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ECONOMIC REVIEW

Aug./Sept. 2011

Land Transportation

Kalabe Jayasinghe

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DIARY OF EVENTS

August

1st At the launching ceremony of the report titled 'Humanitarian Operation: Partial Analysis July 2006-May 2007' at the Hilton Hotel, Colombo, the Defence Secretary Gotabhaya Rajapaksa said that the 'wishard created by the LTTE's international propaganda machinery together with some in the Tamil Diaspora will be laid to rest with the publication of the report enabling the world to conclude beyond any doubt that the humanitarian operation was just.

2nd The Prime Minister of India, Mr. Manmohan Singh, told MDMK (Marumalarchi Thirukida Munnetra Kadavul) leader Vaiko that India cannot afford to restrict economic ties with Sri Lanka, as demanded by Tamil Nadu's political parties, to apply pressure to mitigate the sufferings of Sri Lankan Tamils.

8th Standard and Poor's credit ratings agency said that new global financial crisis would hit Asia harder than the last one (2003-2005 global financial crisis), especially nations heavily exposed to offshore markets or still receiving their budgets from the 2008-2009 crisis.

The first solar power plant established in Haruthakanda, Hambanthota, in Sri Lanka, was opened.

11th The President Mahinda Rajapaksa, on a four-day official visit to China, opened the newly-built Sri Lanka Academic Centre at the University of Foreign Studies in Beijing. The University conferred on Honorary Doctorate, on the President.

At a bilateral meeting held with the President Mahinda Rajapaksa, Chinese Prime Minister Wen Jiabao stated that China is committed to strengthen friendship with Sri Lanka and will extend its fullest support in all necessary situations to Sri Lanka at the international level.

12th The United States warned Sri Lanka of a possible international inquiry if adequate steps were not taken for a credible probe into charges of alleged humanitarian crimes during the LTTE war.

The Presidential Press Service of Russia said that the Russian President, Dmitry Medvedev signed a decree backing the UN Security Council resolution that authorised international military action in Libya.

13th The World Bank Chief, Robert Zoellick, warned of a 'new and more dangerous' time in the global economy, as Europe struggles to resolve its debt crisis.

16th Sri Lanka announced that it had clinched its largest ever single foreign investment deal by signing a \$ 500 million contract with a Chinese-led consortium to build a new container terminal.

18th The Sri Lanka government granted a US\$ 10 million credit facility to the Republic of Maldives exporting the Maldives import food supplies, especially fruits and vegetables from Sri Lanka.

22nd The Libyan rebel leader, Mustafa Abdel Jalil, hailed the end of the four-decade Kadafi era after his fighters took control of most of Tripoli.

26th Rebel fighters captured Moammar Kadafi's heavily-defended Bab al-Azizia compound and headquarters in Tripoli after a day of heavy fighting.

24th The Hurricane 'Ivan' pounded the Bahamas with sustained winds of 120 miles (193 kilometres) per hour and churned up heavy seas as it belled on a path toward the populous US east coast.

25th The President Mahinda Rajapaksa stood in parliament that there was no longer a need to impose emergency regulations within the country proposing that the parliament remove the emergency laws.

29th The President Mahinda Rajapaksa was honoured with the title 'Maharajadil' by the Law College, Colombo, to mark the Law College's 137th anniversary of its founding held at its premises.

September

3rd The Arab League and three international organisations approved plans to support the Palestinian's request for full membership in the United Nations.

4th The Russia's Foreign Minister, Sergei Lavrov, said that the BRIC (Brazil, Russia, India, China and South Africa) group of emerging powers is determined not to allow a Libyan style of solution to the crisis in Syria.

7th The Global Competitiveness Report (2011-2013) issued by the World Economic Forum (WEF) indicated a progressive increase in Sri Lanka's composite competitiveness index shifting from 62nd in 2010 to 52nd in 2011.

10th The IMF (International Monetary Fund) said now it recognizes the transitional government in Libya, paving the way for the incoming administration to benefit from the IMF's financial help.

12th The Special Representative of the President of Sri Lanka on Human Rights and leader of the Sri Lanka delegation to the United Nations Human Rights Council (UNHRC) Minister Mahinda Samarasinghe said at UNHRC annual session in Geneva that Sri Lanka has been willing to accept justified criticism and helpful comment of constructive spirit.

13th Telecast called on the world to speed up relief efforts after torrential rains exacerbated major floods, killing 270 people and making another 300,000 people homeless in the south of the country.

14th The US Assistant Secretary of State for South and Central Asia, Robert O. Blake, told the media at the end of his three-day visit to Sri Lanka that the US government commended Sri Lanka for the positive progress it had made on its recovery from a deeply-damaging and long-standing conflict. He also said that the deploying of Tamil Police in the Northern Sri Lanka is important.

Defence Experts of Sri Lanka claimed the Robert O. Blake's call to set up a 'Tamil Police' in the North is viewed as an 'unwarranted interference' in internal affairs of a sovereign State.

18th South Korean government ordered seven savings banks to suspend operations because of their poor financial condition due to heavy investment in risky property projects at home and abroad.

At least 60 people have been killed and hundreds people have been injured in the powerful earthquake of 6.8 magnitude (Richter Scale) that hit the Himalayan State, causing widespread damage to buildings and roads.

20th The President Mahinda Rajapaksa, when he attend the 66th UN General Assembly sessions in New York, explained Heads of State or Government, Kirghizstan and Nigeria, the progress achieved after the defeat of terrorism.

21st "Saving our planet, lifting people out of poverty, advancing economic growth and on the same fight," said the UN Secretary General Ban Ki-Moon, in his opening remarks at the 66th UN General Assembly session that opened in New York. He also emphasised the importance of a collective global effort to address this issue.

The President Mahinda Rajapaksa held bilateral talks with the Heads of State of Nepal, Colombia and Iran at the UN Headquarters in New York. During these talks, he apprised the State leaders of the progress achieved by the Sri Lankan Government in resuming IDPs (Internally displaced persons), de-mining, reconstruction endeavours and the recently-held local authority elections in the northern and eastern provinces.

22nd The President Mahinda Rajapaksa, on the sidelines of the ITN summit, briefed the Heads of State of Qatar, Uganda and Palestine about the progress achieved by Sri Lanka in the socio-economic fields following the total eradication of terrorism and the massive development programmes undertaken in the country.

Sri Lanka High Commission in Canberra stated that the Australian government and the Opposition voted together to defeat a motion moved in the Senate by Australian Greens Senator Lee Rhiannon (Senator for New South Wales) to suspend Sri Lanka from the commonwealth membership, calling for a full investigation into allegations of war crimes committed in the final months of the country's civil war.

23rd The President Mahinda Rajapaksa, addressing the 66th sessions of the United Nations General Assembly in New York, said 'without clash of ideas, opinions and values continue, we have clearly to recognise that dialogue, deliberation and consensus offer the only viable means for resolving differences. The might of powerful nations cannot prevail against justice and fair play'.

The President Mahinda Rajapaksa and the Indian Prime Minister, Mr. Manmohan Singh, discussed issues of bilateral interest and matters of importance at regional and international level at the UN premises in New York.

24th The Sri Lanka President Mahinda Rajapaksa met the Secretary General of Commonwealth of Nations, Kamalesh Sharma and the Maldivian Vice President, Dr. Muhammad Waheed Hassan, at the UN Headquarters in New York and discussed issues of bilateral interest and regional matters.

25th The President Mahinda Rajapaksa briefed the UN Secretary General at the UN Headquarters on the progress achieved since the end of the conflict in Sri Lanka including the massive infrastructure development in the North and the resettlement of the IDPs. The President also explained the measures taken by the government to expedite the reconciliation process including the continuing talks with the Tamil political parties.

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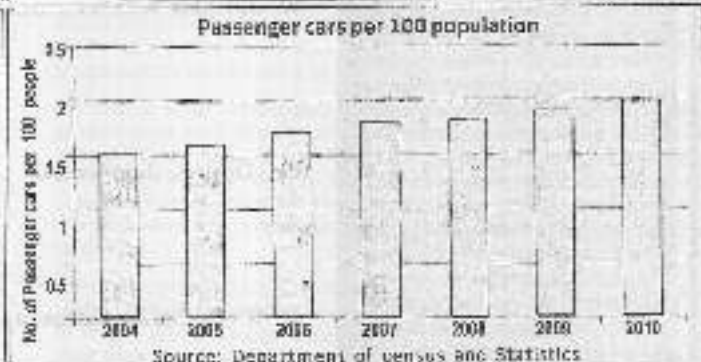
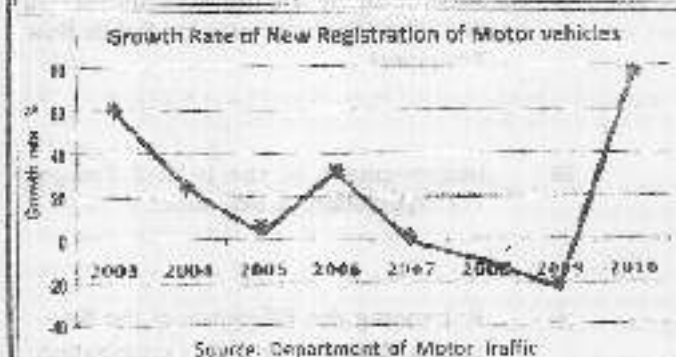
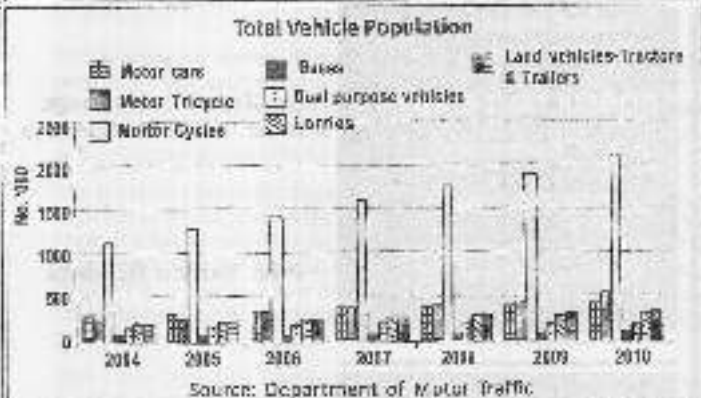
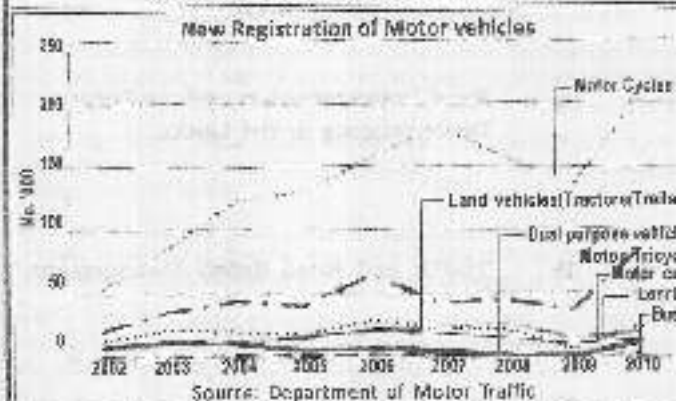
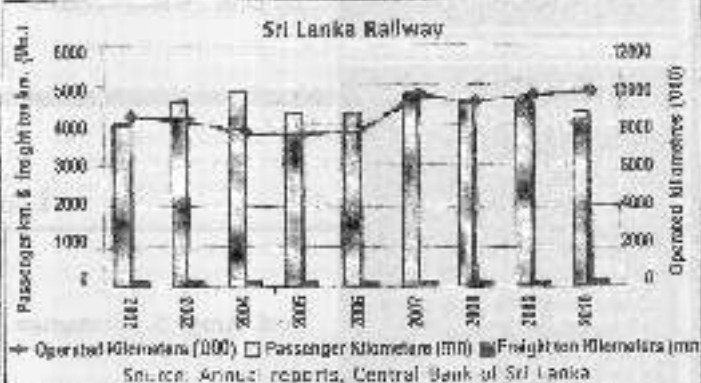
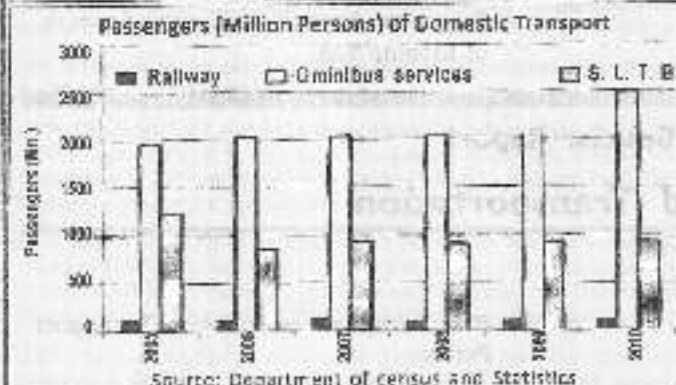
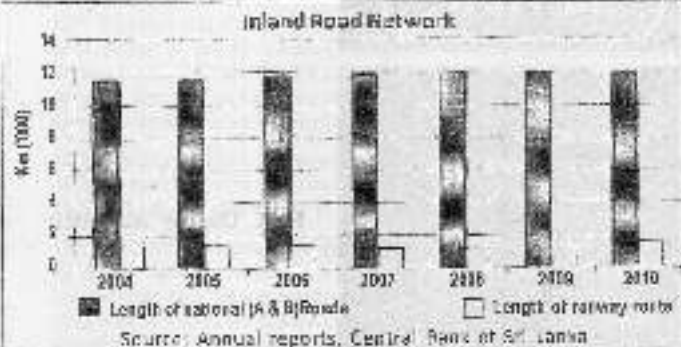
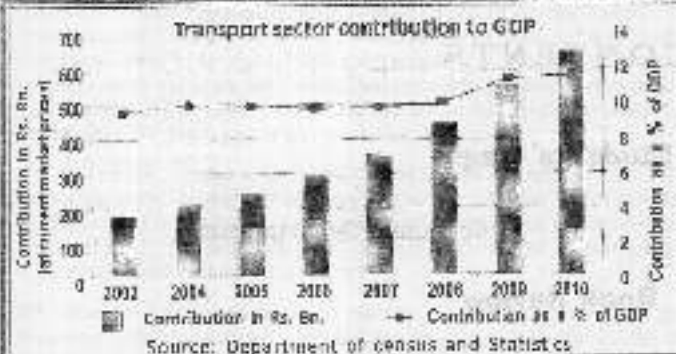
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SOME HIGHLIGHTS LAND TRANSPORTATION - SRI LANKA



Number of passengers travelling in a vehicle (Cars and Vans) - Colombo suburb*

Type of Vehicles	No. of Vehicles						Total No. of Vehicles
	with 1 passenger	with 2 passengers	with 3 passengers	with 4 passengers	with 5 passengers	with >5 passengers	
Cars	1047 (49.2%)	832 (39.1%)	183 (8.6%)	60 (2.8%)	09 (0.1%)	00 (0%)	2125 (100%)
Vans	161 (31.6%)	156 (30.7%)	89 (17.5%)	44 (8.7%)	27 (5.3%)	31 (6.1%)	508 (100%)
Average No. of Passengers in a Car							1.85
Average No. of Passengers in a Van							2.06

* Based on a study conducted by the Research Department of the People's Bank on vehicles that passed Dehiwala Flyover, Nugegoda Galleboda Handiya and Pellyagoda Flyover towards Colombo between 7.30 am - 8.30 am on 23rd & 24th August 2011.

New Perspectives in Land Transport Policy

Abstract

This paper discusses the current status of the land transport industry in Sri Lanka. It assesses the current and future demand for transport and discusses the limitations that are posed by current practices. The paper identifies five areas of policy-led change that are required to ensure that Sri Lanka responds in a timely manner to the future challenges for increased mobility, particularly for increased motorisation which is caused by increasing incomes.

Status of the Industry

Sri Lanka has a long and checkered history of multi-modal land transport development made up of highways, railways, buses and freight transport networks. However, the performance of all of these networks is currently considered by most users as unsatisfactory even though the demand for transport has been steadily increasing. The current transport activity estimated by the different modes is presented in Table 1.

At present, there is an estimated annual demand for nearly 100 billion passenger km to be carried by different modes of motorised transport that provide an estimated 27.7 billion vehicle kms through a fleet of nearly 3 million road vehicles and around 150 power sets and railway engines. In this endeavour, road transport accounts for 95 percent of passenger travel volume and 98 percent of goods transport in the country.

Buses carry 55 percent of the passenger kms, while para-transit, (made up of chartered and non-route buses, hired vans, three

wheelers and taxis) carry another 11 percent (Table 1). Transport activity is most dominant within the Colombo City and its environs with an estimated 220,000 vehicles entering the city daily carrying over 1 million passengers of which, 62% arrive by bus, whereas the railway carries another 12% with only 26% using the modes of private transport. (Kumarage and Weerawardena, 2009),

Vehicle ownership

Currently, motor vehicle ownership in Sri Lanka is around 150 vehicles per 1,000 persons. This is the same as in Singapore. However, in Sri Lanka around two-thirds of the motor vehicle fleet is made up of two and three wheelers. Buses used for public transport make up around 24,000 vehicles representing less than 1% of the fleet, while all forms of goods vehicles including land vehicles make up around 300,000 vehicles. Vehicle ownership has been growing at 11 percent per annum in the last decade, the highest in history. It is possible that Sri Lanka will observe a slowdown in registration of two and three wheelers with an increase in four-wheeled vehicles due to income increases, availability of low-cost cars and the reduction of import duties. With per capita incomes increase above USD 2000, it is likely that the next few decades will see an even higher rate of motorisation in Sri Lanka. As per

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capita incomes are expected to increase over USD 4,000 within the decade, most families would be able to afford a private vehicle (Kumarage, 2010).

