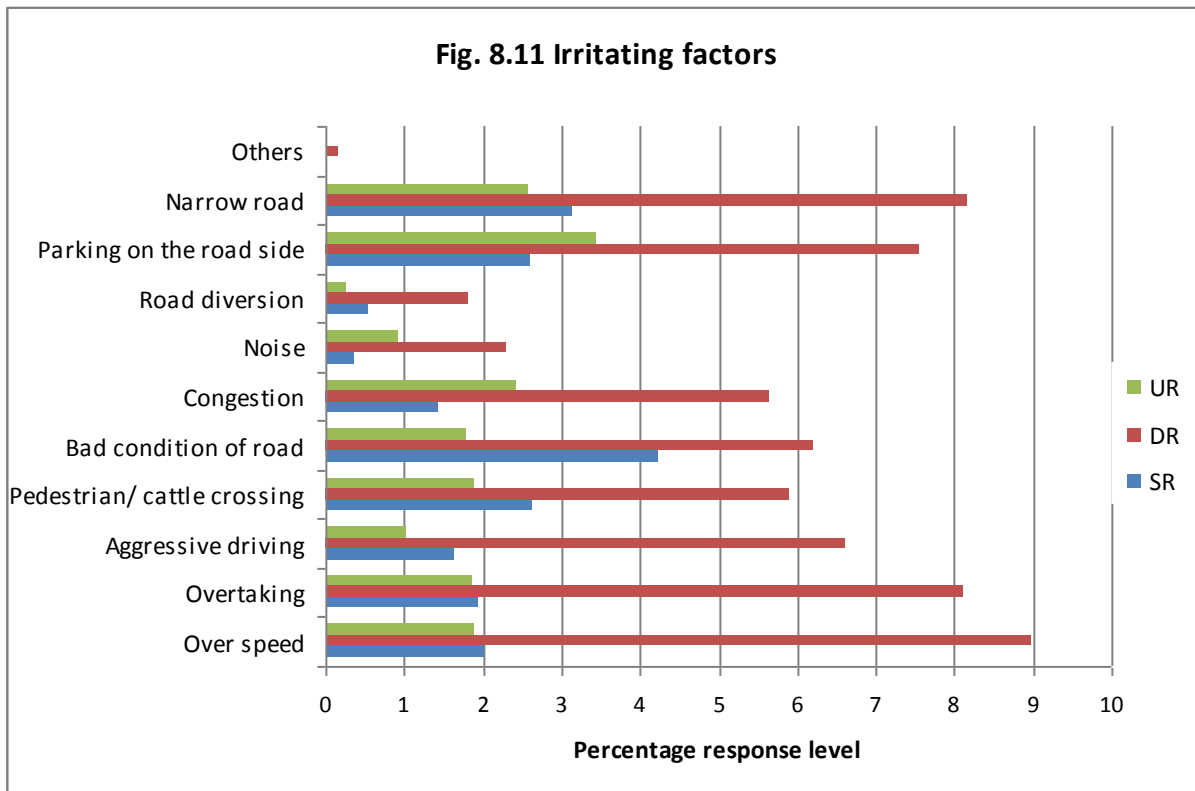
Figure 8.10 above shows the respondent perception on different factors which make them feel unsafe while traveling on various types of road. From the figure we can say that the most important factors for feeling unsafe are overtaking, over speed, carelessness of drivers while the pedestrian/cattle crossing, absence of sufficient road signs, narrow roads, bad condition of roads and aggressive driving etc. are the second most important factors.

8.9 Irritating factors for Vulnerable Users

Responses on various factors which make the road users irritate have been summarized in Table 8.9 and presented in Fig. 8.11.

Table 8.9 irritating factors for Vulnerable Users

Irritating factor	SR		DR		UR		Total	
	No	%	No	%	No	%	No	%
Over speed	74	2.0	329	9.0	69	1.9	472	12.9
Overtaking	71	1.9	297	8.1	68	1.9	436	11.9
Aggressive driving	60	1.6	242	6.6	37	1.0	339	9.3
Pedestrian/ cattle crossing	96	2.6	216	5.9	69	1.9	381	10.4
Bad condition of road	155	4.2	227	6.2	65	1.8	447	12.2
Congestion	52	1.4	207	5.7	89	2.4	348	9.5
Noise	13	0.4	84	2.3	34	0.9	131	3.6
Road diversion	20	0.5	66	1.8	9	0.2	95	2.6
Parking on the road side	95	2.6	277	7.6	126	3.4	498	13.6
Narrow road	115	3.1	299	8.2	94	2.6	508	13.9
Others	1	0.0	6	0.2	1	0.0	8	0.2



From Fig. 8.11, major irritating factors for vulnerable users are over speed, narrow roads, overtaking, parking on the road side and aggressive driving. Congestion, bad condition of roads and pedestrian/cattle crossing the road are the second most irritating factors while noise and others were comparatively less irritating.

9. PERCEPTION ABOUT ROAD AGENCIES

9.1 Road Agencies

This chapter elicits road-users' perceptions to various questions that reflect the performance of road agencies namely the Department of Roads (DoR), Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR) and Roads Board Nepal (RBN), and the local governments mainly District Development Committees (DDC) and Municipalities, and similar other organizations involved in road management. Perceptions also reflect their acknowledgement of appropriate road agency and promptness to address various road related problems.

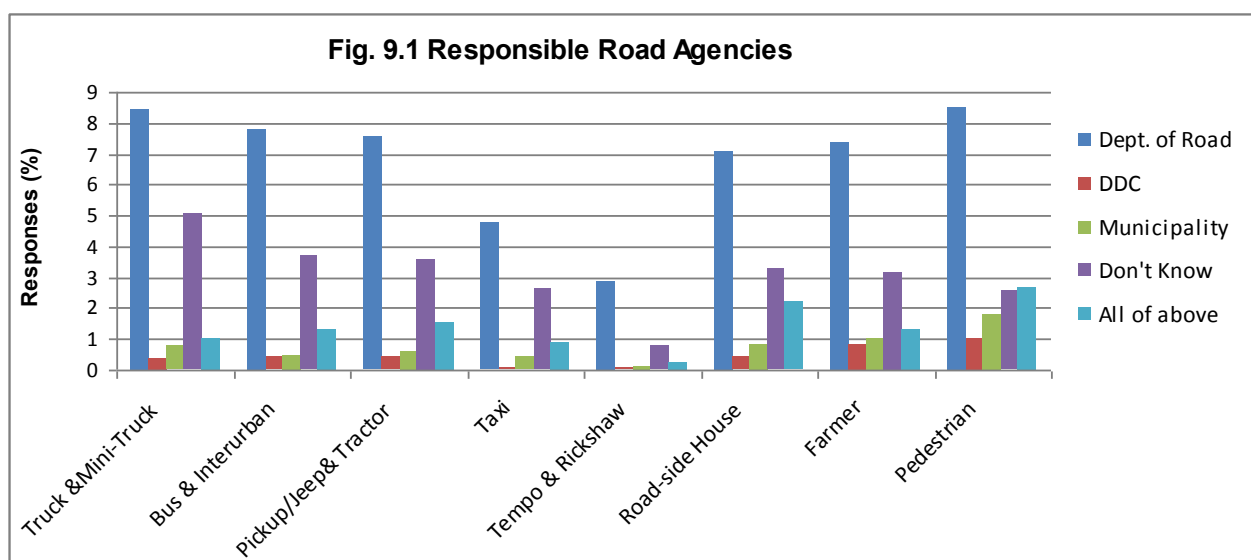
9.2 Perception about Road Agencies

During the survey the respondent were asked which agency they felt was responsible for the road maintenance. Responses to this question are summarized in Table 9.1 and presented in chart (Fig. 9.1) below:

Table 9.1 Road Agency Responsible for Maintenance (All figures are in percentage)

Responsible Agencies	Distribution of Responses								Overall
	Drivers					Vulnerable Users			
	Truck & Mini-Truck	Bus & Inter-urban	Pickup/Jeep & Tractor	Taxi	Tempo & Rickshaw	Road-side House	Farmer	Pedestrian	
Dept. of Road	8.5	7.8	7.6	4.8	2.9	7.1	7.4	8.5	54.5
DDC	0.4	0.4	0.4	0.1	0.0	0.4	0.8	1.0	3.5
Municipality	0.8	0.5	0.6	0.4	0.1	0.8	1.0	1.8	6.1
Don't Know	5.1	3.7	3.6	2.6	0.8	3.3	3.1	2.6	24.8
All of above	1.0	1.3	1.5	0.9	0.3	2.2	1.3	2.7	11.2

From the respondents' perception as seen from fig. 9.1, nearly 55 percent of them regard the DoR as the main responsible agency for road maintenance activities, 25 percent of the them were not sure of the organization that is responsible for maintenance and 11 percent assume all agencies responsible for it. Levels of Attributes on DDC's and municipalities were 4 and 6 percent respectively.



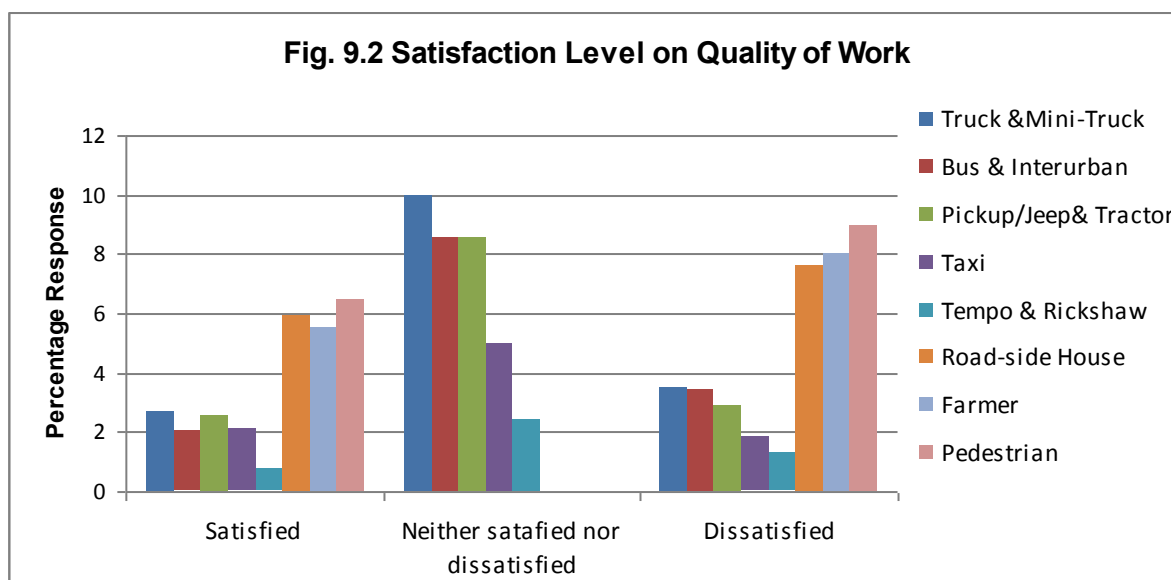
9.3 Quality of Road Maintenance

Road-users' perception regarding the quality of road maintenance works carried out by DOR/DDC/Municipality in terms of satisfaction level as 'satisfied', 'neither satisfied nor dissatisfied' and 'poor' during the survey has been given in Table 9.2 and the outcome presented in fig. 9.2 below:

Table 9.2 Satisfaction with road maintenance organizations (All figures are in percentage)

Quality of Work	Distribution of Responses in Percentage								
	Drivers					Vulnerable Users			Overall
	Truck & Mini-Truck	Bus & Interurban	Pickup/Jeep & Tractor	Taxi	Tempo & Rickshaw	Road-side House	Farmer	Pedestrian	
Satisfied	2.7	2.0	2.6	2.1	0.7	5.9	5.5	6.5	28.0
Neither satisfied nor dissatisfied	10.0	8.5	8.6	5.0	2.4	0.0	0.0	0.0	34.5
Dissatisfied	3.5	3.4	2.9	1.8	1.3	7.6	8.0	9.0	37.5
Total	16.2	13.9	14.0	8.9	4.5	13.5	13.6	15.4	100

Figure 9.2 shows that 28% of the road-users found the quality of road works as satisfactory, whereas 34% of them found the quality to be 'neither satisfied nor dissatisfied'. About 38% of the users responded the quality to be dissatisfactory.



