

Background

Fiji an island nation in the Pacific with a strategic location in trade and travel between the American continent and countries in the Pacific, Indian Ocean and Asia. Over time it has developed as a major trade and business centre of the Pacific with its developed infrastructure and commercial vibrancy. It is commonly referred to as the hub of the Pacific with most regional and international organisations being located in Fiji.

The population of Fiji is currently at approximately 775,000. Fiji's major foreign exchange earners are tourism and sugar followed by manufacturing and mining. Notwithstanding the political crisis of the last 10 years, economic growth has been steady and vibrant. This has resulted in demographic and social changes due to growth in affluence. Steady growth in motorisation as a result comes with its problematic complex issues associated with motor vehicles. The road safety implications of these changes is the subject of this paper.

Past and present

Urban dwelling in Fiji developed progressively over time in the absence of systematic town planning, a trend experienced also in other major cities in the developed and developing world. Location of cities and towns were developed at locations mostly on the basis of their ability to facilitate business and commerce activities through an appropriate transport system. On a closer examination of the above will reveal cities being located on the banks of major rivers or a harbour shore for ease of boating and shipping movements.

The advent of the motor car increased the ability to move goods and people around with the growth of commercialised activities. These brought demographic, social and economic changes to the countries population. Fiji is no exception experiencing steady growth in affluence among its population and rapid motorisation. The number of vehicles registered in Fiji is growing at an average annual rate of almost 4%. With the increased motorisation comes the associated problems, one of which is the unsustainable level of accidents on our roads. New road developments have also increased mobility and increased kilometers traveled.

Fiji has been undergoing a transport infrastructure improvement programme since the late 80's to match its forecasted economic growth. Part of its objective is to reduce transport costs which will further enhance the ability of the local industries to be competitive in the world markets. A realisation of the fact that the transport of goods and services to the market place in an efficient and safe transport network is a prerequisite for a sustainable economic policy.

Landuse and settlement patterns in the main centres has also experienced change due to commercial and industrial growth resulting in travel behavior changes in a poorly defined road network hierarchy. In this context vehicle movements are unrestricted and becomes a safety hazard in high populated and commercially developed areas. The location of new residential

areas away from the main city centres where the majority of the offices, business centres factories are located is a testimony to the above. An example of this trend is the capital Suva where nearly all the services, schools etc are still centrally located. This gives rise to congestion on major trunk routes leading into the city and also increased vehicle kilometres traveled and increased chance of accidents occurring. Traffic volume in the city and its peripheral has been increasing at the rate of 3-4% .

A growing economy, a increasingly motorised population and an inadequate provision of quality road networks with appropriate infrastructure leads to high risk accident occurrences. Thus the need for some redressing of road safety issues in Fiji.

Road safety – the last 10 years

A growing economy with increased population affluence are the main factors in the rapid growth of motorisation. The vehicle numbers have increased by more than 40% in the last 10 years. This growth is concentrated mainly in the main urban centers where the core business are located. Vehicle ownership is only around 8-10 vehicles per 100 persons but most of these are concentrated in the urban areas where rates are much higher. Despite being a low level compared to developed countries this nevertheless still creates traffic problems due to high density clusters in the main popular centers. The growth of vehicle population and urbanization has resulted in accidents becoming prevalent in densely populated areas and even in the rural areas due to ignorance and risk takings. Avoidable accidents are happening due to the above and is a cause for alarm for the road safety organizations. The sustainability of the transport policy depends on reduced accident numbers and more so, reduced fatalities on our roads.

The Fiji government recognized the importance of accident prevention in its overall social and economic obligation, especially with an image factor in the tourism industry. Through a grant from the Asian Development Bank (ADB), a road safety program for Fiji began in 1992. The main thrust of this initial work was to set up the institutional framework and the identification of the major stakeholders in the area of road safety. Major stakeholders tasks were identified and programmed with an allocated budget. A central body (National Road Safety Council - NRSC) was formed to coordinate relationships between stakeholders, promote awareness and conduct road safety campaigns.