Passenger transportation

Even though public transport has provided the backbone of passenger transport services over the last 50 years, continuing neglect by successive governments has led to its gradual deterioration and lack of modernisation. Passenger dissatisfaction is high, leading to an increase in motorisation made possible by rising incomes, especially in urban areas.

As shown in Figure 1 (Kumarage, 2010), the growth in passenger travel in Sri Lanka has kept steady pace with per capita incomes. This currently represents an average per capita mobility of nearly 5,000 passenger kms per annum and a vehicle use of 1,300 km per annum per person. According to international norms, this is around 3 times the personal mobility observed for other countries having a per capita income of USD 2,000

Table 1 Transport activities and modal shares of Sri Lanka in 2011*

	Vehicle Km (mn.)	%	Passenger Km (mn.)	%	Tonne km (mn.)	%
Bus	1,379	5	55,177	55		0
Railways	9	0	5,365	5	134.8	2
Private Vehicles	16,605	60	25,759	26		0
Para-Transit	4,841	18	11,348	11		0
Goods/Land Vehicles	4,819	17	2,585	3	6,436	98
Water Transport	3	0		0	32	0
Total	27,657	100	100,236	100	6,603	100

* Estimate by the Author

(Shaefer, 2008). As seen in Figure 1, this higher level of mobility has been observed for several decades starting with the rapid expansion of islandwide bus services by the nationalised Ceylon Transport Board (CTB) in the 1960s where mobility rates increased by 7 to 8 percent per annum even though there was no corresponding increase in incomes.

Road network

Sri Lanka has a reasonably well-connected road network of over 100,000 kms that provides satisfactory accessibility. Road density per km² is one of the highest in the region. Most of the national and provincial roads and the majority of urban roads making up around 30,000 km are paved. Nearly 30% of these roads have been rehabilitated or are in the process of being rehabilitated.

The national highway network consists of 11,919 km of roads and 4,200 bridges. As shown in Table 2 (Kumarage, 2010), the extent of road at lower levels of the network is even more impressive boasting over 80,000 km of rural roads in the country. However, the performance of the network in terms of speed and safety are not impressive, and in fact, may be termed unsatisfactory. According to the road condition data collected in 2008, only 33% of the national road network is in reasonably good condition. Majority of the balance roads are presently in unsatisfactory

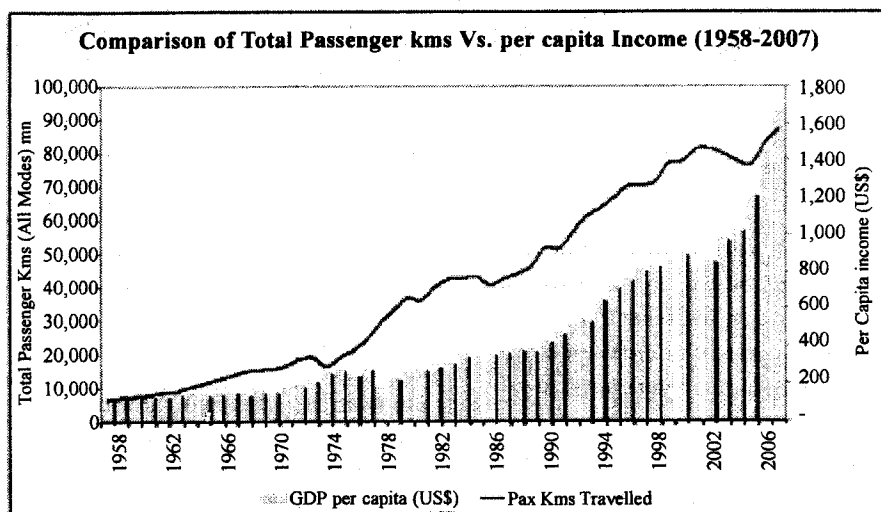


Figure 1 Growth of passenger traffic in Sri Lanka 1958-2007

condition or lacking the required capacity or proper geometric standards, thus contributing to unnecessary delays and accidents. In fact, about 9% of the length of the network has a surface roughness of more than 10 m/km which is considered most unsatisfactory and should be classified as barely motorable. With the national network in such poor standard, the provincial and local authority roads for which there are no measured indicators, are found to have even worse conditions. The first of a set of expressways is to be opened this year. This will add around 400 km to the road network connecting provincial centres, the port and the airport.

Railway transport

The full extent of the railway network in Sri Lanka was in 1923 when it had 1,540 km. Since then, except for a few new links, and

double tracking, line has been retracted and abandoned in several areas, reducing the line to 1,447 km with 172 stations and 161 sub-stations. It has around 150 locomotives and power sets in active service with around 550 passenger carriages and 900 freight wagons in operating condition and some track destroyed during the civil conflict are being restored (Ministry of Transport, 2011).

The railway requires engaging in the passenger and freight market it lost to road transport over the last several decades. With road-based congestion imposing restrictions, the railway requires more market-oriented approaches as well as a strategy to develop its markets, including access to ports and airports as well as multi-modal logistics centres and multi-modal passenger terminals inclusive of park and ride facilities to compete with improved road transport including the challenges that will be posed by the new expressway system.

Table 2

Historical development of road network

	National	Provincial	Access Urban	Access Rural	Total
1st Cent. BC	Road Network based on connectivity of Anuradhapura to ports in the North and East and connection between the different kingdoms and places of worship mostly in the dry zone				
11th Century	Coastal roads in the southwest after migration of people				
1815	Commencement of Road Building by British				
1905	6,024				6,024
1959	7,034			12,070	19,104
1990	10,447	14,916	2,791	66,054	94,208
2002	11,760	15,743	5,200	77,800	110,503
2009 ²	11,919	16,000	5,300	80,000	113,219

Source: Kumarage, 2010.

Bus transport

There are an estimated 23,228 buses operating public transport services in Sri Lanka. Of these, 4,758 are government-owned Sri Lanka Transport Board (SLTB) buses while the balance is privately owned. Of the privately-owned buses, 3,058 are issued inter-provincial permits by the National Transport Commission, while the others are issued permits for intra-provincial transport services by the relevant provincial authorities. The vast majority of private buses are owned by single bus operators who compete fiercely against each other on the route. Even though they are regulated, standards are poorly observed and quality of carriage has not materialised, even though there has been a high demand for investment in buses. There is no management structure for private buses, and hence, it operates mostly as an informal sector.

The SLTB is the fully government-owned bus operator and one time monopoly operator, whose market share has now reduced to 27%. It provides services throughout the country in competition with the private sector and is contracted by the National Transport Commission for a number of socially necessary services such as school buses, rural services and night services. Its primary role is to provide stability in the market and to prevent monopolistic behaviour on the part of the private operators.

Goods transport

Around 7 billion tonne kms of goods transport is undertaken in Sri Lanka annually. This translates to a per capita carriage of 340 tonne-km per capita per year. Historically, goods movement has increased by around 3 to 4 percent per annum at around half the rate of passenger mobility. The freight market share of the Sri Lanka Railway has come down to 2% in the recent past, from 32% in 1979 showing a drastic decline in the efficiency and competitiveness of

the Sri Lanka Railway (SLR) in handling freight. (Kumarage, 2011)

More than 90% of the total goods carriage within Sri Lanka is handled by private sector road haulers. As in bus transport, there are very few large-scale operators. Most truck owners can be categorised as small and medium entrepreneurs (SMEs) having one or a two trucks with only a handful owning over 20 trucks. This sector too operates mostly as an informal sector.

Para-transit

Para-transit, which is predominantly made up of over 350,000 three wheelers, also includes a wide cross section of other services ranging from school services to rural vehicles, all of which are also fully deregulated and provided through the informal sector. The high rate of accidents, low productivity and collusive behaviour are reasons as to why some degree of regulatory control may be required for these sectors.

There have been some recent efforts to organise this sector. Some taxi companies have continued successful Call Centre operations in Colombo. This is now being extended to the three-wheeler industry as well. However, there is a strong preference both from passengers as well as suppliers to continue with the informal and unregulated industry.

Current Transport Sector Policies

There are two specific policy proposals that have been formulated for land transport by the respective ministries based on wider government policies set out in 2005. The National Policy on Land Transport (Ministry of Transport, 2009) has been approved by the Cabinet of Ministers. The Land Transport Policy is a comprehensive document which gives clear direction for moving away from the current move towards motorization. It calls for priority of public transport over private transport, priority of rail

transport over road transport, priority of non-motorized over motorized transport. It also sets out strategies to improve the management of omnibus transport as well as para-transport by the formation of corporate entities. The National Roads Master Plan (RDA, 2007) was also completed in 2007. This sets out the development strategy for the national highways for the period up to 2016.

Current and future issues

With the anticipated 6 to 8 percent growth in GDP (Gross Domestic Product), it is expected that the demand for passenger mobility will increase at around 7 to 9 percent per annum. The vehicle growth rate is expected to reach a high of around 15% per annum. Based on this, and if the current rate of shift from public to private transport continues and taxes on vehicles and fuel remain at the current rates, the time required for doubling of road space would be 9 years. This will pose a huge burden on the economy due to the huge public investment and maintenance costs of highways, the private investment cost of vehicles and their operation and the external costs due to congestion, namely value of lost time and vehicle lost time. Vehicle km on the national network will increase from 27 billion to 55 billion vehicle kms by 2021, while passenger mobility itself will increase from 100 billion to 150 billion passenger kms per annum.

Even though Sri Lanka has a high density of roads, especially at the rural level, the quality of roads is an issue with most heavily trafficked roads having out lived their design life. The average network speed has been gradually reducing indicating that the expansion in road capacity is insufficient to keep up with the demand. This is most severe in urban areas. As a result, road speeds have not improved with many urban roads being congested during most of the day time. Road

safety is also an issue with design requirements especially those required for vulnerable road users including non-motorised users being inadequate or in most cases nonexistent. The opening of the expressways will improve travel between cities while making travel in and around Colombo slower due to the new traffic that would be generated by these expressways.

This will put enormous pressure on the existing transport infrastructure especially the road network in urban and suburban areas where the growth in economic activity is currently concentrated. Since it will not be possible to double the road capacity in these areas in such a short span of time, optional strategies would be to open up new urban areas or to rapidly improve quality of public transport.

Despite attempts made during the recent past, the quality and service of public transport has not kept pace in terms of modernisation and passenger comfort. This and rising per capita incomes have resulted in the gradual decrease of the share of public transport over the last three decades, even though the number of passenger carried has continued to increase the modal share carried by public transport viz a viz other modes has decreased. Estimates using TransPlan demand forecasting tools show that this will further reduce from the current 55% to 41% by 2021 and to 20% by 2031. (Kumarage, 2011)

The railway, though in continuous operation for nearly 150 years, requires re-engaging in the passenger and freight market it has lost to road transport over several decades. The depleted assets base, obsolete signal and communication system and aging rolling stock fleet severely constrain delivering a quality service to the travelling public and to goods shippers. This situation has further aggravated by the inappropriate organisation and management systems that have remained virtually unchanged over decades which are not geared to meet present-day customer requirements.

Bus Transport provided the backbone of passenger mobility since independence. The strong initiative provided by the CTB which served numerous villages in addition to urban and provincial routes also set high operating standards.

However, mismanagement, lack of adequate regulatory control has gradually eroded these standards. The bus sector, even though still carrying the majority of passenger trips, is also facing a challenge in modernisation fast enough to keep pace with the changing consumer preferences.

Even though Sri Lanka had one of Asia's best public transport systems up to the 1960s, there has been neglect in introduction of modernisation for efficiency, comfort and value addition. At present, there is hardly any use of modern information and communication (ICT)-based applications or computer-based applications in the planning, operations or in the public information dissemination within the sector.

Overall, the inefficiencies of the land transport system are many. Traffic congestion costs in the Western Province alone were estimated at Rs 32 billion in 2006, while accident costs are estimated at around Rs 20 billion per annum (Kumarage, 2010). The cost of avoidable delays, breakdown, waiting time in public transport are estimated to cost at least another Rs 30 billion to users, while losses in productivity due to issues of poor reliability, flooding, damages of goods in transit and other logistics related costs of the transport network may be estimated at another Rs 40 million at least. The combined losses would thus amount to over Rs 120 billion per annum, the equivalent of the annual public investment allocation for roads in 2010. This cost translates to 1/6th of the total expenditure on the land transport sector by both government and private sectors. Thus, the inefficiency may be termed at 1/6th which is considerably high.

The losses amounting from sub-optimal investments and lost economic productivity, poor design and construction supervision, drainage damage and other losses cannot be accurately estimated, but is likely to be greater than this. These together almost always results in transport in all its forms and variations- be it public or private, passenger or freight, road or rail, urban or rural to be often among the most complained of public services deemed as being unsatisfactory by both private and corporate citizens.

New policy perspectives

To provide a sustainable, efficient and effective solution to satisfying the increasing demand for mobility requires a new policy perspective. The following five new policy interventions which are diametrically opposite to current practice are recommended to correct the current trend toward transport chaos.

Policy intervention 1: Prioritising public transport over private transport

Sri Lanka has been following a 'Cars-First' policy with the import liberalisation in the late 1970s. The importance given to requirements of private vehicles and the corresponding neglect of improving public transport to remain competitive with private vehicles has given Sri Lankans a clear message that travel by bus or rail should be as long as you can get a car for yourself. Clearly, the increased congestion proves that policy is not sustainable.

In order to prevent gridlock on our roads, the envisaged rapid increase in demand for mobility discussed earlier will require a strategic approach that should essentially look at improving public transport as the most formidable but yet most sustainable approach. This can only be achieved by providing quality public transport demanded by passengers as demanded in keeping with their increasing

income so that they are converted from the once captive public transport users to those who will use a bus or train by choice. This would mean providing quality vehicles, high end services, modern multi-modal terminals, auxiliary facilities such as park and ride, better stations, modernisation of facilities and technology, electronic ticketing and seamless travel.

However, none of these may be achievable in the bus or rail system unless the following reforms take place.

i. Consolidating private bus owners into manageable corporate entities based on operational features and employing competent and qualified managers to convert them from the informal to the formal sector. It is noted that as long as the private buses are characterised by informal sector behaviour, it will not be able to respond to the challenges of modernisation and customer care demanded by the modern-day customer who likes to choose from different options.

ii. The SLTB also requires its own revitalisation to become an efficiently-operated transport company. While State-owned transport companies that provide exemplary services are found in many countries, such can only be achieved if independent and professional managers are allowed to develop such institutions without being called upon to subscribe to political objectives. Trade unions must be distinct and focus on worker welfare and allow management to focus on long-term viability and customer satisfaction.

iii. The management of the railway also needs reform to survive the commercial realities of transport service provision today. Innovating its services in keeping with customer preferences and technology, utilising its assets through better scheduling and dispatching, attracting new users

through provision of inter-modal carriage are opportunities that are available but un-developed.

However, the underlying requirement here is that government must realise that a right about turn is required in reforming the public transport sector to support a policy change to pursue a 'Public Transport First' policy. The failure to urgently and effectively reform the public transport sector will only allow the 'Cars-First' policy to continue to lead us to grid lock on our roads.

Policy intervention 2: Prioritising rail transport over road transport

Railways are well positioned to serve several transport applications. In Colombo and even in Kandy, it can be used to divert the excess demand for road travel to rail. It can carry large numbers of people to congested city centres in a short period of time, a feature that the road finds difficult to perform as efficiently. The railways can carry heavy containers on longer travel legs, thus shifting the concentration of manufacture from Western Province to the south, the east and the north of the country. It is well positioned to serve our international ports and airport. However, these valuable linkages need to be developed rather than merely confined to small roles such as carrying commuters at subsidised rates.

There are many opportunities that the railway has for making itself useful to the average Sri Lankan. Similarly, it has scope in electrifying the suburban services in Colombo or in carrying tourists. These are projects that have been mooted for decades but repeatedly ignored by political indifference and lacklustre leadership. Importing engines and carriages on regular basis and carrying out expensive track rehabilitations are essential for preserving an institution. But such alone is not adequate for the type of turnaround that the railway requires in Sri Lanka. What the people need from the railways is a

clear resurgence of service quality that will restore the confidence in the railway that would increase its use so that the people are assured that the railway exists to support the people and not vice-versa!

To do this, the railway has to be seen as a future mode of transport and developed by giving priority to services that it can best contribute. Expanding its network in areas where it has no competitive edge should be avoided. It should concentrate on areas such as urban commuter, long distance freight and leisure travel. The railway must be considered as economic tool and priority given to develop niche areas over road developments in such areas. As such, rail-based development must be given priority over road-based development in urban areas, in connection to heavy nodes such as ports and airports and trade zones.