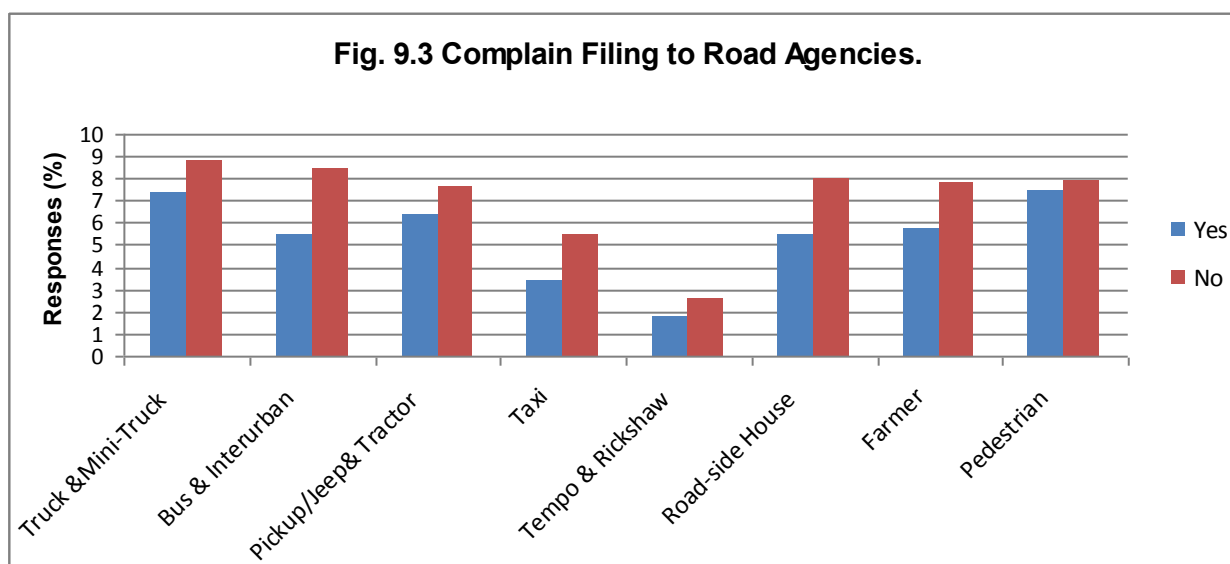
9.4 Promptness to Complaint Redress

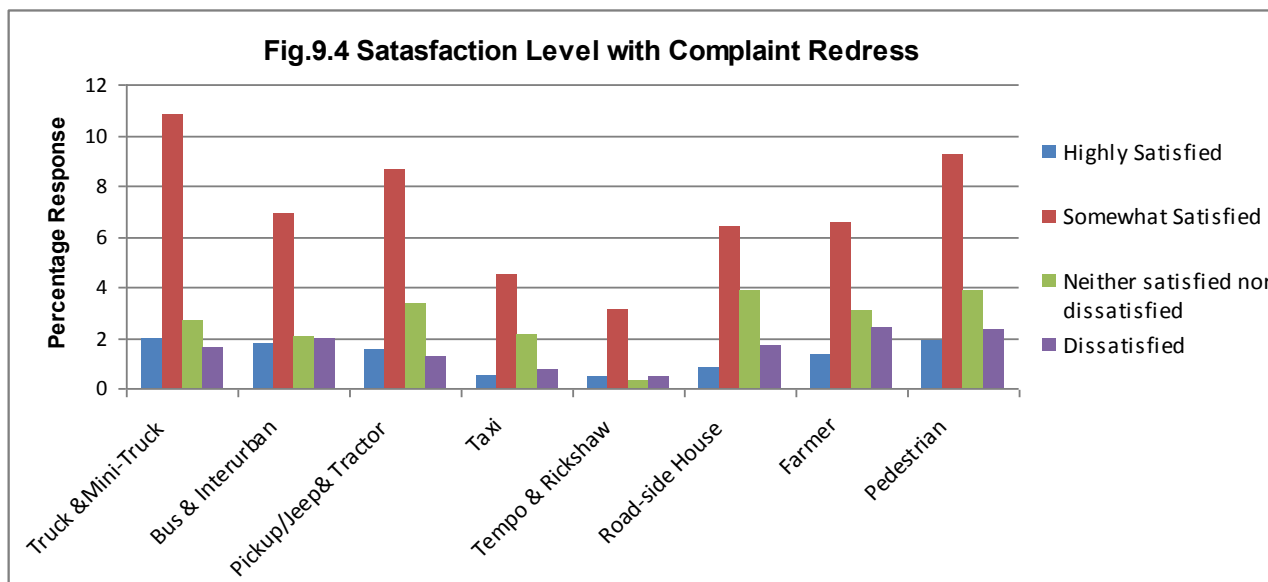
During the survey the respondent were asked whether they made any complain to road agencies or not and promptness to redress their complaints, if made. Responses from different users' have been given in Table 9.3:

Table 9.3 Complaint redress and problem resolving on time (All figures are in percentage)

Complain....	Distribution of Responses								Overall
	Drivers					Road-side House	Farmer	Pedestrian	
	Truck & Mini-Truck	Bus & Interurban	Pickup/Jeep & Tractor	Taxi	Tempo & Rickshaw				
Yes	7.4	5.5	6.4	3.4	1.8	5.5	5.8	7.5	43.2
No	8.8	8.5	7.6	5.5	2.6	8.0	7.8	8.0	56.8
Satisfaction with complain redress.....									
Highly Satisfied	2.0	1.8	1.5	0.5	0.4	0.8	1.3	1.9	10.2
Somewhat Satisfied	10.8	6.9	8.6	4.5	3.1	6.4	6.6	9.2	56.3
Neither Satisfied - Nor Dissatisfied	2.7	2.0	3.4	2.1	0.3	3.8	3.0	3.8	21.2
Dissatisfied	1.6	2.0	1.2	0.7	0.4	1.7	2.4	2.3	12.4

From the above Table 9.3, only 43 percent of the respondents have ever made complain to road agencies regarding any type of road related problems, out of which only 10 percent were highly satisfied, 56 percent somewhat satisfied, 21 percent neither satisfied nor dissatisfied and 12 percent dissatisfied with the complaint redressal practices. Nearly 57 percent of the respondents have never made any complaint to road agencies.



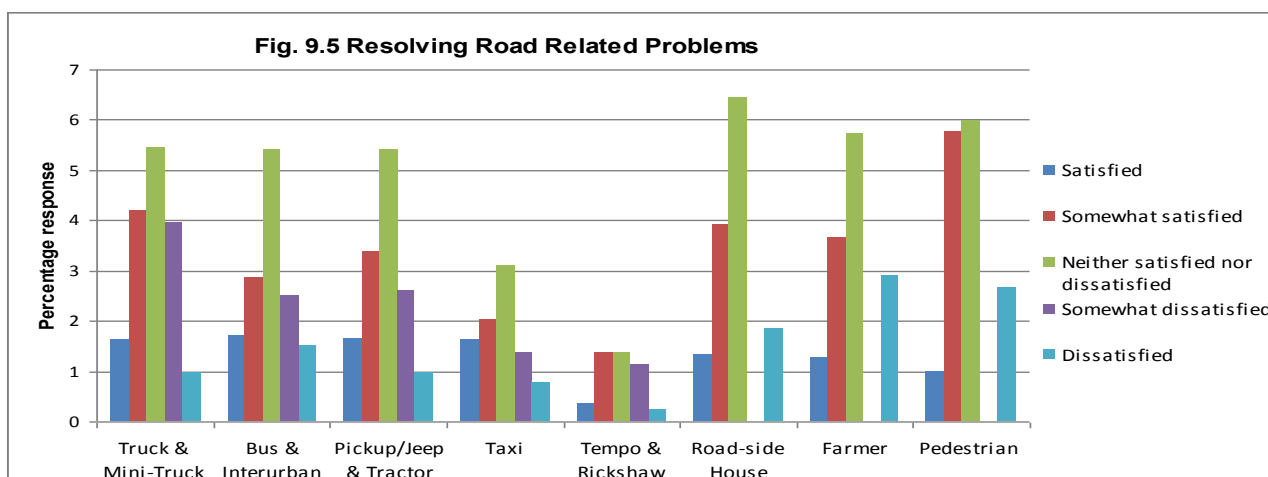


9.5 Resolving Road Related Problems

On enquiry to the respondents' level of satisfaction on resolving the maintenance, quality and repair of road related problems in time, responses from various road users' are shown in Table 9.4 and presented in chart as shown in fig. 9.5:

Table 9.4 Responses to resolving road related problems (All figures are in percentage)

Resolving problem in time.....	Distribution of Responses (%)								Overall
	Drivers								
	Truck & Mini-Truck	Bus & Interurban	Pickup/Jeep & Tractor	Taxi	Tempo & Rickshaw	Road-side House	Farmer		
Satisfied	1.6	1.7	1.7	1.6	0.3	1.3	1.3	1.0	10.5
Somewhat satisfied	4.2	2.8	3.4	2.0	1.4	3.9	3.6	5.8	27.2
Neither satisfied nor dissatisfied	5.5	5.4	5.4	3.1	1.4	6.5	5.7	6.0	39.0
Somewhat dissatisfied	4.0	2.5	2.6	1.4	1.1	0.0	0.0	0.0	11.6
Dissatisfied	1.0	1.5	1.0	0.8	0.2	1.8	2.9	2.7	11.8

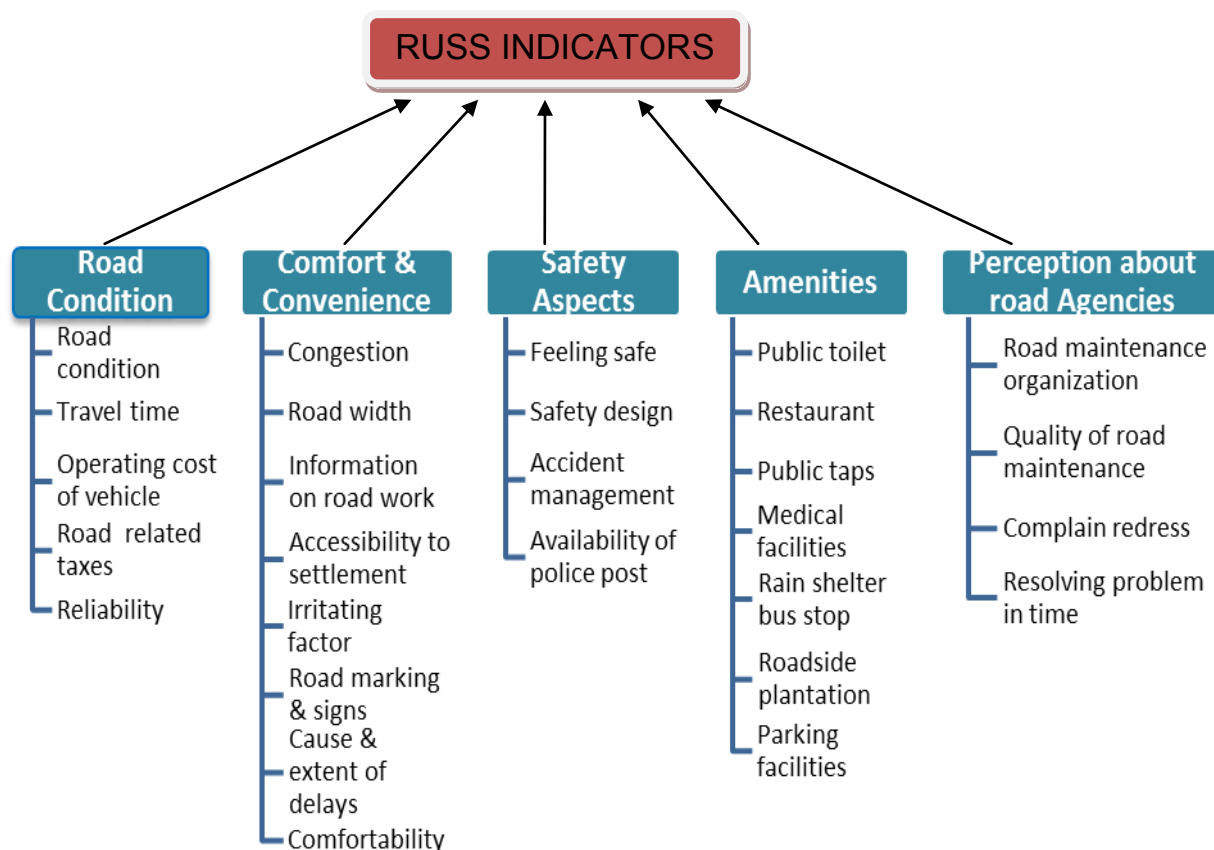


From Fig. 9.5, it is clear that the majority of respondents' satisfaction level is on average, i.e. nearly 39 percent were 'neither satisfied nor dissatisfied' and 27 percent above average i.e. 'somewhat satisfied' and 10 percent 'highly satisfied'. On the other hand, nearly 24 percent were below average i.e. either somewhat dissatisfied or highly dissatisfied.

10. OVERALL SATISFACTION

10.1 Analysis of Satisfaction Level

As discussed in chapter II, five major indicators with different sub indicators have been identified. In order to elicit the attributes or perceptions, road users have been categorized as; main users comprising 1497 numbers, vulnerable users comprising 1106 numbers and other road related associations/institutions constituting 250 numbers. They were interviewed in order to determine the overall satisfaction by means of five various indicators using 27 sub-indicators (variables) as shown in the following figure:



Ratings for users' responses to each sub-indicator have been made on a point scale depending upon the number of options provided to each question, which expressed in percentage represent the users' satisfaction level on attributes to each variable.