In this period the emphasis was on the three E's, that is Engineering, Education and Enforcement to drive the plan forward to its next stage. The Ministry of Works (PWD) was responsible for the engineering; the Ministry of Education for education; and the Fiji Police for the enforcement component. Micro functions of the education section was the promotion and provision of road safety education in all the schools around the country. The Police traffic section was the enforcement agency and was also given the task of accident data collection through the computer program MAAP5 developed by the Transport Research Laboratory.

Enforcement has been supplemented and reinforced through the newly formed Land Transport Authority (LTA) since enforcement is one of its primary function.

Special Units were set up in the E's stakeholder organization to manage and carry out the various allocated tasks. Procurement of resources were also done together with recruitment of expert staff in their fields. A counterpart training program for local staff was also conducted to strengthen the human resource base and sustainability of the future plan. Apart from its coordinating function, the NRSC is also embarking on wide publicity and the provision of safety driver education. The body is currently assigned the task of preparing the next stage of the action plan (2001-2005).

The institutional machinery to activate the current plan is in place. However the success of the plan will depend on the adoption of the recommended supplementary policies for sustainability. Limited funds is a major drawback to timely implementation of the program. Since the majority of funding for the next plan will come from government sources, this expenditure will have to be justified and prioritised against other spending in accordance with project evaluation methods.

Wide publicity has brought greater safety awareness in the larger community, however this has yet to be transferred to a reduction in the number of accidents that occur. This hopefully can be realized during the plan 2001-2005. The total plan budget for the 5 year period is \$40million. However it must be noted that this figure includes a new ambulance scheme for emergency services and an increased appropriations for the medical facilities at the hospitals. It is envisaged that the plan will specifically identify target areas and factors which could reduce the road toll in Fiji. The plan's budget distribution to the allocated areas is conducive to the presumption of the anticipated result. However some questions remain: Is the budget sufficient for the plan to achieve its target over time? Will government keep its funding level? What is the acceptable level of accidents that the community can afford?

Accident trends

Table 1 shows road accidents trends for the last 10 years. The Table shows an average of 84 fatalities per year in the last 10 years. During the 1990s, there has been a general downward trend in fatalities at an average rate of almost 4% per annum in fatalities but concern is raised here, that this decrease will be neutralised by the increased number of vehicles registered per year. Preliminary figures for 2000 indicate an increase in fatalities. Benchmark for the relationship between road safety funding levels and accident rate could also be pegged here and is likely to show that the funding level will be out run by the increased number of accident fatalities occurring.

Over the last decade the fatality rate per 10,000 vehicles has fluctuated around a general downward trends. It showed a high of 23 in 1991 and has reduced to around 10-13 in the late 1990s. Preliminary figures for 2000 indicate that the rate will continue to be in this range.

While this rate is in the middle range of accidents by world standards, it could be masking some key issues in road safety. A more detailed analysis is warranted to discover the hidden complexity of accident occurrences in various locations in Fiji. Under the Fiji Road Safety Action Plan, the planned target is between 5-8 fatalities per 10,000 vehicles.

Table 1 **Fiji road accident trends (source: Fiji Police Accident Database)**

Year	Total Accidents Reported	Fatalities	Serious Injuries	Total Casualties	Accidents per 10,000 vehicles	Fatalities per 10,000 vehicles
1990	2,646	87	263	1,399	599	20
1991	1,998	108	313	1,342	417	23
1992	2,992	72	305	1,235	615	15
1993	2,985	91	382	1,221	589	18
1994	2,916	88	537	1,345	542	16
1995	2,973	83	492	1,365	537	15
1996	2,855	111	437	1,268	506	20
1997	2,872	73	392	1,117	494	13
1998	2,698	65	361	971	445	11
1999	2,873	63	291	833	451	10
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Table 2 **Accident fatalities by type and location, 1999**
(source: Fiji Police Accident Database)