Policy intervention 3: Prioritising non-motorised transport over motorised transport

A return to promotion of non-motorised transport is also a timely priority. Road transport increases trip lengths unnecessarily making users captive to motorised modes of transport. In today's context where increasingly people spend 10-20% of their waking hours in travel, many countries are actively investing in promoting non-motorised travel, mostly on bicycles. Even though large modal shares are not expected, they also promote short distance travel, as well as mitigate environmental pollution caused by motorised travel. A clear policy reversal is required in road design, in building design and in transport policy interventions in providing space and facilities for use of bicycles. The idea that non-motorised transport is archaic needs to be changed with clear policies that promote bicycle use.

Policy intervention 4: Prioritising professional administration over politicised administration of the sector

One of the biggest obstacles in reforming the transport sector is the critical shortcoming of professional administrators in the sector. Much of transport today is in the hands of the informal sector. This has given ample opportunity to enable politically-aligned administrators to be placed as managers and effectively used as gatekeepers for collection of benefits as opposed to task them to develop the sector. The lack of technical and managerial leadership in the sector clearly shows that it does not have professional administration capable of internal reform or development.

One clear policy reversal should thus be to ensure by regulation that the positions of management and administration in the sector will be filled only by the professionally-qualified persons. The long-standing belief that has continued over several decades now, which is that a political discard or the kith and kin of a minister can effectively provide leadership in transport which is a technical discipline needs to be reversed.

This is clearly illustrated in the fact that there is not a single institution responsible for planning or integration in the transport sector. Existence of multiple agencies in transport service and infrastructure provision, with poor coordination between them leads to fragmentation of the legal authority to plan and to enforce agreed upon plans, which causes duplication of effort and haphazard decision-making which in turn has made internal change and development impossible. Thus external-led reform is crucial.

Policy intervention 5: Prioritising modern transport and logistics systems over traditional systems

It is well-known that more than 30% of the agriculture produce goes waste before reaching the

consumer. Marked differences between farm-gate price and retail price prove the inefficiency in perishable produce transportation. Similarly, the amount of passenger time loss due to lack of bus time tables, intermodal coordination, runs in to billion of rupees a week. Accidents also contribute to over Rs 20 billion a year. Overall, the industry has had little technological innovation or systems change. The same systems that operated over the years are allowed to continue for fear of upsetting those who survive by them. These encourage the consolidation of the informal sectors which are politically powerful. However, they tend to be expensive as they promote waste and duplication of resources. The low utilisation of private buses, three wheelers and even trucks and vans are testimony to this fact. It is necessary to ensure that there is a compulsion to arrive at technological benchmarks before given years, in terms of vehicle technology, terminal design, warehouses, packaging, loading and unloading systems, etc. Systems to improve vehicle dispatching and routing are also necessary to ensure high level of productivity of resources and provision of high-quality transport services at the lowest cost.

Government policy to reverse the trend that traditional systems should endear should be replaced by a policy that favours modern and efficient systems. However, it should also be noted that over a million people are today employed in the transport sector. Many work in very oppressive conditions. Modernisation should not be an attempt to jeopardise their livelihood, but an effort to improve their employment. The billions of people whose economic welfare depend on the efficiency of transport services provided by

these people should also not be made to suffer loss on account of their refusal to improve.

Conclusion

It is apparent that the transport sector in Sri Lanka requires major change in policy to meet the future challenges that are to be posed by increasing mobility and vehicle ownership. In this case, five policy U-turns are essential to ensure that Sri Lanka can expect an efficient and sustainable transport system that will meet the expectation of its people and corporate citizens.

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Footnotes

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Road Transportation and its Future Developments in Sri Lanka

Abstract

The A- and B-class roads of the national highway network make the major part of the traffic-carrying network of the country. The development and maintenance of the network has been entrusted to the Road Development Authority of Sri Lanka. The development of the network at the initial stage was very slow due to the limited funds allocated for the development. With the realisation of the importance of the network for the economic development of the country, the government has launched an accelerated development programme with foreign funding. The development of high-mobility network has also been started, and they are in various stages of development.

Keywords: National Road Network, Expressways, Urban Traffic Congestion, Integration, Surface Transportation

Historical Background of the Road Transportation in Sri Lanka

For several centuries prior to 1850, the transportation in Ceylon remained as a public utility service. Since the economic activities were principally for local consumption, long-distance transportation and travelling with high speed was not essential. The use of manual labour, men and women carrying bulk on their heads or in make-shift litters, was the most readily available means, completely acceptable and representing a common mode of transport.

As the economic activities shifted to the export of raw materials, crude

rubber, coffee, tea and coconut, more rapid and efficient modes of transport were required. This gave rise to the use of marine shipments along the coastal and inland waterways, and bullock-carts and railways on the land. During the early 19th century, the motor vehicle, especially lorry, altered the existing concepts of passenger and goods transport.

Organisational changes

Prior to 1850, under the colonial administration, the surveying of and the construction of roads in the island had been a function of the military authorities up to the year 1833. These functions had been handed over to the civil authorities of the colonial administration in 1833. From 1841 to 1850, there had been a separate "Department of Roads" under the Commissioner of Roads, Major Thomas Skinner. In 1851, the name of the Department of Roads had been changed to "Civil Engineer and Commissioner of Roads Department". It was known by this name till the year 1862. It was in the year 1863 that the name had been changed to "Public Works Department" (PWD), but the designation of the Head of

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Department had remained unchanged. It was only in 1867 when Major Skinner retired, that the designation had been changed to "Director of Public Works".

In October 1969, the PWD was separated into two departments, namely, the Department of Highways and the Department of Buildings. The PWD continued by that name from 1863 to 1969. In 1905, there were 3,765 miles of major roads in Sri Lanka.

In 1971, all functions of the road maintenance and improvement of Department of Highways were handed over to the TCEO (Territorial Civil Engineering Organisation) of the Ministry of Irrigation, Power and Highways, leaving the Department only with the major highway and bridge projects. It was around this time

that the overseas system was abolished. After that, the Bridges Organisation of the Department

Table 1 Road lengths in kilometres in selected years in Sri Lanka

Road class	1946	1963	1971	1981	1991	1996
All roads	10,730	20,123	21,496	65,890	94,651	100,000
"A" class	1,400	1,800	2,201	3,798	4,116	4,220
'B' class	1,300	2,700	3,100	5,059	6,465	6,908
'C' class	1,800	3,500	4,488	10,856	5,012	8,457
'D' class	2,600	3,800	2,972	7,606	9,078	5,346
Others	3,630	8,413	8,735	38,571	69,980	75,069

Sources: Arjuna Atlas of Sri Lanka, Road Development Authority and Central Bank of Sri Lanka

was converted into a corporation called the "State Development and Construction Corporation".

In 1978 when the TECO was scrapped, the road maintenance functions were again handed back to the Department of Highways. In 1985, all functions of the Department of Highways were handed over to the Road Development Authority (RDA) formed under the Road Development Authority Act No 73 of 1981. With the 13th amendment to the constitution, only the national highways which consist of A- and B-class roads were left with the RDA and other roads were handed over to Provincial Councils.

Road network

Since the independence, the successive governments have paid more emphasis on improving and expanding road transport infrastructure than the other transport sectors such as railways, inland waterways, coastal shipping, etc. In a way, this has been an outcome of an attempt to accommodate the growing transport demand rather than a carefully-planned infrastructure development programme considering the needs of the overall transport sector, bearing in mind macroeconomic goals and objectives. Table 1 provides information on the road length of the country for some selected years since 1946.

Road transportation of Sri Lanka

The first passenger car was imported to Ceylon in 1902. The road system at that time was only main roads connecting principal towns. They were metalled and tarred, and had sound bases suitable for traffic conditions at the time. Road construction preceded vehicles, because of the need for permanent roads which could withstand the torrential rains. Many steel bridges

Table 2 Road transportation indicators for the year 2011 in Sri Lanka and in some selected countries

Country	Road Density (km/square km)	Contribution to transport demand (%)	
		Passenger	Freight
Sri Lanka	1.50	92	98
India	0.66	95	65
United States	0.65	89	60
China	0.16	-	-
Brazil	0.20	-	60
Pakistan	0.34	91	96

had also been constructed by the year 1900. Other roads were not "constructed" but merely graded by rather primitive means.

Some of the historical landmarks in the road construction are given below:

i. The Bridge of boats near Colombo to cross the Kelani River was completed in the year 1822. This was used till 1895.

ii. The Kandy road via Kurunegala and Galagedara was completed in the year 1831.

iii. The Kandy road through Kadugannawa was also completed in the year 1831. The construction of this road had been taken about eleven years.

iv. The first lattice girder bridge by the name Victoria Bridge was built in 1895 over the Kelani River.

By the time of the advent of motor lorry in 1907, the beginning of a planned-constructed, all-weather, motorable road system had been started.

The road system was gradually and progressively extended and improved so that during the period after 1945, it was reasonably able to accommodate an unprecedented growth of motor vehicles. Since then, the use of the motor vehicle has been grown rapidly. The PWD has added almost 5,000 miles of additional road to its system since 1947. During the same period, the number of vehicles, however, has almost tripled.

During the seven year-period from 1955 to 1962, while the road mileage has shown only a slight increase, the number of motor vehicles have increased at unprecedented proportions, especially during the three-year period from 1958 to 1961.

According to the record of the Road Development Authority, the islandwide ratio of persons per motor vehicle decreased from 177 in 1947 to 71 in 1961. These figures compare favourably with the ratio of other nations of the world and serve as a barometer of the rapidity with which Ceylon, since its independence in 1948, is approaching the saturation rate of the more highly-motorised nations.

Development of National Highways in Sri Lanka

Sri Lanka has a well-spread network of roads with a total length of about 116,800 km as per last year records of the Road Development Authority. The RDA maintains a total length of 12,020 km of trunk and main roads (A- and B-class roads) designated as National Highways. The secondary roads totalling about 16,000 km are managed by the Provincial Councils. There are about 4,000 km under government institutions like Mahaweli Authority, Department of Forests, Department of Irrigation, etc. The balance 84,800 km are minor roads that fall within various local bodies. The total length of roads, thus, accounts for a density

of 1.5 km per sq. km of land area. This is considered quite high when compared with that in other developing countries. (Table 2).

Despite this high road density, the land area occupied by roads in Sri Lanka, is quite low due to narrow widths of the right-of-way of our roads.

The road transport which accounts for 98% of the total freight transport and 92% of the total passenger transport of the country far dominates the other modes of transport as railways, inland water transport and air transport. This is due to many technical, economic and social advantages of road transportation over the other means, such as:

- i. Comparatively low coverage of the island by railways
- ii. Reliability of the road transport service
- iii. Personalised use of road transport
- iv. Well-spread network of roads
- v. Deterioration of railway service in the past

In view of that the dominant role played by road transport compared to rail and other modes, demand is bound to increase and not diminish in the future. Therefore, the importance of the maintenance, rehabilitation, upgrading, expanding and development of the road infrastructure of the country need not be over-emphasised. Major part of the traffic of the country (70% of total vehicle kms) is carried on the national highway network as the network is well spread all over the country. (Transport in South Asia, viewed 18th November 2011, < <http://go.worldbank.org/HYDXPSL17Q>>).

Development plans of the national highway network

In spite of this substantial increase in traffic demand, there was very little investment for the construction of new highways or for widening and improving the existing trunk roads prior to 1985. From 1985, the RDA has undertaken several major road rehabilitation programmes with the foreign-donor assistance (Table 3).

The following activities have identified by the RDA to increase the capacity of the road network to meet future demands of economic development of the country:

i. Development of high-mobility network (Expressways/Motor ways/High standard new major highways)

There is a need for improving the high-mobility intercity highway network as limited access expressways to reduce the travel time for intercity travel as a special need. It is expected to improve the national economy by saving important working hours by saving passenger travel time and freight travel time in long-distance travel. This need can be justified by analysing the speed and the accident of our national road network compared to that in other developing and developed

Table 3 Improvements to national highways during 1985-2004

Period	Length (km)	Funding source
1985-1987	299.15	World Bank
1986-1992	219.00	ADB
1992-1995	274.00	World Bank
1992-1995	154.30	ADB
1996-2001	184.56	ADB
1999-2002	44.00	EDCF Korea
2000-2004	174.00	ADB
2001-2004	71.00	JBIC Japan

ADB - Asian Development Bank

EDCF - Economic Development Corporation Fund

JBIC - Japanese Bank of International Corporation

Source: Record of Road Development Authority

countries. The average speed on national road in United States is 60km/h in urban areas and 80 - 110km/h in rural areas. The average speed that can achieve in Sri Lankan national roads at present is 40km/h in urban areas and 70km/h (is the maximum design speed) in rural areas. However, due to the demand for high-speed travel for intercity travel on this national road network, drivers tend to violate the speed limits which results in serious accidents. Therefore, it is required to construct high-speed mobility network, in addition to improving the existing national road network in Sri Lanka.

ii. Major improvements to the existing national highway network including realignment

The present design speed standard for the majority of the national highways (almost all B-class roads) is 40km/h due to the existing road geometry as well as their pavement condition. However, as per the worldwide records, average

Table 4 Average accident rate on Galle Road (Matara - Hambantota)

Type of Accident	Number of accidents reported or estimated per year	Accident rate on A2 (accidents per mn vehicle kms)
Fatal	52	0.7
Grievous	94	1.3
Non-grievous	190	2.7
Damage (Reported)	210	3.0
Damage (Unreported)	1,000	14.2

Source: Economic Feasibility Report, Extension to Southern Expressway from Matara to Hambantota, , University of Moratuwa, 2007.

demand should be at least 70km/h on national highways to contribute to increase economic growth. The police records indicate that the accident rates are increasing with the increase in vehicle growth rate. The main reasons can be the bad geometry, especially in rural areas, deteriorated surface conditions, driver stress, increased travel time, congestion with reduced road capacities in urban areas, and uncontrolled, unauthorised roadside development, etc. Also the major burden to RDA is the need for investing a large amount of money on maintaining these aged road pavements to maintain a satisfactory level of service to the users. Therefore, it is required to improve the national road network with very good surface and improved geometry.

iii. Construction of a system of ring roads/major by-passes and flyovers to cities, major towns and important urban centres

One of the major problems in road transportation is the concentration of traffic movements in urban areas. This is due to the concentration of the urban activities in certain areas and increased local traffic movements within such areas. Therefore, additional capacity developments are needed in the absence of traffic management schemes which can also be used to reduce traffic demand in urban areas. Even though, these traffic management schemes are successful in countries like Singapore, Malaysia, England, none of the Sri Lankan Governments has initiated any congestion pricing so far. Even though this will be a social issue in the short term, it is important to consider congestion pricing for busy areas like Colombo in the long term as increased

capacity will create more traffic to busy areas and will not be a long-lasting solution to the traffic congestion in Sri Lankan cities.

The infrastructure development options for the medium term should be construction of by-pass roads in congested cities to ease the long-distance trips. Introduction of carefully-planned flyovers to improve intersection capacities and construction of new ring roads in urban areas to improve the connectivity between main radial roads increase the overall network capacity in urban areas.

Development of high-mobility road network

Considering the major corridors of the network, five expressways were identified as an initial step by RDA. They are:

- i. Southern transport development project (Alternate highway from Colombo to Galle and Matara)
- ii. Colombo - Katunayaka expressway
- iii. Outer circular highway to the City of Colombo
- iv. Alternate highway from Colombo to Kandy
- v. Alternate highway from Katunayaka to Anuradhapura via Padeniya

These highway projects are in different stages of development as indicated below in the detailed of individual projects:

i. Southern transport development project

Because of the strategic importance to the country's political

stability and economic prospects, there is an immediate need for improving transportation to the southern region. The existing Colombo-Galle-Hambantota-Wellawaya Road (A2) provides the main link between Colombo and the Southern Province and is already heavily congested. Due to the heavy traffic on this highway, accidents are also very high.

According to the recent feasibility study of the extension to the southern highway reveals that the present rate of safety on the A2 road (Table 4) roughly translates to around 740 deaths per billion vehicle kms. This is around 3 times more than what is observable on international expressways. Thus, a 75% reduction in road safety may be assumed by constructing a standard expressway. However, such safety will only be possible if the road designs are in order. To achieve this, there should be adequate provision for road safety monitoring and enforcement.

The expressway has already been completed from Kottawa to

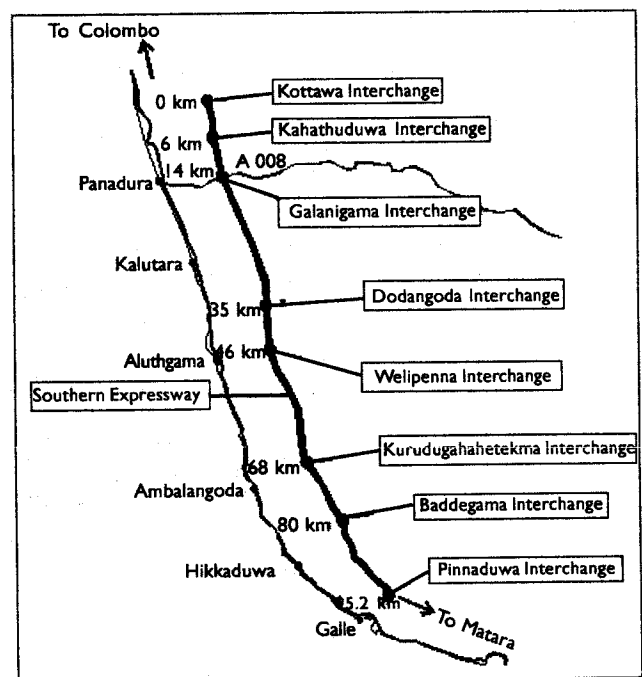


Figure 1 Interchanges of the southern expressway

Pinnaduwa (Galle) and was opened on 28th November 2011 for the traffic. The expressway starting from Kottawa-Makumbura on the Colombo-Ratnapura-Wellawaya-Batticaloa (A4) will traverse the hinterland areas of the Kalutara, Galle and Matara Districts and will end in Godagama on the Galle-Akuressa Road (A24). A new access road to Galle from the expressway has been constructed under the project. The total length of the Highway is 126.1 km. Interchangers will be the only points where traffic can enter. The interchange locations from Kottawa to Galle are shown in Figure 1.