10.2 Overall Satisfaction

Based upon the above scoring system, scores for each of sub-indicators has been calculated from responses received from the road users and a total score for each indicator is achieved from respective sub-indicators. Final score represented in percentage gives the users' overall satisfaction level on different indicators which is shown in Table 10.2:

Table 10.1 Overall Satisfaction Level

Indicator	Satisfaction Level (%)
Road Condition and its perceived impact	54
Comfort and Convenience	53
Safety	51
Travel Amenities	40
Perception about Road Agencies	50

From table 10.2, it is found that the satisfaction level of road users is 54 percent on road condition and its perceived impact, 53 percent on comfort and convenience aspect, 40 percent on travel amenities and 50 percent on perception about road agencies. These figures show the travel amenities aspect is least cared by the concerned authorities. Present research on RUSS-II shows that overall road condition and its perceived impact, comfort and convenience, safety aspects and perception about road agencies are relatively satisfactory.

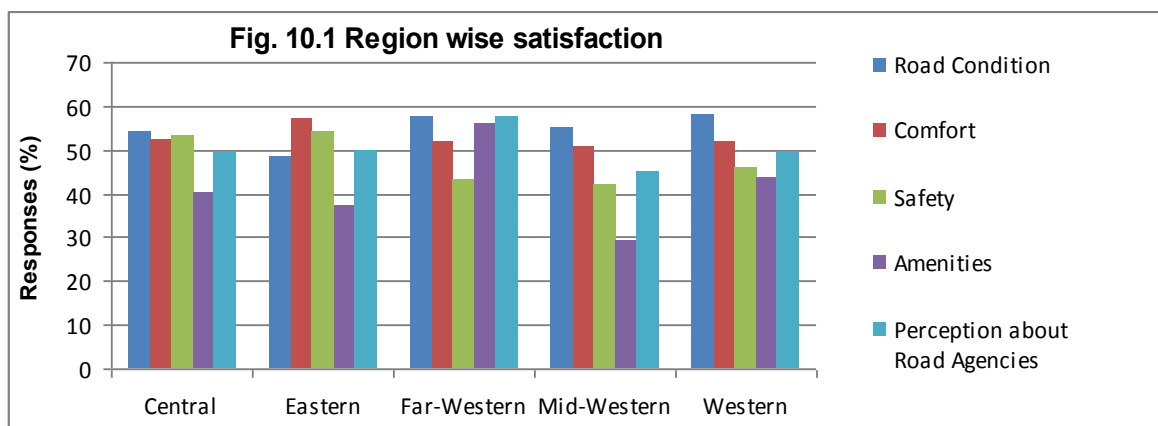
Overall satisfaction level of road users is distributed region, road category, terrain type and service center wise in the following sections:

10.3 Region Wise distribution

Region wise distribution of satisfaction is given in Table 10.3 and presented in chart form in Fig 10.1.

Table 10.2 Region Wise Distribution of Satisfaction (All figures are in percentage)

Region	Road Condition	Comfort and convenience	Safety	Travel Amenity	Perception about Road Agencies
Central	54.5	52.6	53.3	40.4	49.5
Eastern	48.7	57.4	54.3	37.4	49.9
Western	58.1	52.0	46.0	43.6	49.2
Mid-Western	55.0	50.7	42.1	29.3	44.9
Far-Western	57.9	52.1	43.5	55.9	57.7



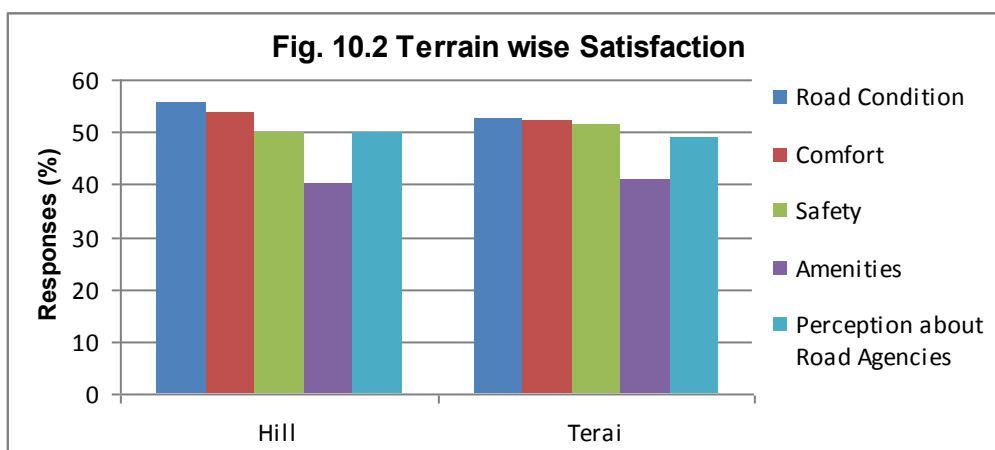
With reference to Fig. 10.1, the users' perception on road condition in western region is relatively higher, whereas both comfort and convenience, and safety aspects are relatively higher in eastern region. Similarly the travel amenities and perception about road agencies are higher in far western region.

10.4 Terrain type wise distribution

Terrain type wise distribution of satisfaction level of road users is shown in Table 10.4.

Table 10.3 Terrain Type Wise Distribution of Satisfaction (All figures are in percentage)

Region	Road Condition	Comfort and convenience	Safety	Travel Amenity	Perception about Road Agencies
Hill	55.7	54	50.0	40.3	50
Terai	52.6	52.2	51.6	40.8	49



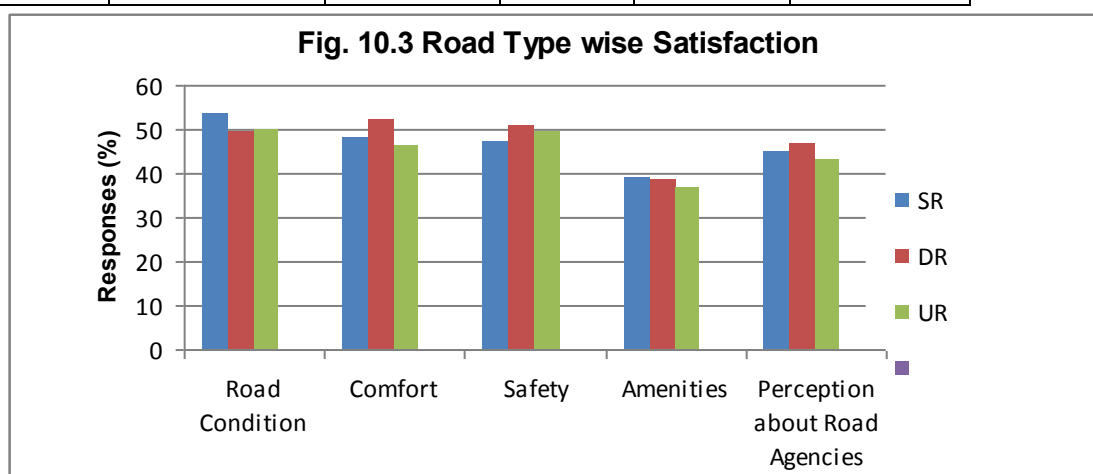
The outcome of survey resulted from the interview of road users, shows that the satisfaction level of each aspect of roads are found more or less the same in the range of 40 to 55 percent in hill and terai terrain.

10.5 Road Type Wise distribution

Table 10.5 shows the satisfaction level of road users for different categories of roads. The survey result shows that the satisfaction level of road condition and its perceived impact, and travel amenities in strategic roads are better than district and urban roads, whereas the satisfaction levels of comfort and convenience, safety and perception about road agencies are relatively higher in district roads.

Table 10.4 Road Type Wise Satisfaction Level (All figures are in percentage)

Road Type	Road Condition	Comfort and convenience	Safety	Travel Amenity	Perception about Road Agencies
SR	53.7	48.4	47.4	39.1	44.9
DR	49.7	52.1	50.8	38.5	47.0
UR	50.2	46.2	49.6	36.7	43.1



10.6 Service Centre Wise

The satisfaction level of respondents at different service center is shown in Table 10.6. The satisfaction level of road condition and its perceived impact, comfort and convenience aspects were found comparatively better in Manohara Bridge service center (Koteshwor-Suryabinayak Road). From the safety point of view, Battisputali service center is found to be better than others. Similarly the satisfaction level of travel amenity aspect is found relatively higher in Harisiddhi service center.

Table 10.5 Overall satisfactions on Service Center Wise (All figures are in percentage)

Road Types	Road Condition	Comfort and convenience	Safety	Travel Amenity	Perception about Road Agencies
Kakarbhitta (West)	61.9	69.4	57.8	49.5	65.9
Lahan (West)	69.2	70.4	56.7	47.9	69.7
Biratnagar	41.3	37.6	52.9	35.4	30.2
Rajbiraj (Jamuni)	26.9	42.1	46.6	26.4	21.4
Mirchaiya	32.7	44.1	44.8	27.4	26.0
Bhardaha (south)	33.8	36.4	60.7	30.0	29.8
Mirchaiya (north)	28.6	34.2	46.1	26.3	31.5
Fickle (east)	55.2	69.7	55.7	36.2	54.4
Dhankuta (south)	60.7	75.3	52.9	26.4	66.1
Hile (West)	31.7	41.0	49.3	27.2	34.4
Chandranigahapur	58.1	62.6	60.2	43.1	50.1
Simara	59.5	58.2	54.2	40.7	50.4
Ramnagar	56.1	49.1	51.6	39.7	52.2
Bharatpur	62.9	64.3	45.6	39.2	55.1
Birgunj	44.9	37.4	52.9	33.6	37.3
Dry Port, Sirsiya	41.0	36.1	53.6	28.1	36.0
Janakpur	28.0	27.4	49.7	23.1	31.4
Jaleswore	33.3	37.5	46.6	23.1	34.3
Dhalkebar (west)	50.9	53.4	62.2	45.2	49.3
Hetauda (West)	56.1	51.8	53.3	53.2	46.8
Thankot	57.3	46.4	52.8	49.0	49.5
Mugling (east)	64.1	62.2	57.2	39.8	58.0
Manohara Bridge	77.3	78.9	61.2	50.7	73.7
Harisiddhi	48.4	47.6	42.0	53.7	48.7
Jorpati (North)	45.5	36.6	41.7	42.2	36.0
Lamidanda	42.2	43.9	47.9	45.1	45.7
Battisputali	45.9	45.0	65.3	34.7	41.7
Mangal Bazaar	52.3	43.8	40.7	39.4	48.1
Hetauda (North)	62.6	65.2	51.1	30.5	58.2
Deurali (Trishuli)	51.3	42.3	48.0	41.3	38.7
Taudaha	42.2	35.1	52.0	29.9	38.6
Galchhi (North)	68.7	63.5	54.8	28.8	51.0
Butwal (South)	64.5	47.9	42.5	48.7	53.4
Taulihawa	61.7	50.1	39.6	42.4	49.0
Lekhnath	47.4	44.5	50.9	48.9	39.8
Pokhara	49.5	45.3	42.4	47.6	41.6
Abukhaireni (North)	58.1	64.6	53.1	39.5	52.9
Aryabhanjyang (East)	53.3	41.8	40.1	26.3	43.0
Tansen (West)	58.0	54.4	48.0	29.1	56.2
Pokhara (North)	64.9	67.2	47.7	51.6	52.1
Nepalgunj	52.4	50.0	42.9	26.3	42.9
Ghorahi (West)	60.9	57.1	45.3	35.0	53.0

Road Types	Road Condition	Comfort and convenience	Safety	Travel Amenity	Perception about Road Agencies
Baghaudda	46.4	43.9	30.7	23.1	27.2
Surkhet (South)	51.1	44.2	47.1	32.6	46.3
Lamahi (South)	57.5	48.0	37.1	26.7	37.2
Chhinchu (East)	60.8	59.3	41.0	25.0	52.7
Attariya (East)	57.3	53.1	45.3	60.5	55.0
Syaule (South)	59.6	52.1	40.6	58.8	66.6
Dadeldhura (North)(45.9	45.7	35.1	46.6	41.5
Dungrai (Dadeldhura)	66.7	52.8	49.6	55.2	56.8

10.7 Multiple Linear Regression Analysis

In order to determine the Road Users' Satisfaction Index (RUSI), multiple linear regression analysis with 'Overall satisfaction' as dependent variable and five major indicators discussed above as independent variables has been carried out. The regression model as determined from the analysis is given as:

$$\text{Overall Satisfaction} = 0.21 \times \text{Road Condition \& Perceived Impact} + 0.26 \times \text{Comfort \& Convenience} + 0.11 \times \text{Safety} + 0.28 \times \text{Travel Amenities} + 0.13 \times \text{Perception about Road Agency} + 0.20 (\pm 0.25)$$

Sample size: 2603

The figure multiplied to each indicator represents the coefficient of each variable of the linear regression equation and the error factor at 95 % confidence level is ± 0.25 .