Type	Fatalities	Percent
Pedestrian	28	44%
Car	15	24%
Pickup	10	16%
Bus/ MiniBus	6	10%
Other	4	4%
Urban	15	24%
Rural	48	76%

Accidents trends shown by Table 2 indicate the vulnerability of pedestrian on the road as in this case is nearly as double as fatality by car. This trend could be attributed to the inadequacy of pedestrian facilities on the road particularly in rural areas and the failure of the community to take heed of safety rules when the using road. The hypothesis is supported by the urban/rural

split, with three times more fatalities in the rural than the urban areas. Safety education and awareness should be directed to the rural areas to improve compliance on road safety rules.

Budget and targets

While budget provision presented with the plan is compatible with current accident rate and fatalities, the sensitivity of the rate of accidents implies that accidents will increase with the budget allocation. Catering for the long term sustainability of the plan will induce extra borrowing to finance the given plan. The funds to be borrowed is likely to progressively increase with the vehicle growth rate. Given that the rate of accidents is closely linked to the rate of motorisation in the country, the increased costs of maintaining the plan at the desired level over time will be an expensive exercise to keep up with. For example the annual growth rate (AADT) on major roads in Fiji is around between 3-4% which signifies an increase in vehicle ownership and kilometer traveled.

The trend on Table 4 also shows an annual increase in the private cars at 3% with buses at less than 1%. Kilometres traveled will increase as a result of increased private car usage. Recognition of the fact that kilometer traveled is directly related accident rate, measures should be adopted to control private vehicles over usage. Accident targets will only be realized when budget and demand for travel are at optimum level. A recipe for some serious planning on the part of the transport planner

In summary the plan will become progressively more costly financially while achieving the desired target will be even difficult. The plan fails to address the issues of sustainability in all respects to supplement the workings and an integrated solution is discussed below as the authors contribution to the plan.

The integrated solution

The implementation of the wider transport policy is required for the plan to achieve sustainable level given the increased motorisation and economic growth. Consistent application of the planning policy will reduce and contain accident at an acceptable level. The transport policy entails the safety with environment friendly (less pollution) and sound investment procedure (evaluation) to guide funding criteria.

Investment in transport

Funding levels for road safety programs should be determined from some quantified accident values and costs. This procedure raises the fundamental question of the value of life and how much the community is willing to pay to sustain a certain level of accidents. Opportunity cost will also come into the picture as to how much government is willing to pay for the required

service level. In the absence of the above information it would be quite difficult to evaluate real values to determine the real costs and benefits of the project.

In the initiation stage of the project in 1992 a general costing based on overseas prices was submitted as the basis for project approval. This has been carried through to the current plan as the justification factor without updating or adapting to local conditions in Fiji. Even at this stage of the project there should be a detailed review to determine accident costs appropriate for Fiji conditions. These costs are a valuable tool to justify Government spending and also for the purpose of sound financial management practices.

Cars versus Public Transport

Suva currently has a high level of public transport usage, as shown in Table 3. This could be attributed to the cheaper fares and a reasonably good level of service. Low fares in the taxi industry also contributes to the high proportion of taxi usage. There is also high percentage of population which use the walking mode which reflects to the high fatality number indicated in Table 2.

Table 3 **Mode split in Suva**
(source: Suva Transport Study 2000)

Mode	Percent of Trips
Bus	47%
Private car	34%
Taxi	10%
Walking	9%

Available data indicates that the accident rate for cars is 8 times more than for buses, and the number of cars in Fiji is increasing at three time the rate of the number of buses. These significant differences suggests that it is appropriate that a greater shift should be emphasised towards retaining and preferably increasing usage of public transport rather than private owned cars. This paper suggests that every effort must be made to allow buses to be used extensively into the various areas of the transport network system. A step in that direction would be the provision of adequate and visual attractive bus shelters at appropriate places to attract usage for bus patrons. Allocation of bus routes should be interwoven with patronage locations for example shopping centres facilities for bus, high density offices and factories, etc. From a marketing point of view the bus industry must made to be aware of their important role they playing in the transport network, which could be transferred to cleaner buses and keeping to

timetable schedule discipline. Priority lanes could be provided for buses during peak congested hours for through movement as an attractive option.