The highway has been constructed with a 4-lane facility and land has been acquired for a 6-lane facility in future. Total estimated cost for the full 126,1 km length of the expressway is around Rs. 95.3 billion.

ii. **Colombo-Katunayaka expressway project**

The proposed expressway has a four-lane facility to cater to a design speed of 110 km/hr. This 25-km expressway has been provided with four interchanges at Peliyagoda, Kerawalapitiya, Jaela and Katunayaka. The Outer Circular Highway (OCH) has been connected to the expressway at Kerawalapitiya.

The construction cost of the project is around Rs. 32.0 billion and funding has been obtained from Exim Bank of China. The work is in progress at present according to the present construction programme and will be completed by the end 2012.

iii. **Outer Circular Highway (OCH) to the city of Colombo**

The outer circular highway which has been located approximately 20 km away from the city of Colombo has been identified to cater to increasing traffic demand, to minimise traffic congestion on the existing trunk roads radiating from the city and to

encourage regional development and a better balance in urban growth.

The project will be implemented in 3 phases, and the construction work of the phase 1 from Kottawa to Kaduwela has already been

started under Japanese funding. The procurement work for the phase 2 from Kaduwela to Kadawatha is in progress at present. This section also will be funded by Japan. The third section from Kadwatha to Kerawalapitiya is to be implemented on turnkey basis.

The highway will be constructed with a 4-lane facility initially, and land will be acquired for a 6-lane facility for future. The total estimated cost is around 84.4 billion rupees.

iv. **Alternate Colombo-Kandy highway**

With a view to overcome the serious traffic congestion on the existing Colombo-Kandy road (A1), it has been decided to construct a new limited access highway from Colombo to Kandy to promote economic development of the Central, North-Western and Eastern provinces of the country.

Table 5 Road lengths completed from 2005 to 2010

Year	Length completed (km)		
	Under Foreign Funds	Under Local Funds	Total
2005	59.70	238.89	298.59
2006	174.81	439.13	605.94
2007	202.14	124.60	326.74
2008	355.45	59.03	414.48
2009	1,008.33	280.00	1,187.66
2010	207.40	536.30	743.74
Total	2,007.83	1,677.95	3,577.15

Source: Road Development Authority.

Table 6 The existing sources of funding and selected road lengths for improvements

No	Funding source	Length under taken (km)
1	Asian Development Bank	373.5
2	French Funding	127.4
3	World Bank	134.3
4	Chinese Banks	991.8
5	JICA Japan	99.0
6	EDCF Korea	128.6
7	Local fund	450.0
	Total	1,931.1

Source: Road Development Authority.

With the feasibility study carried out in 2000/2001, a road corridor has been identified for this highway. The road corridor starts from Kadawatha (interchange with OCH), and it will pass close to Ganemulla, Gampaha, Ambepussa, Devalegama, Rambukkana, Hatharaliyadda and, Hedeniya, and end at Katugastota on Kandy-Jaffna road (A9). The total length of the corridor from Kadawatha to Katugastota is 98 km. There will be 10 tunnels for the highway of varying lengths from 30 m to 450 m. The highway will be constructed with a 4-lane facility in two stages. The first stage is from Kadawatha to Ambepussa, for a length of 48 km. Land acquisition work for the stage 1 is in progress at present.

v. **Katunayaka-Padeniya-Anuradhapura-Jaffna highway**

Presently, there are 3 ways of reaching Anuradhapura from Colombo varying from 168 km. to 204 km. in distance. The shortest

and the most common route is a combination of several B-class roads up to Padeniya and along an A-class road to Anuradhapura from there onwards.

A recent study revealed that the construction of an expressway starting from Katnayaka with link to Colombo- Katunayaka expressway is difficult task due to the expansion of Katunayake airport and the high level of land acquisition involved in the area. The expressway starting from Colombo-Kandy highway at Ambepussa or location close to that is more viable, and it can be linked to the expressway network to the eastern and the northern part of the country. This highway will start from Colombo-Kandy highway and pass between Kurunegala and Wariyapola and link to Dambulla. There onwards, it can be linked to Trincomalee, Anuradhapura and Jaffna.

iv. Extension of Southern Transport Development Project (STDP)

With the government initiative of the development of Hambantota as an international hub with Hambantota sea port and Mattala airport, there was a necessity to extend the southern transport development project to Hambantota to link these facilities to high-mobility network. The RDA has carried out a feasibility study and identified a trace of a 74-km length. This will be developed with a 4-lane facility initially and improved to 6 lanes later. The ground survey work for the identification of exact trace is in progress at present.

Major improvements to the existing national highway network

With the realisation of the requirement of rapid development of the existing network, government has launched accelerated

programme for the improvement of the existing network while investing on the above-mentioned high-mobility network. The completed highway projects in last five years, based on the RDA records, are given in Table 5.

There are several on-going improvement projects under different sources of funding and road lengths under these funds are given in Table 6.

The RDA has developed a National Road Master Plan (NRMP) for the development of national roads in 2007 covering the 10-year period from 2007 to 2017.

Some Thoughts for the future planning of highway improvements

Urban highway set up

The urban highways in Sri Lanka are well developed with often more than two-lane standards and with very good surfacing. Therefore, the riding quality is at an acceptable level. However, the major problem in our cities is the traffic congestion for several hours of the day. The reason is that a large number of vehicles use our urban road network for various reasons during different hours of the day. The limits of the highway capacities have always exceeded due to the above reason on these urban links at present. However, further expansion of the road widths are not possible with already developed building infrastructure beside the urban highways.

The reasons for the traffic congestion in urban areas are poor public transport supply, high income concentration to urban areas and high affordability of private vehicles, undesirable taxation policies for vehicle imports, affordable fuel charges,

undesirable taxation on fuel charges, friendly-procedure for obtaining driving licence and inefficient integration between public transportation (bus and railways).

Therefore, one main concern in traffic management in highly-congested urban roads is widening of the roads in urban areas. But this is not possible. The options that have been adopted in other developed countries are; improving public bus and railway transportation in urban areas as a national policy, restrictions of the usage of private motorised vehicles in congested areas by means of congestion pricing schemes, revision of the vehicle import policies, parking restrictions, increasing street parking fees and so forth. Most of these are in practice in Singapore and other developed countries and has been very successful at present and well contributed for high economic developments of such countries. What we have to think is that "We need people to the cities but not the vehicles that occupy valuable activity spaces of people".

Furthermore, we need to improve the urban highway infrastructure for improving the highway capacities by various ways to make sure that the required traffic flows to the cities are uninterrupted for future demands. Improvements to highway intersections, segregation and improvements to pedestrian facilities, parking control and facility designs are most important highway improvements in urban areas. Intersection capacities by improvements and review of traffic signals, grade separation with flyovers, channelisation at junctions and introduction of one-way traffic systems are some options. However, these should be implemented after very

comprehensive studies. Therefore, it is our responsibility to make use of the professional knowledge and integration always to make sure that we do the correct things to avoid the wastage of valuable resources for the economic development of the country.

High-mobility intercity road network

It is important to have a very good high-mobility intercity road network in the country to connect the main district capitals of the country. The initiatives have been already taken by the RDA to cater to this need. The above-mentioned expressways have been proposed, and they are at various stages of development from design to implementation. It is important to plan high-mobility network according to the economic development master plans for the entire country and to suit to the future demands between the main capital district centres in Sri Lanka. The already proposed expressways have covered only the Western, Central, and Southern provinces according to the present plans. However, there is an immediate need of having connectivity to the North, North Central and Eastern provinces to link this expressway network. Also, it is important to link Uva province to have an economic balance among different geography of the country to elevate the most suffering region by poverty.

Integration between highway and railway

Even though we have planned many highways and expressways, there was no thought of integrating them with railways. This is a very important aspect from the economic development of a country. It is very useful for the alleviation of the traffic congestion in urban areas by increasing the passenger and goods-carrying capacities by improving the

mass transportation modes as most developed countries are successful today. The railway must be the main and most economical way of mass transportation on the surface. It is important to increase the capacity of the mass transit systems by means of increased speed and frequency with low headways. Electrified trains, metro systems should be the solutions for railway infrastructure developments as long-lasting solutions, even though they are expensive and make short-term economic impacts to the country.

Conclusions

There is very positive thinking of the road agencies towards the development of the road sector. Measures have already been taken for planning and improving a significant length of expressways across the country. However, the integration of surface transportation, urban traffic management, equitable distribution of benefits, etc. have not been considered in the master plans as expected targets in the long term. Also more emphasis is needed for the evaluation of the cost effectiveness of the investments to meet the transportation needs of the country as a whole rather than trying to evaluating the highway sector alone. The passenger kilometres of a country is a better indicator of the sustainability of the transportation of that country for economic development rather than the vehicle kilometres that the people travel. Therefore, it is very useful to think how we can improve the economic activities by giving facilities for the labour force of Sri Lanka for their day-to-day transportation needs in an economically viable manner by integrating and making possible

improvements to the surface transportation of Sri Lanka.

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Traffic and Road Safety Management

Abstract

Improving road safety is getting more attention all over the world due to increase in number of road accidents and associated loss of lives and resources. Safety management concept is being promoted to achieve acceptable safety standards. Traffic management is considered one of the tools that can effectively be used to achieve improved safety standards.

Introduction

A road accident is defined as a collision of one or more vehicles resulted due to unexpected sequence of activities. When a road user perceives a possible hazard situation, he or she usually undertakes an evasive action. Those who fail to complete the evasive action(s) prior to reaching a point of no escape ended up with a collision. In a road environment, a collision is a result of deficiency between road user performance and system demand.

It is important to consider what is meant by "safety". The concept of safety is dependent on individual perspective. Though the traditional practice is the consideration of the number of accidents that occur as a measure of safety, it is not a reasonable measure as we cannot allow a defined number of accidents to happen before mitigating hazardous situations. Another measure that can be used is risk of meeting with an accident. There are two aspects to this concept. One is the risk for an individual of meeting with an accident and other is the risk that passing road user will generate an accident. As complete elimination of accident risks is an

impossible task, it is necessary to decide on an acceptable level for inherent risks. The number of accidents is a deterministic quantity and easy to measure. The risk of an accident is a probabilistic quantity and is difficult to be evaluated. Few tools are available to evaluate the level of risk of accidents at a given location. Another extreme measure that could be used is road user stress level. Road user stress level is a qualitative measure which is very subjective, but it can be considered as the correct representation of the acceptable level of safety for individuals.

Today, safety is considered as "management of risk" and is defined as the state in which the risk of harm to person or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.

The need for interventions

Ignoring safety hazards may lead to increase in the number of serious accidents. There is a need to manage accident risks on roads due to increasing trends in road accidents and enormous cost of road accidents that is estimated over 10 Billion Rupees per year that include vehicle and road furniture damages, medical costs

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and police and other administrative costs. Further, having no positive measures may lead to loss of confidence of road users.

The main objective of the safety management is to minimise unexpected situations encountered by road users that may result in a conflicting situation. As shown in Figure 1, user concentration level (performance) can change with time due to a number of reasons such as engaging in other activities such as tuning the radio on, looking at a road side advertisements or falling asleep. However, when a driver perceives a risk in the road environment, he/she would pay more attention and the performance curve can go up. At the meantime, the road environment has its own behaviour. When the road traffic is less or when there are no road-side obstructions or no road - side friction, environment

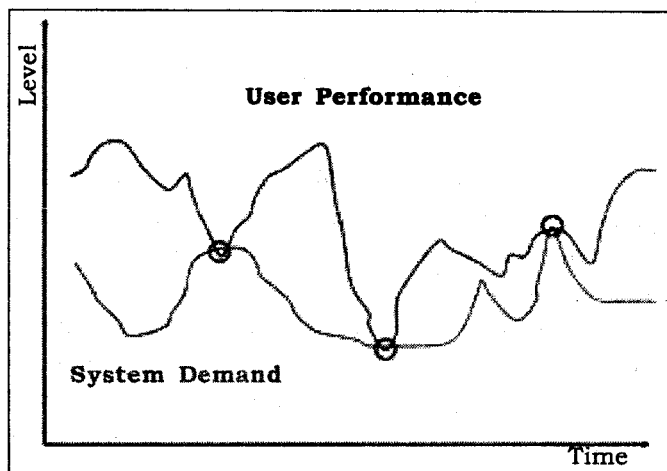


Figure 1 Cause of an accident

does not demand a higher user performance, and thus, the system demand curve will be low. Some situations such as damaged road surface, sudden pedestrian movement across the road or an unexpected manoeuvre of a nearby vehicle will increase the system demand. Whenever the user performance level falls below what the system demand from the road user, there can be an accident.

Based on the above explanations, there are two strategies to reduce traffic accidents; one to increase the driver performance level and other to reduce the system demand. Driver education, user knowledge about road rules, hierarchical levels of driver behaviour, law enforcement, physical and mental fitness and other fiscal policies such as insurance, fines, etc. have been identified as the factors influencing the user performance levels. Steps that are required to increase the user willingness to improve their performance levels and policy changes necessary as incentives for the road users to change their attitudes need to be identified. System demand can be reduced by proper vehicle design, correct intersection and highway design and maintenance practices.

The main elements involved in road accidents are the road user, the vehicle and the road environment. A somewhat loose parallel can be drawn between these and the host, agent and vector concept used in epidemiological studies. Therefore, the preventive mechanisms used in medical field can be applied to a road accident during pre-crash, crash and post-crash situations.

Traffic and safety management

Traffic management can be defined as the effective utilisation of available road space to improve traffic flow and safety. The main objectives of traffic management are to;

minimise delays, increase capacity, improve safety and security, give priority to selected traffic and minimise emissions. Safety management tools could be incorporated in the road development work and transport operations to improve the safety standards. This will result in minimising loss of human life, injuries, property damage and financial, environmental and societal losses. The need for managing transport demand arises mostly due to the rapidly increasing vehicle fleet in the world where the increase of motor vehicles often outstrips the provision of road space in many countries.

Safety management is a systematic process which increases the chances of reaching safety goals by ensuring that all opportunities to improve road safety are identified, considered, implemented as appropriate, and evaluated in all phases of highway planning, design, construction, maintenance, and operations. The level of attention to the safety measures should be decided based on the three risk elements; the probability of accidents, the level of exposure and the magnitude of the consequences. Maintaining an acceptable level of risk can be

achieved through safety performance indicators and safety performance targets.

Safety management could be implemented through safety programmes and safety management system. A safety program is an integrated set of regulations and activities aimed at improving safety. A safety program has a broad scope and includes many activities aimed at achieving the program objectives. A safety management system is an organised approach to managing safety. It usually includes necessary organisational structures, accountabilities, policies and procedures.

Approaches to traffic management

Traffic can be managed through engineering design, through enforcement and through education.

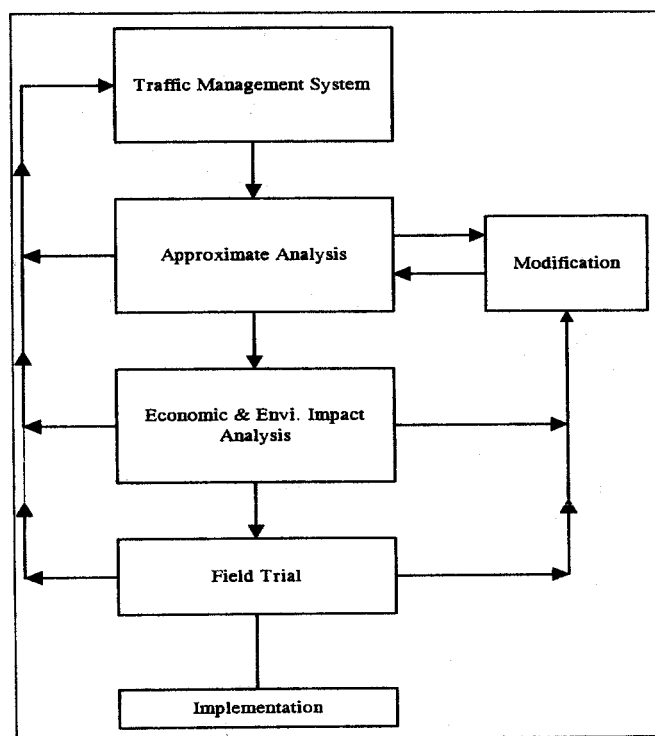


Figure 2 A flow diagram of evaluating a traffic management plan

Design includes; intersection designs, medians, islands, cycle paths, pedestrian paths/ malls, bus bays/ parking bays, street lighting, road geometry, road surface and drains.