The output of the multiple regression analysis essentially provides the regression equation to predict the dependent variable given the values of independent variables. In the above case, overall satisfaction is the dependent variable and the other five major indicators; road condition and its perceived impact, comfort and convenience, safety, travel amenities and perception about road agency are independent variables. The curve represented by the above equation is a straight line that best fits the observed values of the independent variables and the constant figure 0.20 is the intercept by the straight line on the ordinate i.e. on dependent variable axis.

The coefficient to each independent variable of the linear equation signifies the degree of its contribution towards the change in overall satisfaction. That means the contribution of independent variable on Overall Satisfaction will be 21% of the perception in road condition & perceived impact, 27% of the perception in comfort & convenience, 11% of the perception in safety aspects, 28% of the perception in travel amenities and 13% of the perception about road agency. The significance of the intercept (+.20 in the present analysis) is that even if the values for all the independent variables tend to zero, there is still some satisfaction amongst the road users due to only the presence of road. Present analysis shows in the attributes of road users that travel amenities and comfort and convenience have the highest, and the safety aspect the least contribution towards overall satisfaction

10.8 Road Users' Satisfaction Index (RUSI)

Road users' satisfaction indices have been prepared on the basis of '1' to '5' points rating scale, significant rating of each point being as given in the following table:

Point	Satisfaction Rating
5	Highly satisfactory
4	Satisfactory
3	Somewhat satisfactory
2	Dissatisfactory
1	Highly dissatisfactory

The results are separately presented for different types of roads, hilly/rolling and terai terrain, five development regions and 50 service centers in the following sub-sections:

10.8.1 RUSI – Road Category Wise

The RUS Index score for different categories of roads, as presented in Table 10.6 shows that the overall rating for strategic roads (RUSI: 2.49) is slightly towards dissatisfaction. Individual satisfaction for each major indicator (Table 10.4) shows the most lacking aspect is the perception about travel amenities especially parking facilities, public toilets, public water taps, rain shelter/bus stops workshop/mechanics etc. Responsible road agency for SR, mainly the DOR, is therefore required to give more attention on these aspects so as to increase the level of satisfaction. RUS Index for district roads is towards satisfaction, whereas in urban roads, it is dissatisfactory. Responsible agency, mainly the municipalities have to pay more attention for improvement of urban roads.

The index score separately presented for motorized and non-motorized users (Table 10.6) shows the satisfaction level of motorized users is highest in strategic roads, second highest in urban roads and least in district roads whereas in non-motorized users' rating, it is found highest in DR, second highest in UR and the least in SR. The high rating by non-motorized users in DR is primarily due to the availability of easy access to rural areas where they can easily commute to and from their homes, transport goods, and have access to market places. It may also be due to very little concerns for local users regarding the operation and maintenance cost, whereas for motorized users it is of major concern. However, the analysis shows that the difference in index scores is not as high as one could have expected. The gap between road users' expectations and their experience plays a major role in determining satisfaction index scores. That is why DR and UR have shown better in terms of index scores than SR whose conditions are otherwise better.

Table 10.6 RUS Index for different Categories of Roads (Figures are in Index score)

S. No.	Road type	RUS Index (Motorized users)	RUS Index (Non-motorized users)	Overall RUS Index
1	SR	2.86	2.23	2.49
2	DR	2.30	2.70	2.52
3	UR	2.60	2.25	2.39

Motorized users sample size: 1497; Non-motorized users sample size: 1106

10.8.2 RUSI – Region Wise

From the result of users' satisfaction analysis, maximum overall index score has been achieved for far-western region and the least one for mid-western region. The overall indices for other three regions were found to slightly differing. The reason is probably the relatively recent development of newly constructed road network in far-western region where the road conditions are relatively better and the users availed unexpectedly a new road service delivery. However the in depth analysis shows a better perception on travel amenities and perception about road agencies in far-western region, comfort and convenience; and safety aspects in eastern region and improved road condition in western region.

Table 10.7 RUS Index for five Development Regions (Figures are in Index score)

S. No.	Region	RUS Index
1	Far-Western	2.88
2	Western	2.67
3	Central	2.64
4	Eastern	2.60
5	Mid-Western	2.37


 RUS-Index in decreasing order

10.8.3 RUSI – Terrain Type Wise

The RUS index in hill/rolling terrain is slightly higher than that in Terai. However the in depth analysis shows the safety and travel amenities aspects in Terai region were found higher rating by the road users.

Table 10.8 RUS Index for Hill/Rolling and Terai (Figures are in Index score)

S. No.	Terrain Type	RUS Index
1	Hill/Rolling terrain	2.65
2	Terai	2.60

10.8.4 RUSI – Service Centre Wise

Road users' satisfaction indices at different service centers studied are presented separately in table 10.10. As one would expect the overall satisfaction level at Manohara Bridge service center in Bhaktapur (Koteshwor – Suryabinayak road) is found to be the highest whereas it is lowest at Janakpur. Unlike in region-wise, road type and terrain type wise RUS Index, there is comparatively bigger gap between the highest and lowest level of users' satisfaction which indicates road specific attributes of the road users. Better roads have certainly the better perceptions to users. Service centers near well maintained roads have better rating towards users' perception.

However the in depth analysis shows the users' attributes on different outcome count differently at various service centers. Users' satisfaction level on road condition and its perceived impact is highest at Kakarbhitta and lowest at Dandeldhura service center. Users' satisfaction level on comfort and convenience is again highest at Kakarbhitta and lowest at Taudaha service center. Safety aspect is found best at Simara and worst in Harisiddhi, Similarly the satisfaction level on travel amenities is found highest at Harisiddhi and lowest in Nepalgunj whereas the users at Lahan have better perception about road agencies and lowest at Baghauda service center.

Service center wise RUS indices at different types of roads surveyed shows that 23% of strategic roads (7 out of 31 roads), 83% of district roads (10 out of 12 roads) and 86% of urban roads (6 out of 7 roads) surveyed have the RUS indices below average i.e. towards dissatisfactory ratings. These figures on road users' perception indicate that the responsible road agencies have to give more attention especially district roads mostly by District Development Committee's and urban roads mostly by Municipalities.

Table 10.9 RUS Index for Different Service Centers

(Figures are in Index score)

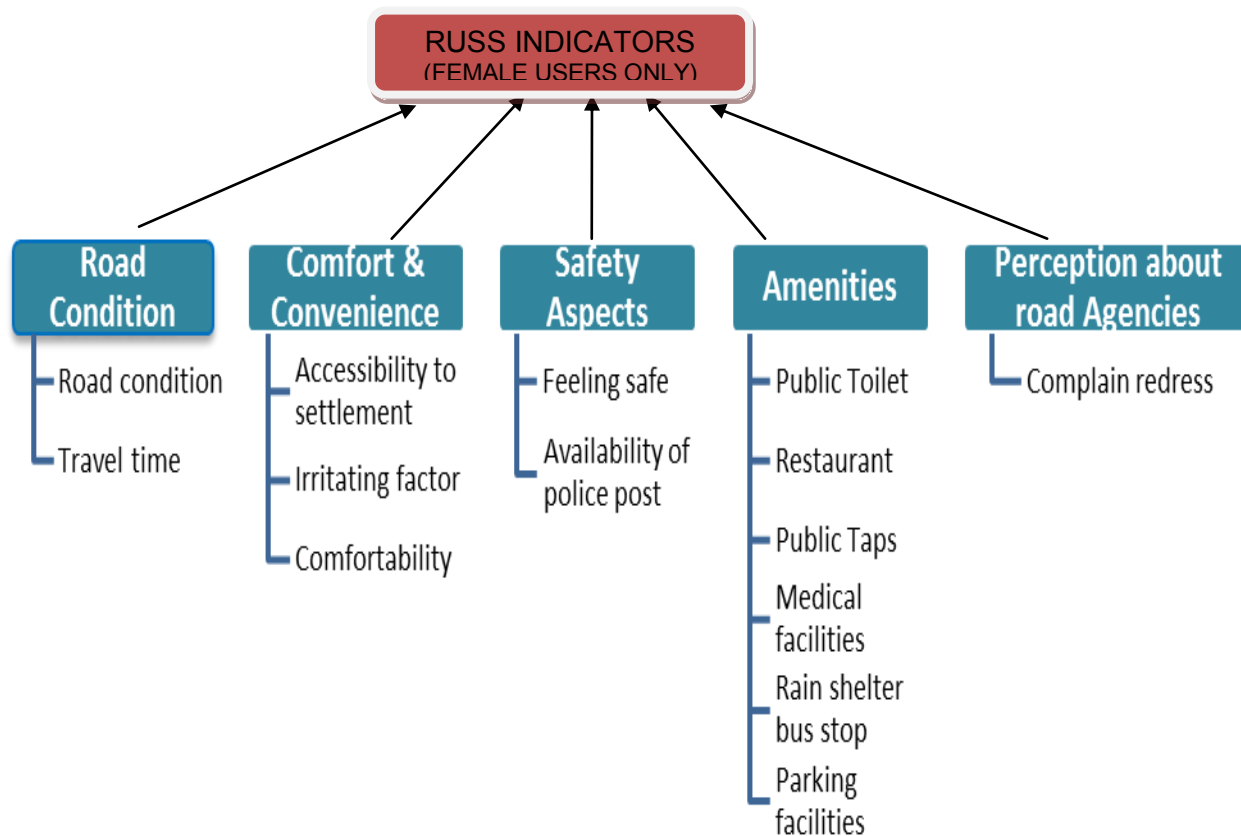
S.No.	Service Center	Road Link	RUS Index
1	Manohara Bridge	ARM (Manohara Bridge-Gatthaghar), SR	3.56
2	Lahan (West)	MRM (Lahan-Mirchaiya), SR	3.28
3	Kakarbhitta (West)	MRM (Kakarbhitta-Birtamode), SR	3.19
4	Pokhara (North)	Pokhara – Baglung at Yamdi Bridge, SR	3.08
5	Dungrai (Dadeldhura)	Dadheldhura-Bagakot, DR	3.00
6	Syaule (South)	Attariya – Syaule, SR	2.98
7	Attariya (East)	MRM (Attariya-Junga), SR	2.95
8	Mugling (east)	PRM (Mugling-Malekhu), SR	2.93
9	Dhankutta (south)	KRM (Dhankuta Bhedetar), SR	2.91
10	Chandranigapur	MRM (Pathalaiya-Chandranigahapur), SR	2.89
11	Bharatpur	Bharatpur City Roads, UR	2.85
12	Fikkal (east)	Fikkal – Pahupati Nagar, SR	2.85
13	Abukhaireni (North)	Abukhaireni-Gorkha, SR	2.84
14	Hetauda (West)	MRM (Hetauda-Narayanghat), SR	2.81
15	Hetauda (North)	Samari Bridge (Hetauda-Bhainse), SR	2.79
16	Galchhi (North)	Galchhi - Trishuli Road, SR	2.78
17	Simara	TRP (Pathaliya-Birgunj), SR	2.78
18	Butwal (South)	SRM (Butwal-Bhairahawa), SR	2.76
19	Dhalkebar (west)	Ratubridge Dhalkebar – Nawalpur, SR	2.72
20	Thankot	TRP (Naubise-Kalimati), SR	2.70
21	Ghorahi (West)	Ghorahi- Tulsipur, SR	2.66
22	Taulihawa	MRM Highway-Taulihawa, DR	2.63
23	Harisiddhi	Satdabato-Harisiddhi, SR	2.63
24	Ramnagar	MRM (Narayanghat North), SR	2.61
25	Tansen (West)	Tansen-Ridhi-Tamghas, SR	2.55
26	Chhinchu (East)	Chhinchu – Jajarkot, SR	2.53
27	Lekhnath	PRM (Pokhara-Kotre), SR	2.50
28	Pokhara	Pokhara City Road, UR	2.48
29	Mangal Bazar	Lalitpur: Pulchowk-Mangal Bazar, UR	2.41
30	Lamidanda	Pachkhal–Melamchi Road, SR	2.40
31	Dadeldhura (North)	MKRM (Dadeldhura – Khodpe), SR	2.39
32	Deurali (Trishuli)	Trishuli-Deurali, DR	2.38
33	Battisputali	Kathmandu City Road, UR	2.38
34	Surkhet (South)	RRM (Surkhet-Chhinchu), SR	2.33
35	Nepalgunj	Nepalgunj City Road, UR	2.28
36	Lamahi (South)	Lamahi – koilabas, DR	2.25
37	Jorpati (North)	Jorpati-Sundarijal, SR	2.21
38	Aryabhanjyang (East)	Aryabhanjyang –Rampur, DR	2.17
39	Birgunj	Birgunj City Roads, UR	2.16
40	Biratnagar	Biratnagar Municipal Roads, UR	2.10
41	Taudaha	Chobhar-Dakshinkali Road, SR	2.06
42	Dry Port, Sirsiya	Birgunj Thori, DR	2.02
43	Bhardaha (south)	MRM Bhardaha Rotary Towards Hanumannagar-Rajbiraj Road, SR	1.98
44	Hile (West)	Hile – Bhojpur, DR	1.94
45	Baghaudda	Nepalgung – Baghaudda, DR	1.93
46	Mirchaiya	Lahan – Bhagwanpur, DR	1.91
47	Jaleshwore	Jaleshwore – Matihani, DR	1.84
48	Rajbiraj (Jamuni)	Rajbiraj – Balan, DR	1.79
49	Mirchaiaya (north)	Mirchaiya – Katari Road, SR	1.77
50	Janakpur	Janakpur – Manaharpur, DR	1.65

RUS-Index in decreasing order

10.9 Female Road Users' Satisfaction

In the present research study, there were 316 females (+12%) out of 2603 total sample size. Out of 316 respondents 27 were the motorized users including drivers, whereas the rest 289 were the non-motorized users. Satisfaction level of Female road users has been assessed on the basis of responses from female road users only.