To add value to the road safety program, safety engineering design should be adopted and seen to be implemented by the responsible authorities. This will take into account the location of pedestrian walkways further away from the traffic lanes as possible to avoid and reduce chances of collision. It is evident during the recent road up gradings that putting the idea into practice is quite difficult and not been given priority. The initial capital outlay for the extra safety design component is seen as costly but it should be realised that it will pay itself over time in terms of a sustained accident prevention. The infrastructure deficiencies relating to safety should be proacted with a strong vision for safety from top the management of relevant ministries before it can happen at the micro level.

Travel Demand Management (TDM): The need to travel is a derived demand. The vehicle kilometre travel (vkt) highlighted earlier relates to the accident occurrences numbers. A systematic approach to reduce the need to travel warrants some travel demand measures to be adopted across the relevant ministries and authorities. The primary purpose of TDM is to reduce the usage of vehicles on the road system. Measures put in place will be attractive enough to give choice to the public in terms of minimising vehicle usage to the various places they wish to travel to, at least to do their shopping etc within the their suburbs. An example of controlling the need to travel is the location of shopping centres school etc in close proximity of the high populated areas. The TDM approach requires serious integration between city planners, engineers, education, business sectors, social workers etc for the long term sustainability of our roads as we are fast approaching capacity status during peak hours which could lead to serious road trauma.

Land Use Planning (LUP): Land use planning and travel demand management is normally a symbiotic relationship. Lack of coordination between the relevant ministries can be traced to the different direction and objectives or just the lack of appropriate knowledge to apply. Distribution and allocation of major land developments which will attract high density population and subsequently traffic volume should be given high priority at the planning level. The common objective of safety should be embraced by the authorities to ensure the consistency and implementation is carried out in this context.

Appropriate allocation of landuse conducive to minimising travel demand and safety design which contain pedestrian interest and walking facilities will go along way to sustaining vehicle travel and subsequently reducing the chance of accidents happening. Not only does TDM and LUP address safety in the transport policy but also take account of external costs of transport due to vehicle emission.

Institutional

Road safety concerns are wide and varied as realised from previous discussions. The complexities of issues and stake holders alike requires that the Minister of Transport have a stronger voice in the areas directly or indirectly related to transport to ensure compliance and consistency. This means that decisions affecting access to jobs, housing, business, industry and the like must be taken in an integrated manner. The transport minister can make full contribution only if he has a stronger voice in traffic and mobility and the impacts of decision taken outside of his sector. The planned road sector reform where all land transport line agencies come under one ministry (Minister of Transport) strategically confers a realistic decision model for action in the sector.

Conclusion

The paper has highlighted some practical deficiencies in the current approach in Fiji to road safety planning. Fiji has a road safety program in place but more needs to be done in terms of integration with broader transport policy and planning measures. In particular there is

- a need to conduct a study to determine accident costs which in turn will give quantitative figures for the benefit of project evaluation and justifications of fund allocations
- a need to incorporate and include elements of sustainable transport policy to supplement, help and realize the road safety vision
- a need for a stronger coordinating voice from the transport minister to other relevant ministries for the purpose of relevancy, leadership and will to deliver the main objectives of the safety vision
- a need for the integration of the transport policies with other sectors as regards road safety

The need to address this issues should be a priority in light of the likely outcome if not properly adopted in the plan. In as far as the vision zero is concerned, for Fiji it is still a dream at this stage but achieving our target would be a real possibility if the suggested concerns are fully taken on board as part of the plan.