Enforcement can be either manual or physical. Manual controlling consists of parking control, land use control, speed control and turn prohibition. Physical controlling includes road signs, lane markings, barriers, pedestrian crossings, one-way roads and road closure. Education includes, driver training, training schoolchildren, advanced training of professional drivers, public awareness and public participation.

Any traffic management system should be properly evaluated before implementation. The following methodology (Figure 2) could be used to ensure the effectiveness of any traffic management system. A sound knowledge in traffic engineering theories is required for the approximate analysis.

Evaluating mitigation options

All risk mitigation measures may not have the same potential for reducing risk. Therefore, it is necessary to evaluate options available prior to implementation. These options could be evaluated with respect to effectiveness, cost/benefit, practicality, challenges and acceptability, enforceability, durability, residual risk and possible new problems. Preference should be given to the measures that could contribute most towards eliminating risk.

Road design

Proper road design is vital for the success of effective traffic management. Road Safety Audit is one of the tools that could be used to improve the safety standards of a road

design. Road safety audit is a formal and independent review of a proposed design by an expert safety team to assess the multi-modal safety performance of the design.

The main objectives of carrying out a road safety audit are to reduce the whole of life costs of the project, minimise post-construction remedial work, consider the safety of all road users, minimise preventable collision-producing elements, provide injury-reducing elements at suitable locations, include suitable collision-reducing elements and ensure the project does not impact safety on adjacent roads.

A report identifying any safety concerns with the design, quantifying the safety implications of the relevant design decisions, and suggesting safer alternatives for consideration will be an outcome of a road safety audit. The responsibility of the safety team is making documented recommendations. Then the design team gets an opportunity to outlining how the safety recommendations are being addressed.

When using design standards, steps should be taken to evaluate the desirable vs. minimum standards. Further, the combination of standards may contribute towards conflicting situations with respect to safety. Age of the standards is another factor that should be considered in road designs.

Safety during the operation stage

During the operation stage "traffic conflict study" technique could be

used to evaluate the safety condition at a given location within a short period of time. Here, it is assumed that the serious conflicts are proportional to the type of traffic accidents, and the identification of conflicts can be used to understand the potential safety issues without waiting for accidents to happen.

Based on the results of conflicts studies, one can identify the appropriate traffic management options for a given location. However, it is important to monitor and evaluate any traffic management option to be implemented as residual problems could arise due to unexpected and random behaviour of road users.

Conclusion

Road safety management system is a useful tool to improve the road safety standards. Success of a safety management system will depend on the attitude of the management towards safety, safety cultures developed within organisations, reporting, analysing, training and monitoring mechanisms used in handling safety. Understanding traffic flow behaviour and knowledge on traffic management measures are required for the successful implementation of road safety management system.

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Reduction of Traffic Congestion in Colombo City by Improving Public Bus Transport

Abstract

The motorisation within Colombo city has increased with the increase of travel demand as many people refrained from using public transport mainly due to its inefficiency and poor quality. However, the increased motorisation has led to many negative implications such as congestion, environmental pollution, road accidents, etc. Thus introduction of an efficient and high-quality public transport system capable of attracting private vehicle users has become an urgent need. This paper examines prevailing passenger transport demand, drawbacks and viable improvements required to the existing public bus transport in Colombo city.

Colombo City and its Transport System

Colombo is the largest city with an area of 37 km² and commercial capital of Sri Lanka with a city population of 647,100. Although the city limits are defined by the Colombo Municipal Council (CMC) boundary, its economic activities spread over Greater Colombo area which extends Kadawatha in the north, Kaduwela in the west and Moratuwa in the south.

It is also the centre of the economy in Sri Lanka as the major government and private offices, factories, hospitals, hotels, schools and a harbour are located within the city inducing a large daily regular travel demand towards the city. It also attracts a large number of irregular travellers since it links all parts of the country by keeping country's major road and rail passenger transport node within the centre of the city. Therefore, most of the passengers travelling

between the western part and the rest of the country have at least to touch the Colombo city in their journeys.

Colombo has an extensive public transport system based on buses. The bus service is operated by both private and government-owned Sri Lanka Transport Board (SLTB). Train transport within the city is limited, carrying mere 10% of trips, since most trains are meant for transport to and from the city rather than within the city and are often over crowded. The central bus stand and the Fort railway station function as the island's primary hub for bus and rail transport respectively. Other means of transport includes three wheelers and taxi cabs. Three wheelers are entirely operated by individuals while cab services are run by private companies and are metered.

Travel Demand Management

There are 10 major entry corridors to Colombo city. An estimated number of 750,000 people arrive in the city by road in 200,000 vehicles daily. Of these, 11,000 are buses and 15,000 are goods vehicles. Presently, around 15% of the road space is utilised for bus transport even though it transports 62% of road passengers.

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On the other hand, 65% of the road space is used by private and hired vehicles which carry only 38% of the passengers¹. Figure 1 shows the composition of city entry traffic flow and passenger share of each vehicle type.

All city entry corridors experience two major traffic peaks in the morning and afternoon. Obviously, school trips and work trips and jointly create the morning peak during 7.30 am to 8.30 am towards the direction of the city while the return school trips and work trips create congestion towards city outbound direction during 1.30 pm to 2.30 pm and 4.30 pm to 5.30 pm respectively. Typical representation of traffic flow on Colombo-Negombo is shown in Figure 2.

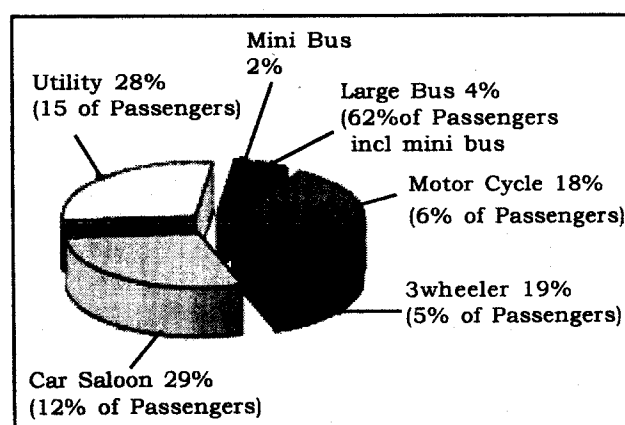


Figure 1 Vehicle composition and passenger share of each vehicle type at Colombo Municipal Cordon

Figure 2 clearly illustrates that the peak period congestion is purely created by private passenger vehicles such as motor cycles, three wheelers, cars and vans as their flow is always close to the total vehicle flow during the day. Therefore, congestion management should focus on reducing passenger vehicle entry to the city or else providing an adequate road way capacity for them.

Road capacity improvement is always a popular solution for mitigating traffic congestion. However, the road infrastructure in Colombo city and its suburbs cannot be further widened or new roads cannot be built to match with the rate of demand created by people who are shifting from public transport to private transport. The inability to obtain the required land for road space, parking spaces, etc. are fast becoming constraints, severely restricting the flow of vehicles exceeding the capacity of the road system. As a result, around 70% of the length of the national roads within the 10 km radius from the city centre is congested throughout the day.

Although restricting and discouraging using private vehicles especially during peak hours are considered as effective measures in traffic demand management, such intervention would not become popular unless good public transport system is ensured in the first place. Improvement of service quality of public transport would be another measure for attracting private vehicle users as they like to pay for their comfort. However, poor operational features associated with public bus transport at present will not encourage such modal shift.

Present Status of Public Bus Services

Colombo city is served by provincial and inter-provincial bus services operated by private- and State-sector buses. Individual operators in the private sector provide inter-provincial and intra-provincial services under the supervision of National Transport

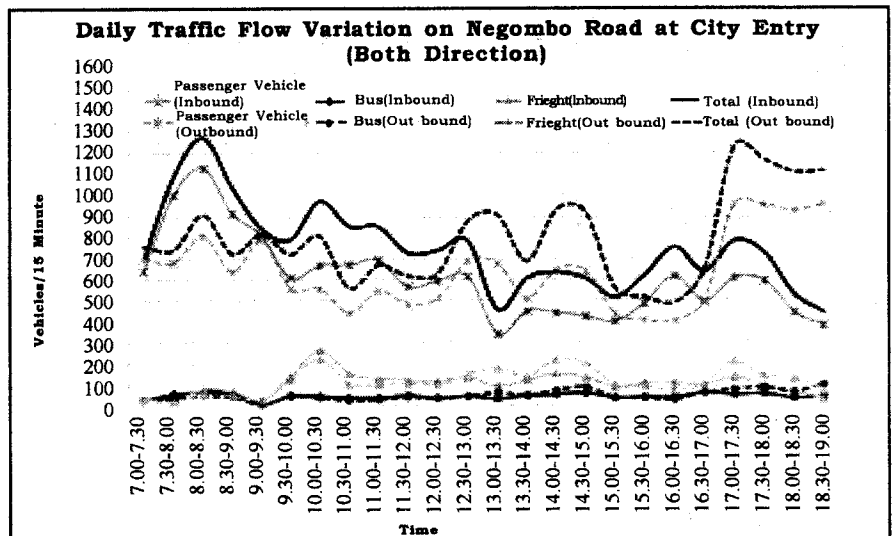


Figure 2 Traffic flow variation along Parliament road

Commission and Western Province Passenger Transport Authority respectively. The Sri Lanka Transport Board functions as the State-sector operator and provides both types of services.

The following key weaknesses associated with the public bus transport at present make the people to go away from it:

i. Overloading and lingering:

Although the operators tends to move from low-occupancy buses to high-occupancy buses during the last few decades, still both private and public sector operators have not been able to handle the growing travel demand, especially during the peak periods of the day. As indicated in Figure 3, the load factor (demand/supply) of public buses operating on major city corridors stay above 1 for most part of the day and exceeds 1.5 during the peak periods.

In addition to the demand increase, highly profit-seeking behaviour of the private-sector operators has made them to overcrowd their buses in each trip creating unpleasant experiences for the passengers. Overcrowding generally occurs at intermediate bus stops resulting in delaying journey unnecessarily. Thus, increasing passenger carrying capacity would not become effective

unless it is supported by proper regulatory and monitoring framework.

ii. Inefficient orientation of city services:

At present, buses from 166 of inter-provincial routes and 98 of intra-provincial routes enter the Fort and Pettah area daily. Among 98 intra-provincial bus services, 95 uses the bus stands in Fort and Pettah area as their one end of the route while other three routes just touching the area. Arrangement of intra-provincial bus service in Colombo city is illustrated in Figure 4.

Both inter- and intra-provincial bus routes within the city limits are arranged in a radial network concentrated towards the Fort and Pettah area. Such arrangement leads to overlapping of a number of routes on a single corridor, particularly close to the city centre. Overlapping of routes reduces the overall efficiency of the network and also increases the traffic congestion while leading to higher fuel consumption and emission especially during the peak periods.

iii. Detouring for passengers: As mentioned earlier, orientation of the bus routes within the Colombo city is almost a radial network with minimum distributional routes. Sixty six (66) routes are operated between Fort/Pettah and out of

Colombo while only 2 routes between Fort / Pettah area and rest of Colombo Municipal Area. As a result, trip length and the travel time of bus passengers increase compared to the private vehicle users since, most of the time, bus passengers have to travel up to city centre to transfer to a bus which runs to their anticipated destination. The increase of trip length of bus passengers also causes overcrowding of the buses as the passengers have to occupy the buses for a longer duration until they reach their destination.

iv. Poor integration between long-distance and short-distance services: Generally, inter-provincial services do not intend to serve city while they are carrying passengers from outside of the province to the major terminals in Pettah and Fort. On the other hand, there are no proper transfer points to get their transfers to city service along the major corridors on which long distance services are operating. Therefore, such travellers coming outside also have to travel up to city centre or a near-by city centre to transfer to a city service.

Besides long distance bus services, rail also carries distant passengers from outside the city. None of railway station, at present, has been linked properly with a bus terminal to provide convenient transfer to a city service. Therefore, most of passengers, especially travelling on Puttalam and Kandy rail lines have used to come to Maradana and Pettah stations all the way in their journeys. Even the southern railway line passengers cannot have an easy transfer to a city bus service until they reach a near-by

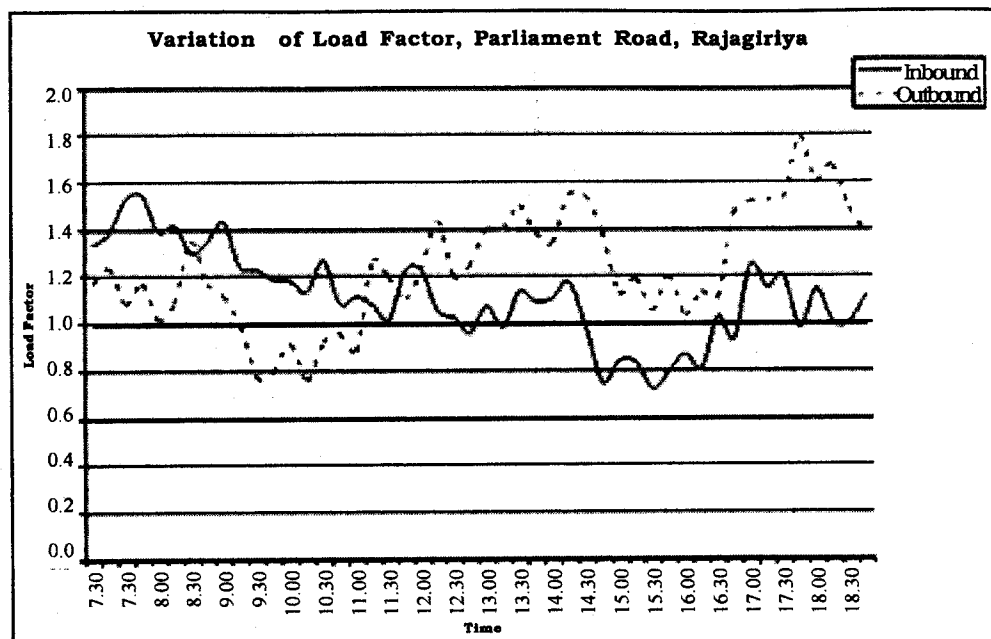


Figure 3 Typical variation of load factor at Rajagiriya on Parliament road

city centre stations such as Bambalapitiya or Kollupitiya as there is no any other close-by bus terminal before then.

Bus and rail passenger interviews conducted by the University of Moratuwa (UoM) in 2007 reveals that the intention of 43.2% of bus passengers and 46.9% of rail passengers arriving in terminals in Fort and Pettah is to transfer to local services as there is no proper integration of long distance bus and rail services with city services at any other bus and rail terminals within city limits.

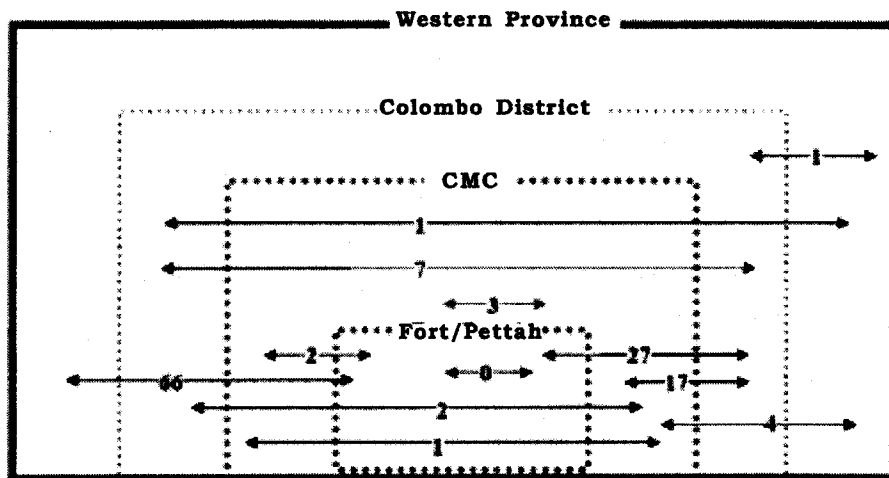
In addition, transfer from one long-distance service to another is frequently happening at Fort and Pettah since inter-provincial services are also concentrated in the terminals in Colombo city centre. Therefore, a large number of passengers unnecessarily enter the city merely for the purpose of continuing their trips. The same interview conducted by UoM reveals that 53% of bus passengers and 37% of rail passengers come to Fort/Pettah with the intention of transferring to a bus going out of the Western Province. It reveals that there is a demand to decentralise long-distance bus services.

v. Poor service delivery: Besides overloading, the other key factor which takes high income group of passengers away from public bus transport is mental and other physical harassment inside the buses. The discipline-lacked bus crew often used to talk to passengers by harsh words and also they try to manipulate standees viciously. Noisy environment, abrupt breaking and turning also fed up the passengers enormously. Further, road revenue conflict among operators adds higher degree of contribution for the traffic congestion and accidents as well.