As discussed above five major indicators followed by respective sub-indicators have been used in order to assess the overall satisfaction. However in assessing the female satisfaction, responses on those sub-indicators which are most relevant to females only are used as shown in the following figure:



Summary of overall satisfaction level of female respondents is presented in the following Table 10.10:

Table 10.10 Satisfaction Level of Female Road Users (All figures are in percentage)

Indicator	Sub-Indicator	Perceived Satisfaction Level
Road Condition and its perceived impact	Road condition	59
	Travel time	58
Comfort and Convenience	Accessibility to settlements	72
	Irritating factors	72*
	Comfortability	64
Safety	Feeling safe	13
	Availability of police post	99
Travel Amenities	Public toilet	11
	Restaurants	89
	Public taps	10
	Medical facilities	70
	Rain shelter/ Bus stop	1
	Parking facilities	5
Perception about Road Agencies	Complaint redress	75

From the study of the above table, it is clear that the female attribute on road condition and its perceived impact including its sub-indicators is above average i.e. somewhat satisfactory.

In comfort and convenience aspects, accessibility to settlements due to the presence of roads is quite satisfactory. Similarly the comfortability as a whole is also towards satisfactory level.

Irritating factor is negative driver. Percentage response to this indicator is also quite high which indicates a lot of irritation due to various factors mainly the road side parking, narrow road, over speed, reckless overtaking, aggressive driving etc.

In safety aspects, overall safety feeling is almost highly dissatisfactory. On the other hand, availability of police post is highly satisfactory. Therefore, it is urgently required to address the issues for increasing safety feeling of female road users.

In travel amenity aspects, availability of restaurants i.e. food/drinks etc. is highly satisfactory and similarly a slightly lesser attribute on availability of medical facilities. But the perception on other indicators namely public toilets and drinking water taps, rain shelter/bus stop and parking facilities etc. are highly dissatisfactory to female road users. Responsible road agency is therefore, required to properly address such issues during the construction of road itself and/or during upgrading/ rehabilitation stage.

In female respondents' perception, the complaint redressal practices of various road agencies have been found satisfactory.

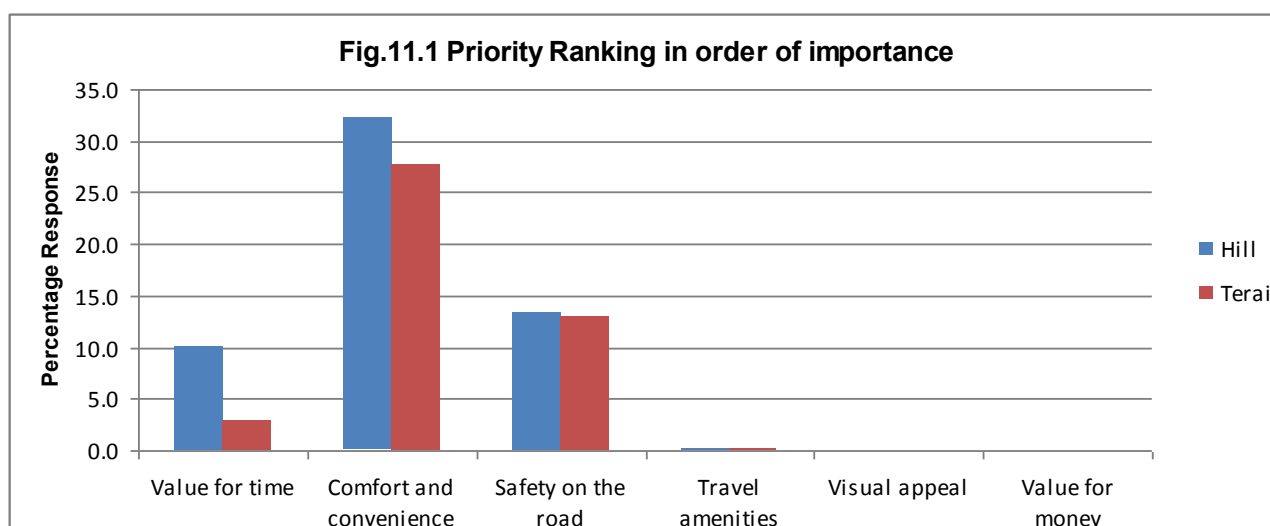
11. PRIORITY FOR IMPROVEMENT

11.1 Priority for Improvement for Better Road Services

Construction and maintenance of safe, reliable and comfortable roads in rugged terrain of Nepal is a challenging task. In these regards, the research work has been focused to elicit the attributes of different road users on priorities for improvements on better road services to be delivered by road agencies. Various factors considered were, value for time, comfort and convenience, safety, travel amenities, visual appeal and value for money. Various respondents were asked to rank them in order of their importance while commuting on roads in Nepal. Ranks have been assigned from 1 to 6, where '1' being the most important, '2' for important and so on. Percentage response on ranking by the road users is shown in Table 11.1 and presented graphically in Fig. 11.1.

Table 11.1 Priorities for Better Road Services

Factor	Response				Total (%)	Rank
	Hill		Terai			
	Nos	%	Nos	%		
Comfort and convenience	839	32.3	720	27.7	60.0	1
Safety on the road	349	13.4	339	13.0	26.4	2
Value for time	262	10.1	76	2.9	13.0	3
Travel amenities	7	0.3	3	0.1	0.4	4
Value for money	2	0.1	4	0.2	0.2	5
Visual appeal	1	0.0	1	0.0	0.1	6
Total	1460	56	1143	44	100	



Majority of road users (60 %) have given the first priority to “**comfort and convenience**” while traveling or driving on roads. The major concern of road agencies should thus be focused on improvement of comfort and convenience aspect of road users. The second priority has been given to “**safety on road**” and then to “**value for time**” whereas the priorities given to other factors, “**travel amenities**”, “**visual appeal**” and “**value for money**” were insignificant.

11.2 Priorities for Better Road Management

As in section 11.1, research work has been focused to elicit the attributes of different road users on priorities for improvements on better road management by road agencies in terms of maintenance and additional facilities. Various factors considered were, construction of wider roads and widening

of existing one, improvement of curves, provision of additional road side facilities, enforcement of traffic rules and provision/installation of informatory/warning signs. Various respondents were asked to rank them in order of their importance while commuting on roads in Nepal. Ranks have been assigned from 1 to 6, where '1' being the most important then '2' and so on. Percentage response on ranking by the road users in Hilly and Terai roads is shown in Table 11.2 and presented in Fig. 11.2.

Table 11.2 Priorities for Better Road Management

Priorities for better road management	Response				Total (%)	Rank
	Hill		Terai			
	Nos	%	Nos	%		
Widen existing roads	663	25.5	493	18.9	44.4	1
Informatory/Warning Signs	216	8.3	251	9.6	17.9	2
Make significant road width	268	10.3	127	4.9	15.2	3
More road side facilities	108	4.1	169	6.5	10.6	4
Tougher road traffic rules enforcement	152	5.8	80	3.1	8.9	5
Widening/improvement of curves	54	2.1	22	0.8	2.9	6
Total	1461	56.1	1142	43.9	100	

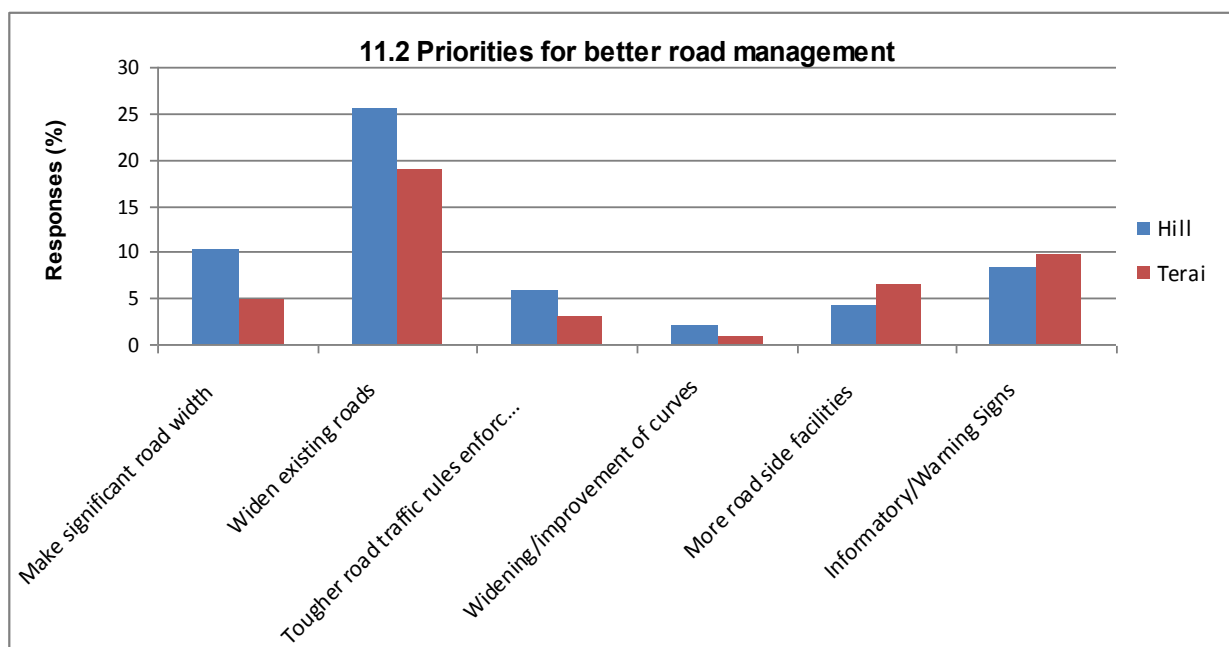


Figure 11.2 shows the road user's perception for better road management of various roads both in Hill and Terai regions.

Majority of road users (nearly 45 %) have given the first priority for widening of existing roads and second priority to provision of informatory/warning signs. Third priority is given to the construction of significantly wider roads whereas the priority ranking for provision of more road side facilities, enforcement of tougher traffic rules and widening/improvement of curves were ranked as 4th, 5th and 6th priorities respectively.

12. COMPARISON BETWEEN RUSS-I & RUSS-II

The first Road Users' Satisfaction Survey-I (RUSS-I) in Nepal was undertaken in 2006 whereas the present survey has been conducted in 2012/13. That means there is a gap of 6 years between the two consecutive surveys.

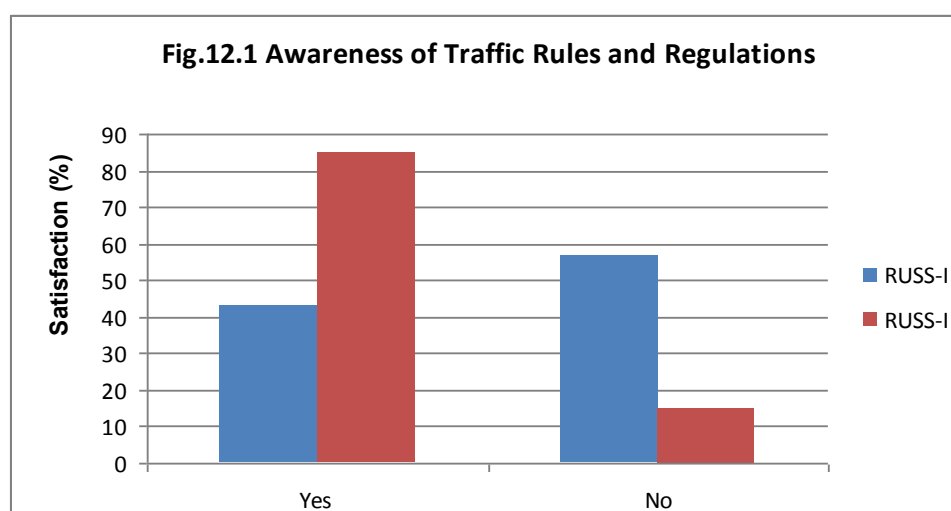
In this chapter, comparison between selected key variables which were common in both RUSS-I and RUSS-II has been presented.

12.1 Awareness of traffic rules and regulations

A comparison between the two surveys is shown in Fig. 12.1. From this figure it is obvious that the awareness of traffic rules and regulations among the road users has substantially increased from RUSS-I to RUSS-II. Road users are found to be more aware of traffic rules and regulations in RUSS-II.