Measures for Improvement

Due to the continuous deterioration of the quality of public transport during the last few decades, it has been noticed that more and more passengers have been shifting from public modes to private modes and also some of them have been migrating to the city proximity to minimise the use of public transport for their travelling purposes. Such tendency has caused increasing the private vehicle fleet and the cost of living of people residing in Colombo

Due to the high quality of the service, operator has to charge higher fare than that for other public transport modes. As a result of higher fare, these services would not be able to capture the working population who are using public transport mode at present. A survey conducted covering several institutes in Colombo city revealed that, though present public transport users are interested in premium service, their "willingness



Overflow parks should also be developed in parallel to the development of bus terminals.

iv. Improvements to service delivery: Operational and non-operational interventions are required to improve the services. Introducing timetables which

eliminates road revenue conflict and unnecessary lingering at intermediate terminals and stops is a priority at present as an intervention for improving operational aspects of the public bus transport. For the effective functionality of such timetabling program, it is necessary to strengthen the prevailing regulatory and monitoring framework also. Further, introduction of high-capacity, buses for city services will also improve the operational quality of the services. Generally, now operators tend to shift to high-capacity buses as a result of relaxed taxation policy and concessions on high-capacity buses.

Training of bus crew for improving their public relation capabilities and professional skills are currently in progress with the National Transport Commission for inter-provincial buses. But, it needs to be strengthened to benefit the crews in intra-provincial services as well. As a part of this program, a code of ethics for bus operators is also needed to be introduced.

Long-term interventions

i. Re-planning of bus route network: As the Colombo city and its suburbs have undergone a significant land use changes during the last few decades, it is necessary to re-plan the existing bus route network to cater to the resulting change in passenger demands. Although, introduction of minor modification to the network for catering to the localised demand variations can be fairly effective in the short term, it is essential to conduct a total network analysis leading to complete revision to improve the performance of the overall network in medium to long-term basis. Such re-routing program should focus on the following aspects:

i. Minimising transfers by providing direct routes connecting potential trip generators and attractors

ii. Designing several city by-pass routes to minimise transfers at the city centre

iii. Minimising the number of overlapping routes to avoid congestion on city corridors

iv. Increasing the number of cross routes connecting to radial routes to make travel distance shorter and consequently to minimise travel time of passengers

v. Related infrastructure developments such as bus terminals and stops

vi. For the success of bus route re-planning, it is essential to assign required level of passenger carrying capacity and prepare fine-tuned time schedule for the services.

As route network revision is almost a planning and administrative intervention, it needs only a minimum level of financial investment.

ii. Bus Rapid Transit: Bus Rapid Transit (BRT) is a high-quality bus-based transit system that delivers fast, comfortable and cost-effective urban mobility through the provision of segregated right-of-way infra-structure, rapid and frequent operations, and excellence in marketing and customer service. BRT essentially emulates the performance and amenity characteristics of a modern rail-based transit system but at a fraction of the cost. A BRT system will typically cost 4 to 20 times less than a light rail transit (LRT) system and 10 to 100 times less than a metro system².

BRT needs to be operated in-between potential trip generator and attractors, and hence, operating such services from just outside the city and drive towards commercial and administrative centres within the city would be worthwhile. Therefore, services connecting Kadawatha, Pandaura, Maharagama to Fort/Pettah and Battaramulla would be appropriate. However, planning a BRT network should be carefully handled with proper assessment of passenger demand and ability to acquire dedicated right-of-way for the operation.

iii. Developing public transport services with Park and Ride:

Park and Ride system allows people to park their vehicles and switch to the public transport. BRT and re-routing should become more effective as they are coupled with Park and Ride System. Such park and ride systems should be promoted outside the city where BRT and other major bus routes are started.

Conclusions

The poor performance of the public bus transport has become a major reason for traffic congestion during peak hours in Colombo city. The orientation of bus route network does not match with the passenger desires, and hence, leads to waste of thousands of man hours besides excessive use of infrastructure and limited resources such as fuel. In addition, poor quality of service delivery also takes people away from public transport and shifts them towards private transport modes. Such shortcomings associated with public bus transport can be eliminated effectively through several short-term and long-term interventions.

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Footnotes

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² Bus Rapid Transit Planning Guide, Institute for Transportation and Development Policy, USA, 2007.

Improvement of the Inland Freight Transportation of Sri Lanka

Introduction

The total volume of freight in Sri Lanka in the year 2010 included 109.431 million tonnes of agricultural produce, 6.2 million tonnes of industrial outputs which are exported and 20.4 million tonnes of imported commodities (motor vehicles and other commodities)¹. Ninety eight percent of this freight uses the road network while only 0.8% uses the railways. Coastal shipping accounts for the balance. The average per capita freight in the year 2010 was 6.2 tonnes. The per capita consumption of all commodities has increased from 3.1 tonnes in the year 2000 to 6.2 tonnes in 2010. The mid-year population in the year 2010 was 20.6 million with Gross Domestic Product (GDP) per capita of US\$ 2,399². The freight transport demand is determined by the surplus of production in a given region and consumption items which are not produced within the same region. The total freight flow consists of surplus production in a given geographical area and the consumption items coming from other regions. A macro-economic forecast of the country has indicated that per capita GDP will be doubled (i.e., US \$ 4,500) in 2015 with the expansion of the economy by

increasing total investment from 25% of the GDP to 34% during next three years³. The investment in sectors such as tourism, transport (airports, seaports, roads and railways) and housing will be increased by 9% to 10%. These growth provide a path for 10% to 16% high growth in the construction sector. Further, the demand for inputs from the manufacturing sector and its outputs will also increase. These development activities will influence to have high freight flow. Empirical studies on supply chain in Sri Lanka show that the growth of freight flow is always 4% to 5% higher than the growth of GDP⁴. This implies that if the Sri Lankan economy sustained a GDP growth of 8% per annum during next five years, the freight flow will expand by a minimum of 12% per annum.

Salient Features of Freight Transportation Market

The total freight flow of the island in the year 2011 was estimated at 129.831 million tonnes. Annually, 2.9 million tonnes of rice, the main food item of the Sri Lankan population is produced and

consumed within the country. The main export product, in weight, is Tea. It amounted to 331,000 tonnes in the year 2010. The freight transport originated in the commodity-producing regions and transporting to regions or nodes for consumption or export is called freight flow. It was found that 99% of

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this freight flow of the country uses the road network. The high-demanding regions are those with high population such as Colombo, Gampaha and Kandy. Studies show that tea, rubber, and coconut-producing districts are not doing value addition and packaging in the same locality, but are transporting bulk to other locations of other regions. Most of these activities are located in the Industrial Zone in Katunayake in the north of Colombo. The theory of transport is that transporters choose the shortest path for freight transport. But, it was found that 60% of consumption items coming to the western province of the country is not using the shortest path. The total freight volume coming from other region to the western province is 77,899 million tonnes. This includes the all imports of raw material and consumer items. The active truck fleet of the country as at June, 2011 is 162,000 of which approximately 65,000 trucks are 2-axel or more. There was a rapid growth in the active truck fleet since 2009 as shown in Figure 1.

Total consumption of the country amounted to 30.158 million tonnes of all food items, and 3.4 million betel leaves, 39,412 oranges, 132,000 mangoes, 41,000 bread fruits, and 41,425 pineapples in 2009/10⁵. The regional distribution of consumption (weight of all items other than fruits) shows a high freight flow to and from the Western province of the country (Table 1).

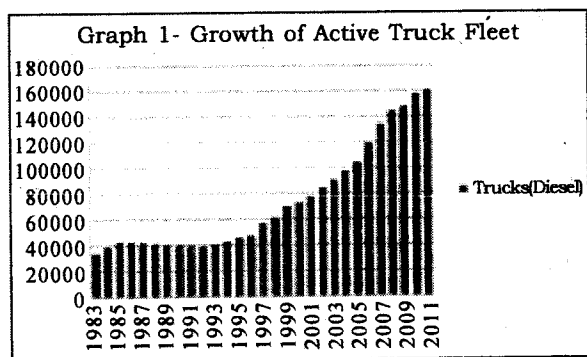


Figure 1 Growth of active truck fleet from 1983 to 2011 in Sri Lanka

Source: Revenue Licence Data from District Level and Author's Calculation

As shown in Table 1, only 20% of consumption was in the Western province while 60% freight flow was originated or passing through the Western province. The main export earning of the island was from apparel industry which amounted to US\$ 3.5 billion. The apparel industry acquires most of its input as imported raw material and makes 60% value addition to them. Large majority of these raw materials are being transported to the factories located in regions which are located out side the Western province, and finished products are brought back for packaging and export through the Port of Colombo. The second highest export commodity is tea which also has its value addition and packaging in the Western province and is exported through Colombo sea port.

Growth of Freight Market with Economic Growth

The economic growth of a country has very high correlation with freight. The correlation between growth of GDP and growth of freight flow for Sri Lanka is shown in Table 2. The correlation coefficient between the GDP growth and growth of freight flow was estimated at 0.967.

It was found that the total freight flow of 24 commodities including consumer and production items of the country is 8,828 billion tonne kms in 2011. This freight flow has generated a considerable truck kms as shown in Table 3.

The medium-term economic development plan of the government envisages the expansion of exports, construction industry and agriculture production. The importation of consumption items and raw material for the following development activities has targeted at 6%-9% growth during the next five years:

- i. Construction of 45,000 new room capacity for the tourist industry

ii. Investment of Rs. 200 billion annually on road construction

iii. Investment of Rs. 100 billion on the construction of urban housing

iv. Development of Sri Lanka as the port and aviation services hub in the region for value addition and processing

v. Investment on special industrial zones such as Trincomalee and Hambantota

vi. Development of Sri Lanka as a high-end tourist destination during next four years.

This economic development scenario of the government may increase the total freight flow by average of 14% per annum. There may be instances of short-term growth of the total freight flow by 20% in some years. The construction of new roads generates more traffic by

increasing travel demand due to the diversion of the existing traffic from other routes.⁷ Thus, with the opening of the Southern expressway in this

year may generate new traffic and may also shift the rail freight on the coastline to the road. This has to be monitored to identify transport strategies to minimise freight cost.

This will increase the freight flow by about 14% annually with short-term increase of 20% for next three years with the boom of investment on construction. Further, by the end of this year, 115 kms of express

way will be opened for traffic which has an impact on generating additional truck kms, shifting traffic from other modes such as railways and coastal shipping.

Table 4 clearly illustrates that 57% of trucks fall into the small lorry (LGV) category and only 43% are medium and large truck category within the Colombo area. Therefore, this traffic highly contributes to urban traffic congestion. The freight transport should not contribute to congestion, accidents and inefficiency on the usage of the urban road network. Therefore, considering the fact that freight transport is the backbone of economy, an alternative mode has to be mobilised with necessary infrastructure, if the country is aiming at achieving its economic growth targets.

Table 1 Total consumption by districts (all commodities in tonnes)

District	Weight (t)	District	Weight (t)
Colombo	3,110,352	12. Batticaloa	714,204
Gampaha	2,834,532	13. Ampara	1,038,912
Kalutara	1,653,582	14. Trincomalee	542,198
Kandy	2,059,281	15. Kurunagala	2,542,545
Matale	785,669	16. Puttalam	1,046,257
Nuwara Eliya	1,248,472	17. Anuradhapura	1,373,979
Galle	1,586,131	18. Polonnaruwa	738,024
Matara	1,357,448	19. Badulla	1,504,362
Hambantota	1,071,198	20. Monaragala	867,885
Jaffna	634,445	21. Ratnapura	2,000,334
Vavuniya	197,162	22. Kegalle	1,252,092

Source: Household Income and Expenditure Survey (HIES), 2009/2010, Department of Census and Statistics, Sri Lanka

Impediments to the Freight Transportation and Inter-modalism⁸

A review of government policies and strategies indicates that impediments for the supply chain process have not been addressed in the government policy framework. This was the case during the last two decades too. Therefore, it was disadvantageous for our products to fetch a

Table 2 GDP* (in '000 US \$) and freight flow ('000 tonnes) from 1982 to 2010 in Sri Lanka

Year	GDP US \$	Freight Flow	Year	GDP US \$	Freight Flow
1982	4,768,765	24,864	1997	15,091,930	59,043
1983	5,167,913	25,032	1998	15,794,972	69,424
1984	6,043,474	26,002	1999	15,656,342	68,043
1985	5,978,460	29,456	2000	16,330,810	76,239
1986	6,405,210	31,976	2001	15,746,224	67,043
1987	6,682,167	34,182	2002	17,102,623	79,760
1988	6,978,371	33,764	2003	18,881,765	81,243
1989	6,987,267	32,602	2004	20,662,525	87,237
1990	8,032,552	35,980	2005	24,405,791	95,870
1991	9,000,362	36,705	2006	28,281,012	110,340
1992	9,703,011	37,870	2007	32,357,034	120,765
1993	10,338,679	39,508	2008	40,714,178	107,150
1994	11,717,604	42,424	2009	42,065,425	102,904
1995	13,029,697	43,809	2010	49,548,912	97,427
1996	13,897,738	47,645			

Source: CBSL, Sri Lanka and Author's Calculation on Freight Flow based on data from Department of Census and Statistics

competitive price in the global market and to reach the market at appropriate time.

transportation systems in Europe and the USA making their exports highly competitiveness in both

the supply chain depending on the transport cost and reliability. A low-cost supply chain of freight transport has been developed with inter-modal freight

dry ports/logistics centres have illustrated the reduction of traffic congestion in urban roads due to freight traffic originated at sea and air ports by reducing the fees and charges on shippers for the freight transport.

There is a stimulated package or road map to develop freight transportation supply chain which has to be evolved with inter-modal transportation. This has been recognised by the National Transport Policy of 2009⁹. However, current projects and programs of the transport sector are not in line with those mentioned in this policy document. Further, it is observed that comprehensive transport strategies indicated in the "*Mahinda Chinthana Idiri Dakma*" policy document have not been

Table 3 Operated truck kms, freight in '000 tonnes and operated freight tonne kms from 2007 to 2010

Description	2007	2008	2009	2010
Operated truck/lorry kms	1,410,904,656	1,290,964,752	1,277,377,868	1,209,393,793
Freight volume (tonnes)	120,764,620	107,150,074	102,904,058	97,427,341
Freight flow (tonne kms)	7,728,935,706	7,071,904,911	6,997,475,958	6,625,059,197

Source: Author's calculation based on traffic data, fuel consumption and data on production and consumption of Department of Census and Statistics

The key issue of the freight transport is the use of roads for 99% of the freight and the rail mode only for 1%. This has contributed to urban traffic congestion and road damages as a result of over loading of 2-axel vehicles. All Sri Lankan roads are having a designed axel- load capacity to allow transport of freight vehicles. The trucks used by the freight transporters in the country are overloading without adhering to the specified axel load designed by the truck or lorry manufacturers causing damages to roads. This is an "inefficient" and "un-economical" use of roads. The overloading can be observed in the majority of small and 2-axel trucks. The import duty and other taxes applicable for the importation of trucks do not encourage the multi-axel trucks to be imported by the freight industry. This impediment has been removed by the budget proposal of 2012.

The inter-modal transport means the integrating all modes of transport in

global and local markets. Sri Lanka has not considered this as a key priority area, other than Sri Lanka the Sri Lanka Ports Authority which is looking for container yard for their functions. The land transport authorities have left freight transport completely to decide by the market forces and, even up to now, any economic tool or instruments have not been used with a clear vision to develop freight transport in the country.

The Asian Development Bank has provided some technical assistance to identify and develop a concept of logistic centre, but it does not match with the country's economic development program. The impediments for freight transportation have to be comprehensively addressed considering the needs of a low-middle-income country. The Dubai

taken into consideration in any implementation programs of the transport sector due to high concentration on micro operational aspects ¹⁰such as routine maintenance of government own buses.

Main Issues of the Freight Transportation in the Island

The main issue related to the freight transport in Sri Lanka has been identified through the analysis of mode of transport, origin, destination, axel loads, fleet characteristics, regulatory regimes and demand for freight transport. The main issues are:

- The total freight transport market has grown by 7.5% during the last ten years. The road haulage has accounted for 99% and the share of railway has been less than 1% of the freight market

which resulted in increasing the transport cost.

ii. Unguided investment on supply chain infrastructure such as warehouses, processing centres, and container depots

global market and will reduce the wastage of resources thereby reduces the prices. This analysis of the freight transportation system in Sri Lanka makes the following recommendations, if the

economic development of any country. The vision of the government of Sri Lanka to double its per capita GDP by 2015, from US\$ 2,399 to US\$ 4,500 may not be materialised if an appropriate freight transport system is not

Table 4 Contribution to urban traffic congestion by the freight transport in Colombo city

Station	Car	Light goods vehicle	Bus	Medium capacity lorry	Large bus	3 Wheels	Medium and large trucks
Mattakkuliya	2,244	1,032	38	3,070	11	2,541	88
Japan-Sri Lanka Friendship Bridge	10,482	5,132	718	8,626	2,606	9,371	7,689
New Kelani Bridge	31,704	17,518	2,356	19,290	7,841	12,139	15,258
Sri Lanka Land Reclamation and Development Corporation	47,295	10,038	330	17,501	330	14,407	4,444
Wellampitiya Bridge	3,392	2,153	278	6,797	2,076	8,505	3,278
Kirulapone Bridge	27,849	6,292	362	13,422	4,094	11,854	3,136
Near Ayurveda Hospital	7,351	3,752	858	6,819	5,053	7,235	2,195
Pamankada Bridge	21,075	5,206	530	9,244	1,502	9,084	4,799
Dehiwala Bridge	30,639	8,342	1,350	11,699	5,378	16,572	1,448

Source: Primary data from RDA and author's calculation

iii. The growth of economically inefficient rolling stocks of road freight transport, where 57% of road truck fleet is small truck and only 38% is medium and large trucks.

iv. Non-availability of economic instruments to invest on supply chain infrastructure by the private sector as no clear policy interventions have been evolved by the policymakers.

v. Ad-hoc regulatory regimes by several institutions including the Department of Motor Traffic, Department of Police, etc.

vi. Non-growth of third party suppliers of freight transport because there is no organised structure due to non-identification of the importance of the role of third party suppliers within the supply chain by the policymakers

vii. Overloading of trucks, specially two-axel trucks and use of roads sections by some trucks which are not designed for heavy loads.

Making a Competitive Freight Transport System

Efficient freight transportation system will create high competitiveness for exports in the

economic development targets of the government are to be achieved:

i. Revise tax structure for the importation of freight transport equipment such as prime movers, lorry and trucks. This revision should be based on the productivity of the transport equipment, road damages caused by such vehicles, and the cost of a consignment.

ii. Identify and designate appropriate locations of areas for establishing logistic centres close to railways, roads, seaports and airports.

iii. Reform the land use policy by integrating the Colombo outer circular road, rail network and highways for freight transportation nodes to minimise the cost to the country.

iv. Identify and incorporate technical inputs and toolss on specifications for trucks and their norms for freight transportation in the Island.

Conclusion

The efficiency and effectiveness of a freight transport system is a fundamental requirement for

developed. The experience of the countries which have achieved rapid development shows that development of freight transport systems is a high priority area in their economic development plans.

Footnotes

¹ Department of Customs, Department of Census and Statistics and Author's calculation

² Annual report, 2010, Central Bank of Sri Lanka

³ Budget Speech , 2011

⁴ Cook Peter, "Supply Chain Study for Sri Lanka", US-Aid study, September, 2007, Page 21.

⁵ Household Income and Expenditure Survey (HIES), 2009/2010, Department of Census and Statistics, Sri Lanka

⁶ Current Prices

⁷ McDonald, Jhon F, d'Ouvill, Edmond, and Liu, Louie Nan- "Economic of Urban Highway Congestion Pricing"-Kluwer Academic Publishers, Boston/Dordrecht/ London, 1999

⁸ Interconnected different mode of transportation

⁹ The National Policy for Transport Sector - Ministry of Transport - Presented at Parliament on September, 2009

¹⁰ Manifesto , 2010 Presidential Election "MAHINDA CHINTHANA IDIRI DAKMA", January, 2010

Enhancing the Efficiency of the Sri Lanka Railways and its Contribution to Transportation

Introduction

The national highways network of Sri Lanka has heavily congested with increasing both vehicle population and the demand for transport services. Due to the traffic congestion caused by heavy vehicles such as prime movers, large trucks and passenger transport busses, school, office and factory staff transports are also getting delayed resulting in a waste of a huge number of man-hours, daily. But the room for further expansion of highway transport, particularly in the developed and urbanised areas, is limited due to the huge financial and social costs involved with the required acquisition of valuable assets and the compensation payable for them.

In contrast to highways, the use of railways gives huge economical, social and environmental benefits and savings for a country. Globally, next to transport by water, railways is the second least-cost mode of transport of passengers and goods in terms of labour requirement, fuel consumption and other expenses.

Our neighbour, India, can be considered as a country which reaps the maximum benefits of railway transport. But, even in India, the passenger transport sector is operated at levels below the breakeven, but due to the surpluses in the goods transport sector, the overall railway transport system is making profits.

At the same time, a large number of developed countries are in the process of substituting air transport with rail transport, and such efforts are generating positive results. Railways are competing with air transport to enhance revenue by various measures such as exceeding the speed of land transport above 350 km per hour, providing comparable on-board luxuries and railway tickets at prices many times below the air tickets for a similar distance. Accordingly, countries such as Japan, United Kingdom, France, China and United States of America have launched high-speed (bullet) trains.

A power-set with 06 wagons can transport 1,800 passengers. The fuel consumption for that will be around 04 litres per km. The fuel consumption of a passenger transport bus will be around 0.2 litres per km. Accordingly, a train consumes 200 litres of fuel for a 50 km journey, while a bus needs 10 litres for a similar distance. But, to transport 1,800 passengers, 30 busses (1,800/60) and 300 litres of fuel (30*10) will be required. The man-power requirement for 30 busses will be 60, while that for the train will be 04. The pattern is similar in respect of administrative

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and technical services too. For additional busses, the administrative and technical staff will also have to be increased, but it is not so in respect of trains. Currently, there are about 300 trains in use, and if the capacity of a train is considered as that of 30 busses, current capacity of the railway is an equivalent to 9,000 busses. When the current staff strength of the railways (15,000) is divided by that 9,000, it indicates that the average number of railway staff per unit of passenger bus is even less than 02. But the number of staff per bus is more than 10 in the Sri Lanka Transport Board (SLTB).

The reduction of transport cost could narrow down the existing enormous gap between the farm gate prices of agricultural produce and the retail prices paid by the consumer. When the contribution of the railway to national transport increases, it will lead to reduce the cost of living. Further, environmental benefits such as low carbon emissions can also be obtained.

Table 1

Revenues and expenditures of the Railways in some initial years

Year	Railway network (miles)	Passenger transport income (Rs)	Goods transported (Tons)	Total revenue (Rs)	Total expenditure (Rs)	Profit/(Loss) (Rs)
1905	562	6,281,537	580,120	9,690,653	4,766,872	4,923,781
1920	731	11,262,657	863,120	20,415,816	14,473,439	5,942,377
1930	957	14,919,282	1,013,893	25,324,379	21,910,247	3,414,132
1940	957	10,405,985	1,018,030	17,107,451	21,157,355	-4,049,904
1950	896	24,316,310	1,280,891	57,650,139	71,272,521	-13,622,382

Source: Administrative Reports of the Sri Lanka Government.

In this context, it is important to review the contribution made by the railway in the past, its current status and the targets and potentials for development in the future.

Sri Lanka Railways at the Initial Stages

Sri Lanka Railways (Ceylon Government Railways) was commenced in 1867, with the objective of transporting coffee and tea from the upcountry to Colombo. Accordingly, for several decades, the main source of revenue for the Railways was transport of goods, but subsequently that position was replaced by the transport of passengers, due to the gradual expansion of the services sector. Table 1 indicates that the Railways earned profits for the government during those initial stages.

At the inception, tea industry contributed to the profitability of railway transport. The outputs of the plantations were transported to Colombo in the downward journey, and machinery, fertiliser, food items and labourers were transported in the upward journey from Colombo. According to Government's Administrative Reports for the year 1900, Rs. 55.7 mn out of the total export revenue of Rs. 90.8 mn was earned through tea exports. The revenue of the Railways too increased correspondingly. In the year 1905, 28% of the total revenue of the government was contributed by the Railways earned mainly from goods transport. In 1905, 25% of the total revenue of the Railways had been contributed by the plantation sector. According to the administrative reports of the second half of the 19th century, even after setting off of interests on loans obtained to construct the Railways, there had been a surplus of Rs. 2 lakhs.

The Commencement of incurring losses by the Railways

The Railways commenced incurring losses during the period of 1935–1941 (Table 1). The volume of goods

transported during this period shows a decline. The reason was the commencement of bus and lorry services for the transport of passengers and goods respectively. The losses of the Railways had continued to increase since 1947, and the same situation continues even today. According to government's administrative reports, by the year 1950, the expenditure of the Railways exceeded revenue by 10%, but by the year 1968, the loss had increased to 52.4%. The wages policy of the government and the policy limitations imposed by the government in the pricing of passenger and goods transport were factors that contributed to this situation. Another significant event was the removal of limitations imposed on lorry transport in 1951. Thus, the Railways lost the monopoly it enjoyed on goods transport.

The factors that contributed to the decline of goods transport by Railways

By the year 1969, all the coal-fired engines had been decommissioned, and all the fleet became diesel-powered. In 1959, the system of colour signals was introduced, minimising the delays and facilitating the deployment of an increased number of trains. But the Railways could not catch up the next global trend of electric trains. This contributed to increase the recurrent expenditure while reducing the efficiency of the Railways. Since gaining of the independence, welfare concepts came to the fore, leaving aside profitability and competitiveness, the Railways became an institution providing public welfare while depending on funds from the Treasury. While prioritising on passenger transport, goods sheds, yards, access roads to port, etc. that facilitated goods transport were neglected and allowed for misappropriation.

Similarly, the process of privatisation and restructuring of State institutions since the 1980s resulted in the loss of transport contracts that the Railways had with them. Due to the privatisation of activities of the Food Department, Cement Corporation, Fertiliser Corporation, Flour Manufacturing Corporation and Oils and Fats Corporation, the Railways lost the opportunities for transport of their finished goods as well as raw materials. Later, bowser trucks joined the transport of petroleum, thus making the Railways redundant in that sector too. When rail transport is used, goods have to be transported to and from the railway stations using other modes. Therefore, it is inevitable that the costs associated with loading and unloading would increase. These higher costs also contributed to the gradual diminishing of transport of goods by the Railways. Due to economics of transporting goods from farm or factory straight to market, lorries became the preferred and more established mode of goods transport.

Another factor that contributed to the failure of the Railways as a mode of cargo transport is the fact that the institution is still being governed by the rules and regulations of the colonial era. For 145 years, these regulations had been preventing new commercial strategies being adopted. Financial Regulations, Establishments Code and Government Circulars are discouraging responsibilities by the management. The officers are discouraged, and they resent new experiments or changes. Even a small improvement in lengthy processes relating to minute matters are difficult to be implemented. In this context, the only option for the minimisation of losses was to reduce expenditure. Accordingly, loss-incurring routes such as Awissawella–Opanayake were closed down, and some services and out agencies situated away from the railway lines were

withdrawn. The staff of the Railways comprised of public servants who were governed by the rules and regulations of the government; their skills and efficiency were not recognised or encouraged, but job security was ensured even for the most lethargic. As a result, recruitments, particularly for the skilled technical grades, faced various difficulties, a number of vacancies left unfilled and the productivity of the railway staff deteriorated.

Infrastructure facilities of the Railways

The Railways is in possession of adequate infrastructure to provide an islandwide service. Table 2 summarises the existing physical and human resources available with the Sri Lanka Railways.

Reasons for the non-expansion of the Railway Transports

Cargo transport

One of the reasons for non-popularity of the railway transport is the higher prices. At the same time, non-adherence to a specified timetable also contributes to this. The Railways charges a minimum of Rs. 950 (considering only the operational costs) to transport goods for one kilometre. For an example, if one cube of sand is transported from Manampitiya to Colombo, the transport cost charged by the Railways alone exceeds the sale price of one cube of sand in the open market. Accordingly, transporters prefer the least-cost method which is still the road transport. Due to insufficiency of locomotive engines, the cargo transport could not be given priority, and therefore, delays could not be avoided and consequently rail transport was grinding to the lowest level.

Passenger transport

If passenger transport by rail is somewhat popular, it is only in urban areas. Except for long-distance trips and office-time in-bound/out-bound trips, all other trains run with below-capacity number of passengers.

Development of a network of highways and opening of expressways will further reduce the popularity of train travel. The increase in the number of privately-owned vehicles, particularly those of low-cost small vehicles such as three wheelers and two wheelers, has reduced the propensity of the people to use public transport. But, as undesired side-effects of that development, road traffic congestions and accidents have also increased. At the same time, at the macro level, the country is incurring a huge cost on fossil fuels. Therefore, it is crucial for the country, if the public once again, commences using more public transport.

Improvement of the efficiency of the Railways and enhancing its share of transport

The steps that should be taken to improve the efficiency of the Railways and its share of the transport sector in the country are discussed in this section.

Re-organisation of administration

The continuation of the Railways as a government department is no longer beneficial for the country's economy. Delays in decision making are inevitable under the government regulations. Centralised decision making makes an institution fully dependent on a single person's abilities or disabilities. Instead, decisions should be taken collectively, and target setting, restructuring and assigning of responsibilities should be decentralised. An administration structure which is free of

unnecessary political interferences and devoid of acting and covering appointments should be established.

The administration model of the colonial era has become extinct even in the imperial countries which introduced it. This system of a single head should be done away with and replaced with a main administrative council which should be comprised intellectuals and experts in the relevant fields. In the current scenario, the chief manager is compelled to spend most of his time on matters irrelevant to running of trains and consequently time available for him for railway policy planning has become insufficient. Due to the procedural inflexibilities of the State administrative model, approximately 50% of the approved cadre remains vacant, while a substantial part of the annual allocations of funds remain unutilised.

Efficient utilisation of the resources of the department

If the assets of the Department of Railways are properly utilised, a substantial amount of income could be earned. Such funds could be utilised to set off some of the operating expenses. Assets with huge values remain under-utilised, and due to the State rules and regulations which have to be complied with, no capital infusions could be made to enhance the value of such assets. For an example, under the Lands Ordinance of the Government, the maximum period that the properties of the Railways could be leased is 05 years and the

Table 2 Some infrastructure facilities of the Railways in 2011

Type of facility	Number	Operational	Not operational
Locomotive engines	138	92	46
Power sets	69	57	12
Railways (km)	1,440		
Railway stations	363		
Approved cadre	17,173		

Source: Records of the Department of Railways.

lessee can use such assets only for short-term purposes such as crop cultivation. As a result of such limitations, valuable investment opportunities are missed and assets remain unused or misused. To develop these assets, a State-owned company (based on the Indian Model) should be established under the Companies Act. Accordingly, catering services, reception halls, parking spaces, and rest rooms of the Railways can be reorganised and can be made profitable.

Minimisation of the under-utilisation of railway lines

It has been estimated that the existing railway lines are used only for 25% of the available time. For an example, trains run only for 80-120 minutes per day in the 1.5km section between Kalutara North and Kalutara South. As such, the line is under-utilised for 20 hours per day. This is a substantial issue, and the lines utilisation should be increased at least up to 12 hours a day. Increase of the transport of cargo could be a viable alternative for this purpose.

Short-term concessions from the government

The main reason for the non-attractiveness of the Railways for cargo transport is the higher cost (per tonne of cargo). Therefore, there is a need to subsidise goods transport charges for a short period. The operational expenses per unit of cargo can be minimised only with the increase of volumes, and subsidies will have to be continued until the demand reaches to that level.

Minimisation of the transport of empty carriages

Minimisation of the transport of empty carriages is also a must. The carriages which transport raw materials should bring in finished goods on the return journey and vice versa. The main (up country) line was profitable at the initial stages due to the minimisation of unit cost achieved through transport of food, machinery, fertiliser and labourers on the upcountry journey and tea on the Colombo-bound journey.

Use of new technology

The traditional institutions and positions created during the initial stages to suit the social and economic environment at that time still prevails, and there is a large number of service-providing points too. All these contribute to increase the wage bill of the Railways. An example is collection of revenue from railway stations is still done using an iron safe which has been in use from the 1800s. The minimum use of information technology in the offices results in waste of labour. Sub contracting of non-mechanical civil constructions, sanitary and security services, etc. would help minimise costs, which in turn would help make the Railways profitable.

Replacement of the existing container-type wagons with improved high-speed wagons

The Indian Railways is already using carriages which are capable of exceeding 100km per hour. When goods are transported in such carriages, goods trains do not have to give way to the passenger trains. This would help augment the goods transport by the Railways.

Protection of the existing resources

It is essential that the existing lands and buildings are well protected. The release of the Railway lands for large-scale long-term projects might seriously jeopardise future development activities of the Department. To recommence goods transport and expand passenger transport, it is essential to protect the land reservations of the Railways.

Construction of new railway lines

In the construction of new railway lines, rather than focusing on thinly-populated areas based on speculative future projections, it is important to give priority to urgent requirements such as double lines between Colombo-Homagama, connection of Jayawardhanapura - Kotte to the railway network and a

third line up to Moratuwa, etc. Such a policy would also help reduce the road traffic congestion in and around Colombo.

Other strategies

The main reason for the reduction in the number of passengers, particularly during night, is the potential risks of thefts and burglaries. Running few trains during night also contributes to the same problem. For an example, the day's last train on the coastal line is the Aluthgama-bound one at 9.30 p.m. and the next train will be the Kalutara-bound one at 5.30 a.m. in the following morning. Enhanced security in the trains at night and parking facilities for motor vehicles and bicycles of the passengers at the railway station would help attract more passengers. Similarly, deployment of modern carriages with high-quality facilities for the office-time trains and other passenger trains and also initiation of an appropriate security mechanism for such facilities may help attract and retain more passengers. Already, two luxury coaches have been deployed in the Inter-City service as a joint venture between the Railways and the private sector. The tickets have been priced at rates six times higher than the normal rates, but the fact that advanced bookings for six months exists for that service reveals that a demand prevails for high-quality services.