Table 12.1 Awareness of traffic rules (All figures are in %)

Traffic Awareness	RUSS-I	RUSS-II
Yes	43	85
No	57	15

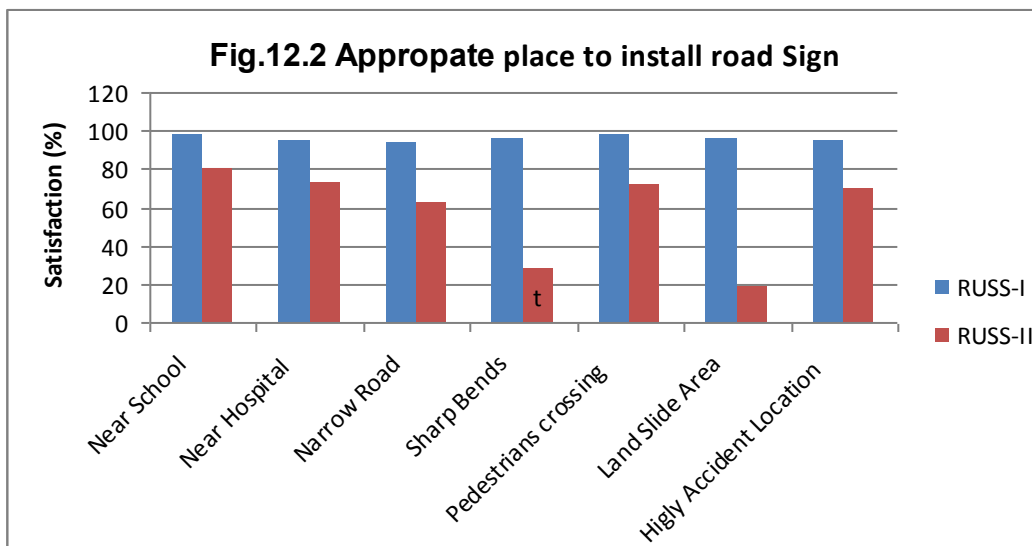


12.2 Appropriate place for installing road sign

Outcome of the comparative response is shown in Fig. 12.2, which shows that the road signs have already been installed at most of the appropriate places since the time RUSS-I has been conducted.

Table 12.2 Appropriate place to install road signs

Appropriate Road Sign	RUSS-I	RUSS-II
Near School	98	80
Near Hospital	95	73
Narrow Road	94	63
Sharp Bends	96	28
Pedestrians crossing	98	72
Land Slide Area	96	19
Highly accident Location	95	70

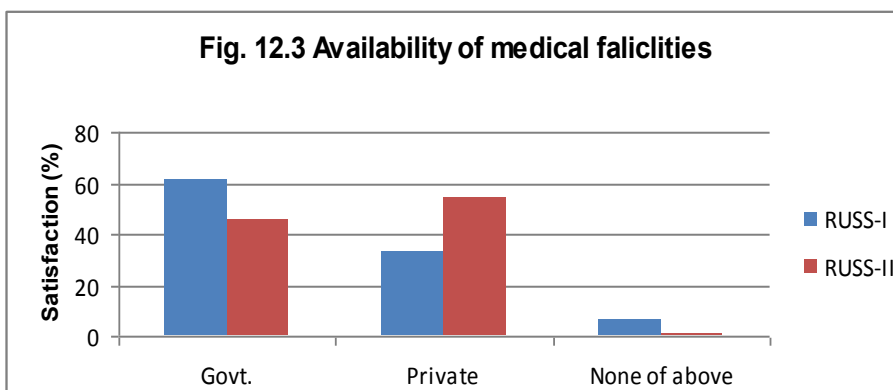


12.3 Medical Facilities

Table 12.3 shows the availability of medical facilities in RUSS-I & RUSS-II. The outcome shows the private hospital (mainly clinic) has increased along all roads sections, whereas the government hospital remained the same.

Table 12.3 Availability of Medical Facilities

Medical Facilities	RUSS-I	RUSS-II
Government hospital	61	45
Private hospital (mainly clinic)	33	54
None of above	6	1

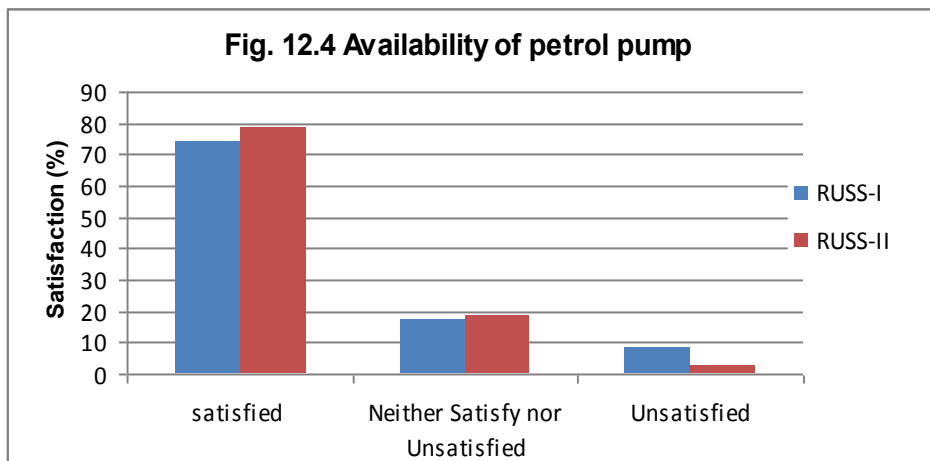


12.4 Availability of Petrol Pumps

There is considerable increase in satisfaction level on availability of petrol pumps in RUSS-II. Majority (79%) of the users are satisfied with availability of fuel stations, whereas only 2 percent of users are dissatisfied. Fig. 12.4 shows the comparison of satisfaction level on availability of petrol pumps in RUSS-I and RUSS- II.

Table 12.4 Availability of Petrol Pumps

Petrol Pump	RUSS-I	RUSS-II
Satisfied	74	79
Neither Satisfy nor dissatisfied	17	19
Dissatisfied	8	2

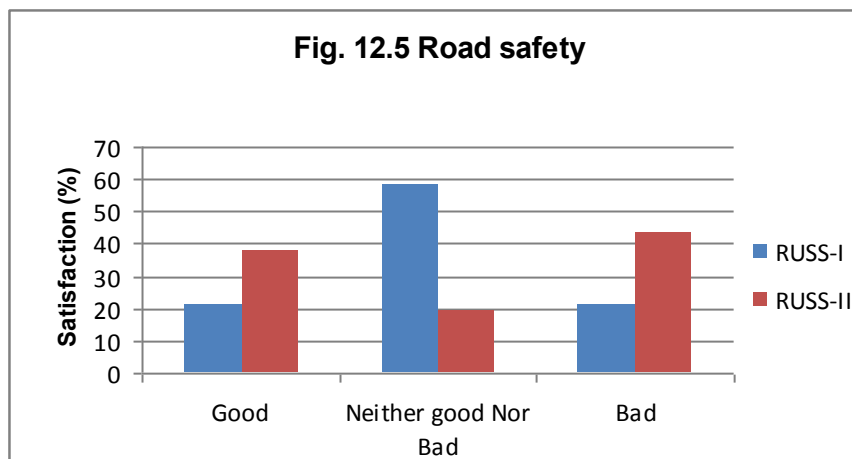


12.5 Road Safety

The outcome of the result shows that the satisfaction level of road users on safety aspect has increased in RUSS-II, but at the same, a significant numbers of road users (43 %) regard it as decreasing too, which may be mainly due to the rapid expansion of unpaved seasonal local roads network. Furthermore the road users are gradually becoming more conscious about road safety aspects as the intermediate response such as 'neither good nor bad' has been significantly decreased from 58 % to 19 % in RUSS-II. Fig. 12.5 shows the comparative satisfaction level of road safety in RUSS-I & RUSS-II.

Table 12.5 Road Safety

Safety	RUSS-I	RUSS-II
Good	21	38
Neither good Nor Bad	58	19
Bad	21	43

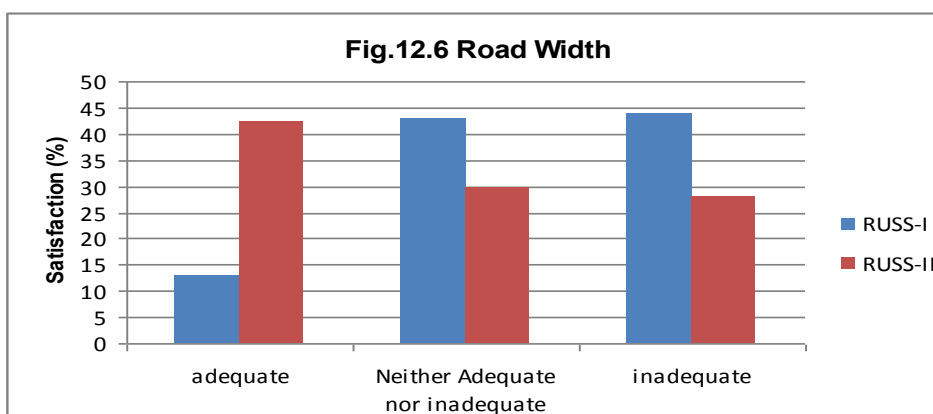


12.6 Road Width

Comparative table-12.6 shows the satisfaction level on adequacy of road width has increased in RUSS-II since RUSS-I. Comparatively district and urban roads width is somewhat inadequate as compared to that of strategic roads.

Table 12.6 Road width

Road Width	RUSS-I	RUSS-II
Adequate	13	42
Neither Adequate nor inadequate	43	30
Inadequate	44	28

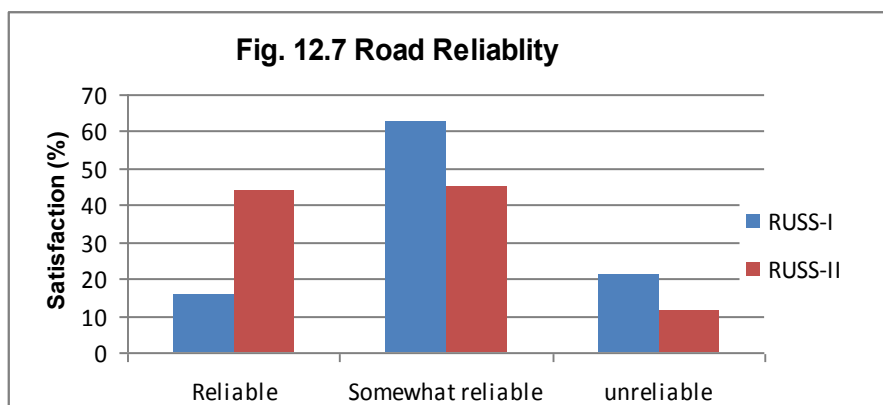


12.7 Road Reliability

Comparison of survey result as given in Fig. 12.7 shows that the road users are more satisfied with road reliability in RUSS-II than RUSS-I.

Table 12.7 Road Reliability

Road reliability	RUSS-I	RUSS-II
Reliable	16	44
Somewhat reliable	63	45
Unreliable	21	11

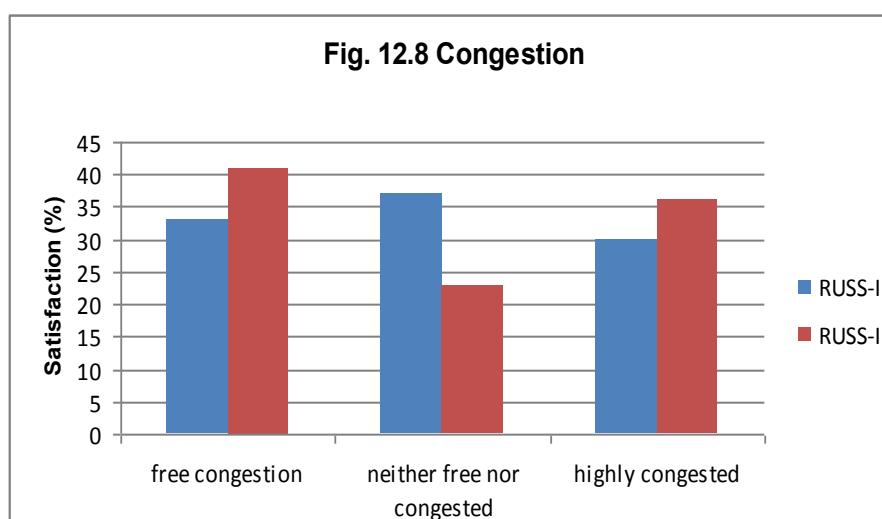


12.8 Road Congestion

Table-12.8 and Fig. 12.8 show the comparison of satisfaction level of road users on the issue of road congestion in RUSS-II and RUSS-I. Nearly 41 percent respondents in RUSS-II against 33 percent in RUSS-I said that the roads are free from congestion while on the other hand, 36 percent said 'highly congested'. Thus, we can say that the satisfaction level on the issue of road congestion in RUSS-II has slightly improved since RUSS-I, but at the same time it has also declined mainly because of urban traffic expansion.

Table 12.8 Road Congestion

Congestion	RUSS-I	RUSS-II
Free of congestion	33	41
Neither free nor congested	37	23
Highly congested	30	36

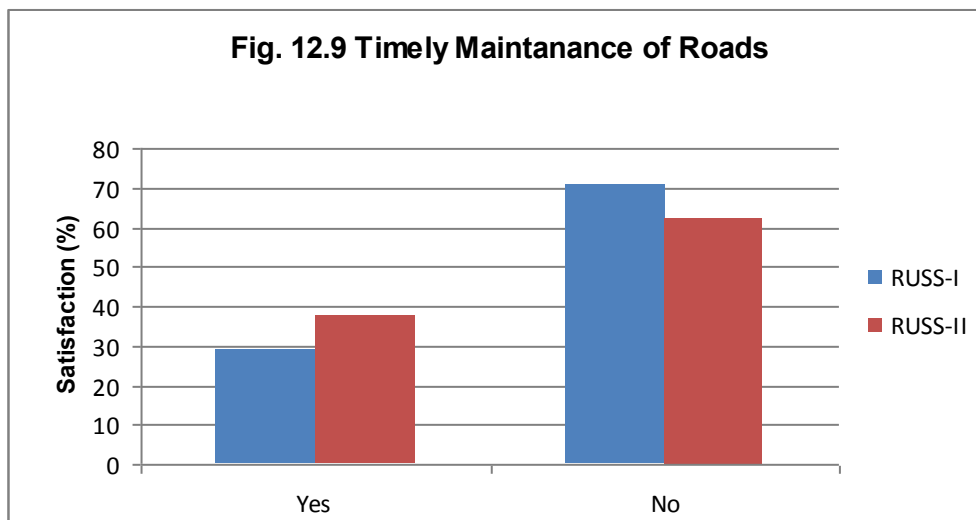


12.9 Timely Maintenance of Road

Table 12.9 and Fig. 12.9 show the comparison of percentage responses on timely maintenance of roads in RUSS-I and RUSS-II. The result shows a gradual increase of satisfaction level on the issue of road maintenance of all types of roads.

Table 12.9 Timely Maintenance of Road

Timely Maintenance	RUSS-I	RUSS-II
Yes	29	38
No	71	62

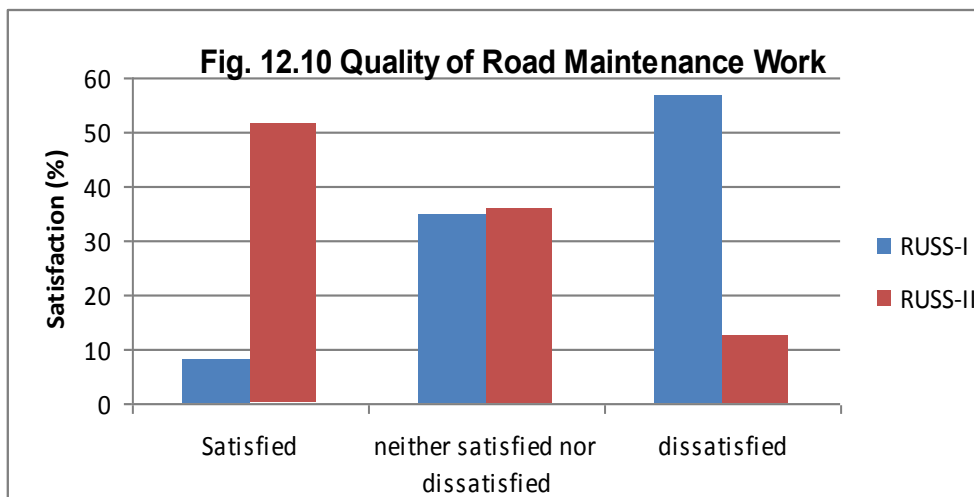


12.10 Quality of Road Maintenance

Table 12.10 and Fig. 12.10 show the comparison of quality of road maintenance work in RUSS-I and RUSS-II. The comparison shows that there is a significant improvement on the quality of road maintenance work in RUSS-II since RUSS-I.

Table-12.10 Quality of Road Maintenance

Quality of Maintenance	RUSS-I	RUSS-II
Satisfied	8	52
Neither satisfied nor dissatisfied	35	36
Dissatisfied	57	12



13. IEC MATERIALS

13.1 Preparation of IEC Materials

In order to effectively disseminate and increase the level of awareness and alertness to road-users for rational use of the roads by all users, the consultant has prepared standard tools for Information, Education and Communication (IEC) to road users elaborating all relevant aspects of users' satisfaction.

The IEC material contains information dissemination tools like flyers of pamphlets, calendars, leaflets, brochures, slogans etc. Local FM radio and local channels in Television are taken as the modest way for effectively disseminating necessary knowledge and information to all road-users and stakeholders. These activities will have to be carried out by various road agencies in close coordination with the stakeholders, local government, traffic police, department of transport management and other responsible organizations/ peoples as required.

The complete IEC material is divided into three sections:

The first section explains basic information about road, its types, maintenance strategies and concerned agencies of respective roads. It provides information to stakeholders about the different types of road, axel-load limit, road-maintenance modality of Roads Board Nepal and road maintenance provision. An overview of Roads Board Nepal is provided to increase public-awareness about RBN, its responsibility, duties, organizational structure and procedure, budgeting system, resource collection and mobilization.

The second section deals with educative material which will provide basic knowledge to the road users on rational use of the road. Basically it has given priority to prime stakeholder and concerned agencies for the use of road. It tries to educate through the respective right, responsibilities and obligations to the stakeholder. Mainly, priority and focus is given to the drivers, operators, construction entrepreneurs, pedestrians, government agencies and road neighbor to educate them through the educative materials.

The third section deals with the communicative materials. Communicative materials include a sample of public notice to increase awareness and rational use of the road, some effective slogans to share with co-workers and a concept of using Radio/FM for communicating the message.

It is very essential to conduct a detail survey and consultation of effectiveness of media and programme-design to be broadcasted by Roads Board Nepal. A detail working plan schedule and modality of Radio/ FM broadcasting is described. Radio/FM and TV are considered very effective medium of communication and comprises a large number of listeners. Radio/FM, its detail programme schedule, nature, cover-area, targeted group and rationality for the programme is mentioned in this section. It is suggested that before establishing its FM Station; Roads Board Nepal has to connect through national FM station negotiating certain peak time and broadcast programme with local FM stations. When Roads Board Nepal is able to establish its own FM station then it has to broadcast its own program in a full-fledged manner. It also has to raise public awareness through short-term advertisement in different popular electronic-media and television serials using popular actors and actresses. IEC Material is attached in Annex-V.

14. FUTURE POLICY AND OPERATIONAL PRIORITIES

While conducting the field survey there were queries raised by road users about various attributes affecting the satisfaction level of stakeholders. It was a challenging task that needed to be adopted by the concerned road agencies. There are certain inputs pertaining to various policy initiatives based on discussions with various stakeholders. These views will guide road agencies in streamlining their policies and operations according to its relevance to different aspects of users' satisfactions such as road maintenance, road safety, traffic management and private sector participation.

14.1 Road Maintenance Aspects

Timely procurement

Road users pointed out that the procurement of works should be accomplished well in time by adopting e-bidding process by road agencies and it should be transparent to all.

Implementation of works

Road users gave their views that the road maintenance and improvement works should be carried out regularly by maintaining the specified quality of works effectively in time bound manner. Regular and strict supervision by the Engineer during the implementation, and effective monitoring and evaluation by the higher authorities should be conducted regularly in order to ensure the quality of works. Their main concerns were to incorporate strong policy, which discourages corruption and encourages provision of reward and punishment to those who are involved in road works.

Wider and congestion-free roads with proper drainage system

Road users complained that road in district and urban roads are not wide enough for the traffic plying on these roads safely and comfortably, and this problem is further worsened on the event of heavy rainfall during monsoon season. Encroachments by local people living nearby the road aggravate this situation adding more to congestion level. Such problems can be overcome by providing wider road and proper drainage system.

Right-of-way

As road agencies are facing problems due to encroachment of right-of-way, road users suggested that it can be made free from encroachment with the help of local NGOs/local political leaders, local administration and police so as to ensure the possibility of further expansion of road width in future.

14.2 Road Safety Aspect

Awareness and Education Programs

There is a need to increase awareness about various aspects through a certain sustainable campaign such as raising road safety awareness programs on media/TV and including traffic education program in school curriculum. Participation of NGOs, schools, chambers of commerce, traffic police, media and other community-based organizations etc need to be encouraged in raising the awareness for the road traffic behavior. Safety awareness programs should be conducted for drivers and road users.

Enforcement of traffic rules and regulations

It is not enough to increase the awareness about safe road behavior; rather there is urgent need for effective enforcement of traffic rules and regulations with the help of traffic police. Complaints and grievances raised by road users are valid issues such as violating traffic regulations, reckless driving and crossing (pedestrian/livestock), alcohol-drunk drivers, over speed, liberal issue of license etc. which need to be taken care by enforcing traffic rules and regulations.

Road marking & traffic sign management, and physical Improvement

Most of the road users complained that road markings and traffic signs are mostly either at improper location or insufficient during night travel. Sufficient numbers of traffic signs are not placed at proper locations and strategic places such as sharp bends, blind curves, diversions and road works in progress etc. Road marking paints are not visible thereby making it more difficult to maintain lanes and estimate the road width. In order to avoid road accidents particularly during night travel, marking paints and sufficient traffic signs at proper locations need to be given proper attention especially on roads in hilly terrain. From the road safety point of view, improvement works such as widening of sharp and narrow roads need to be undertaken so as to meet the anticipated traffic volume, and provision of separate lane for pedestrian and non-motorized vehicles.

14.3 Traffic Management

Speed limits

In plain terrain, over-speeding on narrow roads and curves result to fatal accidents. Road users suggested that speed limits should be specified for segments of roads at key locations like schools, hospitals, densely populated and city areas.

Removal of old vehicles

Road users complained that the concerned road agencies need to reform their policies with regards to pollutions resulting from old vehicular emissions. They said very old vehicles should be banned from the urban areas and stressed for regular inspection of vehicles by concerned authority.

Road Amenities

Road agency cannot provide all road amenities on its own but can act as a facilitator. Amenities like restaurants, public toilets, parking places, drinking water taps, medical facilities, police posts etc. can be constructed adequately at appropriate locations by persuading the local NGOs, local community-based organizations.

Private-Sector Participation

Road users raised their concerns regarding private-sector participation in the maintenance and improvement of road works. A few road users advocated for private-sector management of road maintenance, assuring quality and cost-economy resulting from competitive bidding when compared with the present system the road agencies have been adopting.

15. CONCLUSION AND RECOMMENDATIONS

For Road Users' Satisfaction Survey-II, 1497 main road users, 1106 vulnerable road users and 247 other road users were interviewed on 50 different service centers covering 558 km of strategic roads, 530 km district roads and 162 km urban roads throughout the kingdom of Nepal. Survey findings are elaborately explained and presented in various sections supplemented with relevant Tables and Figures in the previous respective chapters.

Conclusion

Based on the findings and analysis, several conclusions have been drawn which are as follows:

1. Respondents' Profile:

- (a) Survey analysis shows that majority of respondents (86%) were literate with education level up to SLC and 10+2 and graduate and above, 5 percent; while 9 % were illiterate.
- (b) Nearly 24% of the respondents have access to read newspaper, 26% listen FM radio, 71% watch TV and only 0.3% use internet.
- (c) Many respondents (44%) earn in the range of NRs 5,000 to NRs 20,000, 44% earn above NRs. 20,000 per month and the rest less than NRs. 5,000.
- (d) Majority of respondents (75%) are aware of traffic rules and regulations and follow them strictly in SR but only 15% respondents in DR and 10% respondents in UR are aware of these rules. Traffic rules violators were found mostly rickshaw pullers and tempo drivers.
- (e) 64% of respondents interviewed were daily road users who used to travel for business/job/agricultural purposes.

2. Road Conditions and Perceived Impact:

- (a) Road condition in the last two years has improved satisfactorily as expressed by 59% respondents in all types of roads, consisting of SR (46%), DR (6%) and UR (7%). Many respondents (54%) said the traveling time has reduced in all types of roads which comprise the respondents from SR (44%), DR (5%) and UR (5%) who have the feeling of reduction on travel time. That means the road users are more satisfied with reduction of travel in SR than other types of roads.
- (b) Significant percent of respondents (89%) agree that the traveling on roads in Nepal is reliable to reach their destination with majority of them (65%) from SR only.
- (c) Majority of vehicle drivers/owners (40%) feels that road and other road related taxes are low, 3 % responded very high and 4 %, adequate, while 53% of respondents are unaware of road related taxes.

3. Comfort and Convenience:

- (a) 41% of respondents feel that the roads in Nepal are free from congestion; response ranging from "somewhat free" to "absolutely free" with 31% in SR and 10 % in other roads. Similarly, 23 % feel neither free nor congested and 36 % feel congested. Again, 42% respondents say the road width is adequate with nearly 33 % respondents from SR only.
- (b) Majority of respondents (46%) are satisfied with the road quality, road-surface, smoothness and appearance of road. Comparatively, quality of strategic roads is better than other roads. Similarly, 56% respondents were satisfied with overall condition and maintenance of roads with 47% respondents from SR only. They said the road condition improved marginally particularly in SR and subsequently the travel time has reduced
- (c) This is a negative attribute of satisfaction. Significant number of respondents complained that while traveling, major irritating factors were poor road condition, narrow width of road, aggressive and unnecessary overtaking, and reckless road crossing by pedestrian and cattle, and road side parking especially in SR. Road users' level of attributes on various causes of irritation are over speed (42%), over taking (39%), parking on road side (45%) and narrow road width (43%).

- (d) In road users' perception, major causes and extent of delays were due to inadequate road width, poor or no information of maintenance works in progress, wrong parking by other vehicles and police checking.
- (e) Mostly road users are dissatisfied with the quality of existing road marking and distance signs on different roads.

4. Safety Aspects:

- (a) Nearly 36% road users feel safe while traveling on all types of roads. Comparatively, hill roads are more risky than Terai ones due to improper management (narrow road, sharp bends, poor road sign and inadequate attention to maintenance activities).
- (b) In respondents' perception about road safety, majority of respondents (47%) feel that safety aspect of road design is good, 26% respondents feel neither good nor poor and 27% respondents have rated as poor.
- (c) Nearly 58% respondents are not satisfied with the present practice of installation of road signs and feel that these are required more at proper places.
- (d) Overall 60% respondents feel accident management and time to clear the road is quick. It includes nearly 44% respondents from SR where accident management is comparatively better than other types of roads.
- (e) Almost all respondents are satisfied with the availability and accessibility of police post on all types of roads in Nepal. Comparatively Strategic Roads are better in this aspect.

5. Travel Amenities:

- (a) Almost 95% road users are satisfied with the availability of road-side amenities such as public toilets, restaurants/shop, public drinking water, medical facilities etc. The satisfaction level of perception about the availability of amenities is high in SR (67%).
- (b) Majority of road users (86%) are not satisfied with parking facilities on all roads. District Roads and Urban Roads are comparatively better in this aspect.
- (c) Nearly 54% road users say that the road side plantation is adequate in all roads. Comparatively, the road side plantation is assessed to be better in SR.
- (d) Significant numbers of road users were not aware of toll-charge and other road related taxes and its utilization in road repair and maintenance works. Many road users expressed their views that the prevailing toll-charge rate was low. They also strongly stressed upon its proper utilization on road maintenance works.
- (e) Majority of road users were not familiar or aware of roles of Road Board Nepal and had very little idea about its role in road maintenance management. When they were notified about RBN's role they stressed for regular supervision and effective monitoring by RBN.
- (f) Perception of female road users on public toilets, taps, rain shelter/bus stop and parking facilities is highly dissatisfactory. Responsible road agencies mainly DoR for SRN, DDC for district roads and Municipalities for urban roads have to adequately address these aspects.

6. Perception about Road Agencies:

- (a) With regards to users' perception about road agencies, many respondents (55%) regard the DOR as the main responsible agency for road maintenance activities, 25% of them are not sure about the organization responsible for road maintenance while 11% assume all agencies responsible for it. Level of attributes on DDC and Municipalities are 4% and 5% respectively.
- (b) Only 28% respondents were satisfied with the quality of maintenance works carried out through road agencies.
- (c) In view of promptness to redress complaints, only 43% road users made their complains to road agencies regarding road related problems out of which 66% road users were satisfied with their complaints redressed by road agencies.

- (d) Respondents' level of satisfaction on timely resolving road related problems is nearly 38% satisfied, 39% neither satisfied nor satisfied and 12% dissatisfied.

7. Overall satisfaction:

- (a) When respondents were asked to rank priorities for improvements in road service delivery (comfort and convenience, safety, value for time, value for money, travel amenities and visual appeal) on better road services to be delivered by road agencies, majority of respondents (60%) ranked the comfort and convenience as '1', safety as '2', Value for time as '3', Travel amenities as '4', Value for money as '5' and Visual appeal as '6' where '1' being the most important, then '2' and so on.
- (b) When respondents were asked to rank priorities for improvements on road structures (widening existing roads, informatory/warning signs, make significant road width, more road side facilities, tougher road traffic rules enforcement and widening/improvement of curves) on better road services to be delivered by road agencies, majority of respondents (60%) ranked widening the existing roads as '1', informatory/warning signs as '2', Make significant road width as '3', More road side facilities as '4', Tougher road traffic rules enforcement as '5', and Widening/improvement of curves as '6', where '1' being the most important, then '2' and so on.
- (c) The awareness of 'traffic rules and regulations' among the road users have substantially increased from RUSS-I to RUSS-II. But installation of appropriate road signs at proper locations has to be further stressed as observed in RUSS-II.
- (d) Private hospitals (mainly clinic) have increased along all road sections, whereas the government hospitals remained the same or seem even decreasing in RUSS-II which is mainly due to the increase in survey length and number of service centers as compared to RUSS – I and the government hospitals remaining the same numbers.
- (e) In RUSS – II, the satisfaction level on adequacy of 'road width' has increased in SR, but decreased in DR and UR as compared to RUSS-I. Similarly the road congestion in SR has decreased in RUSS-II but increased in district and urban roads due to inadequate road width.
- (f) The outcome of survey result shows that the satisfaction level of road users on 'safety aspect' has increased in RUSS-II, but at the same time many road users regard it as decreasing too. Similarly, the road users' satisfaction levels on the 'road reliability', 'quality of road maintenance' and 'timely maintenance of roads' has increased in RUSS-II as compared to RUSS – I.

8. Future Policy and Operational Priorities:

- (a) Road users pointed out to adopt the procurement of works in time and transparent manner. They supported e-bidding process and stressed on the quality of works.
- (a) Most of respondents suggested that the illegal encroachment of right-of-way can be significantly reduced with the help of NGO/local political leaders/local administration and police.
- (b) Road users complained that the district and urban roads are not wide enough for the traffic plying on these roads safely and comfortably and stressed for wider roads and proper drainage.

9. Road safety Aspect:

- (a) Road users suggested for campaigning programs for raising awareness of road safety aspects among road users by the use of various media like FM radio, television, display of posters with the help and participation of NGOs, community-based organization, schools, chambers of commerce, traffic police and strict enforcement of traffic rules and regulations.
- (b) Road users stressed for sufficient and appropriate road signs to be installed at proper locations on all roads and strategic places like sharp bends, blind curves, diversions, road works on progress etc.

10. Traffic management:

- (a) Majority of road users suggested that the speed limits should be specified for segments of roads at key locations like schools, hospital, market places etc.
- (b) Road users suggested reforming the prevailing policy to ban old vehicles from urban areas.
- (c) Majority of road users were in favor of private-sector participation for the road maintenance works.
- (d) Road users suggested discouraging overloaded / over passenger vehicles from all types of roads.

Recommendation and Suggestions

The users' perception and consultant's recommendation with suggestions are as follow:

S. No	Agency	Users' Perceptions	Consultant's Recommendation and Suggestions
1	Roads Board Nepal (RBN)	<ol style="list-style-type: none"> 1. RBN should allocate the budget for maintenance to different road agencies on the need basis and its performance. 2. RBN should monitor and evaluate the performance of road maintenance. 3. RBN should ensure that toll-charges are utilized in road maintenance works only. Some of road users said toll-charge is low and many are unaware of it. 	<ol style="list-style-type: none"> 1. The Board should consider the work performance of concerned agencies like DOR divisions, DDC and Municipalities for the release of further budget on their work performance 2. Maintenance and repair of all types of roads are carried out by different road agencies and the Roads Board should monitor and evaluate the performance all works regularly. 3. RBN needs to inform the general public through media and television about the toll-charge so that they are convinced that their charged-money is properly utilized in road maintenance. The Board should be in a position to fix the toll-charge reasonably with regards to current inflation rate.
2	Department of Roads (DOR)	<ol style="list-style-type: none"> 1. DOR should continue the process of e-bidding for the procurement of maintenance works. 2. DOR should identify the illegal encroachment of right-of-way. 3. DOR should improve the road condition, road geometry, quality of road maintenance and implement the installation of sufficient road signs and road marking. 	<ol style="list-style-type: none"> 1. 1DoR has been continuing e-bidding process for a quite long time; it should be encouraged to continue for the elimination of all bidding hassles like cartelling to suppress competition, physical threat to bidders, tampering of tender files etc. 2. DOR should check the illegal encroachment of right-of-way well in time with the help of NGO/local political/local administration and police force. 3. DOR should take up the study for the improvement of road condition and road geometry like sharp bends, improper curves and hair pin bends, narrow width to be widened, installation of sufficient road signs and road marking for reliable, safe and comfortable traveling on roads so that road accidents can be minimized in both

S. No	Agency	Users' Perceptions	Consultant's Recommendation and Suggestions
		<p>4. DOR should be alert for road accident management, and resolve other road related problems quickly.</p> <p>5. DOR should construct places for parking facilities, public toilets, taps, rain shelter and places for bus stop required along the strategic roads.</p>	<p>hilly and Terai roads.</p> <p>4. DOR has been initiating with its heavy equipment to clear the debris resulted from natural calamities and road accidents and should be alert as usual particularly during rainy season. DOR should improve the satisfaction level of road users by resolving the maintenance, quality and repair of road related problems in time.</p> <p>5. In response to respondents' satisfaction level with the parking facilities, DOR should initiate for the construction of parking places, public toilets, taps, rain shelter and places for bus stop along SR and city areas to avoid accidents and congestion.</p>
3	District Development Committee (DDC)/ Municipality	<p>1. Improvement of the road features / structures and installation of sufficient road signs and road marking in both hilly and Terai roads.</p> <p>2. Installation of required number of streetlights and construction of the parking facilities, public toilets, taps, rain shelter and places for bus stop along the roadsides.</p> <p>3. DDC and Municipality should provide information on road works on progress.</p> <p>4. DDC and Municipality should be ready for road accident management and clear it quickly.</p> <p>5. Plantation of trees along the roadsides.</p>	<p>1. As per the findings of road users' perceptions, DDC/Municipality should carry out detailed study for the improvement of all road geometry like sharp bends, improper curves and turns, narrow road, installation of sufficient road signs and road marking for reliable, safe and comfortable traveling on roads. Routine, recurrent and periodic maintenance and improvement works should also be taken up timely to keep the road free from potholes and cracks.</p> <p>2. From the perspective of 'Safety', and 'Comfort and Convenience', DDC and Municipality should take up the detail study for the installation of streetlights and construction of parking facility, public toilets, taps, rain shelter and places for bus stop along the roads and within city areas.</p> <p>3. As road users have little information on road works, DDC and Municipality should provide detail information about the existing condition of roads and works on progress</p> <p>4. DDC and Municipality should have trained technical man-power and sufficient equipment to deal with accident management and clear it as quickly as possible without interrupting the traffic.</p> <p>5. Majority of road users feel that plantation of trees along the roadsides is not adequate. So, the LRA especially the Municipality should take initiatives for this work with the cooperation of NGOs and Department of forest.</p>

S. No	Agency	Users' Perceptions	Consultant's Recommendation and Suggestions
4	Department of Transport Management (DOTM)	<ol style="list-style-type: none"> 1. Raising awareness of road safety among road users. 2. Strict check on polluting vehicles and ban old vehicles in city areas and establish network linkage with police. 3. DOTM should arrange on the job training to non-motorized vehicle drivers and road users, and reform the policy of license. 4. Prohibition of heavy vehicles in the city. 	<ol style="list-style-type: none"> 1. DOTM should launch rigorous campaign for raising awareness of road safety aspects among road users with the co-ordination of Road agencies (RBN/DOR/DDC/ Municipality). Utilization of helping hands of various media, television, NGOs, community-based organization, school, chambers of commerce, traffic police can be effective. 2. DOTM should check strictly on polluting vehicles in the city with cooperation from police and should reform the prevailing policy to ban old vehicles from urban areas. Also, DOTM should co-ordinate with traffic police to establish network linkage with them to establish network linkage between them for the management of accidents. 3. DOTM should arrange on-the-job training to drivers including non-motorized vehicle drivers and road users and should reform prevailing licensing-system so that only competent applicants get their driving licenses. 4. DOTM should take initiative with regards to prohibition of heavy vehicles in the city. For this purpose institutional strengthening of DOTM is needed to install and manage effective axle-load mechanism.
5.	Traffic Police.	<ol style="list-style-type: none"> 1. Enforcement of traffic rules and regulations. 2. Penalizing the violators of traffic rules and regulations. 	<ol style="list-style-type: none"> 1. Traffic rules and regulations can be enforced effectively by the traffic police who need to mainly concentrate in controlling unsafe driving habits such as drunk-driving and over speeding. 2. Violations of traffic rules and regulations should be strictly penalized and driving license should be confiscated on the event of violating traffic rules several times.