Conclusion

The Railway service which spends a huge amount of public funds should face the current challenge of maximising efficiency of utilisation of its resources and management to minimise losses and to reach at least the break-even point. If the losses are reduced, the prevailing higher prices for goods and passenger transport could be reduced and rationalised. Time should not be lost by the Railways in realising and enhancing its share of national transport by implementing the measures suggested above. ■

Economic Development

Introduction

Although development has been a constant concern of government policymakers, economists and other social scientists and has touched the lives of more people than ever before, defining the concept in a precise manner has been a major theoretical and practical challenge. From this conceptual indeterminacy, competing ideas as to how best to measure and promote development have arisen. Different people may hold different views as to what constitutes development. Some may believe that development means higher incomes. Others might believe that development is a change in the structure of the society or of institutions. Still others might consider development an improvement in the health and education outcomes of a given population. Economics tells us that all of these factors are important in shaping an economy capable of supporting its population. Thus, the main objective of this article is to explain how the meaning of development evolved over the years from a 'growth-based' narrow concept to a multidimensional human development concept.

Growth and Development

The term 'development' has traditionally meant the capacity of a national economy to generate and sustain an annual increase in its **Gross National Product (GNP)**. A common alternative economic index of development has been the use of rate of growth of per capita GNP to take into account the ability of a nation to expand its output at a rate faster than the growth rate of its population. Thus the traditional approach to 'development' has been to see economic growth as a proxy for development; policies that led to growth were necessarily seen as pro-development and inherently

good; policies that had little, negligible or negative impact on growth were seen as necessarily improper.

Implicit in almost every use of the term 'development' is the notion that some countries and regions of the world are extremely poor, whereas other countries, relatively small fraction of the world population, are very prosperous. The discussion of development is always tied up with basic questions like; why are poor countries poor and rich countries rich? why do poor countries lag behind rich countries in the development of their standards of living? and how can poor countries become more prosperous? In this sense, an important dimension of the concept of 'development' refers to economic growth or more precisely growth of national income per capita.

Development conceived of as economic growth is a quantitative concept and basically means more of the same. Yet, economic development in the past has also been typically seen in terms of the planned alteration of the structure of production and employment, generally referred to as *structural change*. When development economics first emerged as an academic discipline after the Second World War, economists operated in a much more certain intellectual environment. They believed that development would effectively replicate the experience of the countries which had already industrialised during the nineteenth century, in particular, that development would follow the experience of Britain, France, Germany, the United States and Japan. The problem of development was conceived as transforming the backward *traditional* economies into *modern* economies by accelerating economic growth through rapid industrialisation. Further, the importance of increased savings and capital accumulation was stressed in the economic growth process.

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Thus, in the process of economic development, it was expected to increase the share of the dynamic industrial sector in national output and employment and decrease of the share of agriculture. Another important qualitative change that is expected to be associated with economic development is *technological change*; the on-going process of change in process and product technologies, resulting in radically new modes of production and new product ranges. It is possible to have growth without any economic development – a skewed growth where the gains in income are highly concentrated and economic mobility is very limited. An example is provided by some of those oil-exporting countries, which experienced sharp increases in national income but showed hardly any changes in their economic structure. It is unlikely, however, that significant economic development will occur without, at least, moderate economic growth. In other words, economic growth may be necessary, but not a sufficient condition for economic development.

On the whole, prior to the 1970s, development was nearly always seen as an economic phenomenon in which rapid gains in overall and per capita GNP growth would either 'trickle down' to the masses in the form of jobs and other economic opportunities or create the necessary conditions for the wider distribution of the economic and social benefits of growth.

Development as a Multidimensional Process

In the 1970s, the identification of development with economic growth came under increasing criticism. The experience of the 1950s and

the 1960s, when many developing nations did realise their economic growth targets, but the levels of living of the masses of people remained for the most part unchanged, signalled that something was very wrong with this narrow definition of development. Authors such as Dudley Seers, Gunnar Myrdal, Paul Streeten, Hollis Chenery, Mahbub ul Haq and institutions like the International Labour Organisation (ILO) pointed out that developing countries did not experience much change in the living conditions of the masses of the poor in spite of the impressive growth figures in the post-World War II period. They came to the conclusion that development involves more than economic growth and changes in economic structures. Seers formulated three additional requirements for the use of the term development, namely, there should be a decrease in poverty and malnutrition, income inequality should decline, and the employment situation should improve. According to Seers, the purpose of development is to reduce poverty, inequality, and unemployment. 'Redistribution with growth' became a common slogan in the discussions of development policies in the mid-seventies.

Other critics went even further and challenged the too narrow focus on the economic dimensions of development alone. A country can grow rapidly, but still do badly in terms of literacy, health, life expectancy and nutrition. Economic growth does not necessarily make people more happy or satisfied. In the mid-1970s, the International Labour Organisation proposed 'basic needs' approach to development, which focused on a bundle of essential services and goods required for attaining a minimum standard of living, and tried to measure access to this bundle in different countries. According to this approach if people are in a position to avail more amount of food, have better access to educational facilities, and have greater command over the civic amenities like water supply, water sewerage, healthcare, shelter, etc., all such would represent economic development. Therefore, according

to this approach whether GNP and per capita GNP increase or not, whether a fairer distribution of income is made or not, the real matter lies with the '**provision of basic needs or facilities to the people**'. The basic needs concept depends on culture and values. Basic needs change as income levels rise and society becomes more complex. The ILO has concluded that 'the concept of basic needs is a country-specific and dynamic concept'.

Criticism of growth fetishism led to the emergence of so-called 'social indicators', life expectancy, literacy, levels of education, infant mortality, availability of telephones, hospital beds, licensed doctors, availability of calories, and so forth. To measure economic development with this approach, a study was launched by the United Nations Research Institute on Social Development (UNRISD) in 1970. This study was concerned with the selection of the most appropriate indicators of development and an analysis of the relationship between these indicators at different levels of development. Accordingly, a composite '**Social Development Index**' was constructed. Originally, 73 indicators were examined. However, only 16 core indicators (9 social and 7 economic) were selected. They are: (i) life expectancy, (ii) population living in localities of 20,000 and over as a percentage of total population (urbanisation), (iii) per capita use of animal protein per day, (iv) combined enrolment at primary and secondary level education, (v) vocational enrolment ratio, (vi) average number of persons per room, (vii) newspaper circulation per 1,000 population (viii) percentage of economically active population with electricity, gas, water, etc., (ix) agriculture production per male agricultural worker, (x) percentage of adult male labour in agriculture (xi) electricity consumption, KW per capita, (xii) steel consumption, kg per capita, (xiii) energy consumption, kg of coal equivalent per capita, (xiv) percentage of GDP (gross domestic product) derived from manufacturing, (xv) foreign trade

per capita, and (xvi) percentage of wage earners to total economically active population. The constructed development index was considered to be more suitable than per capita income approach to measure economic development. On the basis of such '**Development Index**', the ranking of certain countries differed from the ranking made on the basis of GNP per capita.

In an effort to provide an alternative measure to GNP per capita as an indicator of development, Morris David Morris created the '**Physical Quality of Life Index** (PQLI) in the mid-1970s for the Overseas Development Council in the United States to measure the *quality of life* or well-being of a country. He included three indicators, namely, life expectancy, infant mortality rate and literacy rate. For each indicator, he devised a scale which included the numbers ranging from 1 to 100 where 1 represents the worst performance by any country while 100 for the best performance. For life expectancy, the upper limit of 100 was assigned to 77 years which was achieved, by Sweden in 1973, and the lower limit of 1 was assigned to 28 years which was the life expectancy of Guinea-Bissau in 1960.

Sen's Economic Goals

Amartya Sen, the 1998 Nobel laureate in economics, has argued for an even broader concept of development focusing on the concept of freedom. He sees development as an integrated process of expansion of substantive freedoms. According to Sen, economic growth cannot be sensibly treated as an end in itself. Development has to be more concerned with enhancing the lives people lead and the freedoms that they enjoy. Sen understands human well-being as a multidimensional phenomenon that cannot be captured by a single indicator such as income. Hence, he proposes enlarging the informational space in assessments of well-being achievements with emphasis on two concepts: functionings and

capabilities. The functionings are the valuable activities and states that make up of people's well-being. Functionings are related to goods and income but they describe what a person is able to do or be as a result. Examples of functionings include both basic and complex achievements such as living long, being adequately nourished, enjoying good health, being happy, having self-respect and participating in social and political activities in the community. The notion of capability is essentially one of freedom – the range of options a person has in deciding what kind of a life to lead. In other words, capabilities refer to genuine freedoms a person enjoys to lead the kind of life he or she has reason to value. An obvious example of capability deprivation is starvation, assuming a person considers getting enough food and nutrition to be a valuable state.

For Sen, freedom (not development) is the ultimate goal of economic life as well as the most efficient means of realising general welfare. Overcoming deprivation is central to development. Economic growth, technological advance and political change are all to be judged in the light of their contributions to the expansion of human freedoms. Among the most important of these freedoms are freedom from famine and malnutrition, freedom from poverty, access to healthcare and freedom from premature mortality. Unfreedoms include hunger, famine, ignorance, unsustainable economic life, unemployment, barriers to economic fulfilment by women or minority communities, premature death, violation of political freedom and basic liberty, threats to the environment, and little access to health, sanitation, or clean water. Sen argues that the 'capability to function' is what really matters for status as a poor or non- person.

The use of the concept of freedom as a normative yardstick for development is insightful. Development can be seen as a process of expanding the real freedoms that people enjoy. The goal of development is the promotion and expansion of valuable capabilities. In this perspective, economic growth remains important, but not as a

goal in itself. It is important in its potential contribution to a wide range of freedoms. Sometimes changes in other spheres such as education and health can be at least as important in the expansion of freedoms. Over the past two decades, Sen's capabilities approach has become extremely popular among development economists and social science methodologists. Development cannot focus only on income, but we also need to look at other factors impacting on a person's capability to function. Sen's analysis is part of what has given the United Nations' Human Development Index, which accounts for health and education as well as income.

The World Bank, which during the 1980s, championed economic growth as the goal of development changed its stand, and in its 1991 World Development Report, asserted that the 'challenge of development is to improve the quality of life'. The improved quality of life involves higher incomes, better education, higher standards of health and nutrition, equal opportunities, greater individual freedom and a richer cultural life. From the above discussion, we can conclude that development is not purely an economic phenomenon but rather a multidimensional process involving major changes in social structures, popular attitudes and national institutions as well as the acceleration of economic growth, reduction of inequality and the eradication of poverty. Development is both a physical reality and a state of mind in which society has, through some combinations of social, economic and institutional processes, secured the means for attaining a better life. Whatever the specific components of this better life, development in all societies must reflect three basic components or core values. They are:

- i. *Sustenance*: All people have certain basic needs without which life would be impossible. These life-sustaining basic human needs include food, shelter, health and protection.
- ii. *Self-Esteem*: Creating conditions conducive to the growth of people's self-esteem through the establishment of social, political and economic systems and institutions which promote human dignity and respect.

In addition to higher incomes, the provision of more jobs, better education, and greater attention to cultural and human values will serve not only to enhance material well-being but also to generate greater individual and national self-esteem.

iii. *Freedom from servitude*: Increasing people's freedom to choose by enlarging the range of their choice variables. Freedom here is to be understood in the sense of emancipation from alienating material conditions of life and from social servitude to nature, ignorance, other people and dogmatic beliefs. The concept of human freedom should also encompass various components of political freedom, personal security, rule of law, freedom of expression, political participation, and equality of opportunity.

Human Development Index

The broadening the definition of development in this manner entailed challenges related to the measurement and operationalisation of the concept. A broader concept of development should require a broader set of measurement instruments. Human development has many facets; so any index of human progress should incorporate a range of indicators to capture this complexity. But having too many indicators in the index would blur its focus and make it difficult to interpret and use. Use of a small set of indicators would therefore be desirable to allow cross-country comparisons, and to keep policy makers focused on the overall trend of development progress. Based on this choice, the United Nations Development Programme (UNDP) developed its main progress assessment tool, the Human Development Index (HDI) in 1990 shifting the focus of development economics from national income accounting to people-centered policies. The broadening of the notion of development allowed overcoming some of the limitations of the previous, 'economic growth-based concept' of development. It treated income as a *means* and not as an *end*; it challenged the erroneous assumption that there was an automatic link between growth and progress in human development; it overcame the notion that people are simply *means*

of production, and focused on individuals as *ends* of the productive process. This index is calculated every year and published in the UNDP Human Development Report. The HDI has had a significant impact on drawing the attention of governments, corporations and international organisations to aspects of development that focus on the expansion of choices and freedoms, not just income.

The HDI is a composite index which measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. A long and healthy life is measured by life expectancy at birth. Knowledge is measured by mean years of schooling and expected years of schooling. A decent standard of living is measured by GDP per capita in Purchasing Power Parity (PPP) terms in US dollars.

Although highly desirable, these goals have not yet been fully attained by any country; so the actual indicators are expressed as decimal shares of the ideal. Accordingly, the HDI value varies between 0 and 1. One of the main advantages of the HDI is that it allows countries to be ranked in the order of their achievements in human development. On the basis of the achievement of human development, countries are classified into four; very high, high, medium and low human development. HDI classifications are relative - based on quartiles of HDI distribution across countries. In the recent ranking based on the 1911 Human Development Report, the top five countries were Norway, Australia, Netherlands, United States and New Zealand. The bottom five countries were Chad, Mozambique, Burundi, Niger and Congo. The top five developing economies were Singapore, United Arab Emirates, Cyprus and Brunei. The Human Development Index for selected countries for the year 2011 is given in Table 1.

The disadvantage of the Human Development Index is that it does not allow us to judge the relative importance of its different

Table 1 Human Development Index for selected countries, 2011

Country	Ranking	HDI	Country	Ranking	HDI
Norway	1	0.943	Singapore	26	0.866
Australia	2	0.929	Malaysia	61	0.761
Netherlands	3	0.910	Sri Lanka	97	0.691
United States	4	0.910	China	101	0.687
New Zealand	5	0.908	Thailand	103	0.682
Canada	6	0.908	Maldives	109	0.661
Ireland	7	0.908	India	134	0.547
Liechtenstein	8	0.905	Pakistan	145	0.504
Germany	9	0.905	Bangladesh	146	0.500
Sweden	10	0.904	Nepal	157	0.458

Source: UNDP, Human Development Report 2011.

components or to understand why a country's index changes over time - whether, for example, it happens because of a change in GNP per capita or because of a change in education or health. The human development index ranking of some countries differs significantly from their ranking by real GNP per capita. The difference between a country's human development ranking and per capita income ranking shows how successful it is, compared with other countries, in translating the benefits of economic growth into quality of life for its population.

Sustainable Development

Sustainable development has been defined in many ways, but the most frequently quoted definition is from the Brundtland Report: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Environmentalists have used the term *sustainability* in an attempt to clarify the desired balance between economic growth on the one hand and environmental preservation on the other. For economists, a development path is sustainable if and only if the stock of overall capital assets remains constant or rises over time. Implicit in these statements is the fact that future growth and overall quality of life are critically dependent on the quality of environment. The natural resource base of a country and the quality of its air, water and land present a common heritage for all generations. The achievement of sustainable development requires the integration of its economic, environmental and social

components at all levels. Only development that manages to balance these three components can be sustained for long. Conversely, ignoring one of the aspects can threaten economic growth as well as the entire development process. For example, industrial growth might conflict with preserving natural resources. Yet, in the long term, responsible use of natural resources now will help ensure that there are resources available for sustained industrial growth far into the future. If we do not balance our social, economic and environmental objectives in the short term, it would not be possible to sustain our development in the long term.

A better understanding of the need for sustainable development first led to attempts to 'green' national accounts - that is, to account for changes in *natural capital* in calculations of gross domestic product and then to the development of statistical methods to account for changes in a country's human capital. Over the past two decades, the concept of sustainable development has become more comprehensive and measurable. A recent World Bank study defined sustainable development as 'a process of managing a portfolio of assets to preserve and enhance the opportunities people face'. The assets that this definition refers to include not just traditionally accounted physical capital, but also natural and human capital. To be sustainable, development must provide for all these assets to grow over time - or at least not to decrease.

A Critical Appraisal of some Aspects of Income Tax

Authored by Cecil Aluthwela, published by Stamford Lake (Pvt) Ltd., 2011

Reviewed by
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In the current context of economic development when the country is undergoing rehabilitation after a three-decade-long conflict and poised for an economic take-off, the issues of taxation and fiscal policy take on added importance. Taxes in Sri Lanka finance 65 per cent of the government's expenditure and lending, and in the context of a declining tax ratio to GDP (Gross Domestic Product) in recent years, the issues involving current taxation, particularly in income tax which brings in about 20 per cent of tax revenue or around 3 per cent of GDP, assume crucial significance.

This book, written by a former Deputy Commissioner of the Inland Revenue Department, therefore, is timely and consists of a collection of essays dealing with both tax policy issues and tax administration using his wide knowledge of the subject and experience in administering income tax in the Department.

Commencing with a description of the historical background of taxation, the author goes on to discuss issues such as tax avoidance and evasion, tax amnesties, some issues argued in several tax cases in Courts, a critical analysis of various administrative aspects of taxation including raids and penalties, relations between the tax authorities and the taxpayers and includes a historical perspective of tax administration in Sri Lanka from 1932 to 2007.

These issues discussed, both policy and administrative, assume importance as they figure in the current attempts at reforming the taxation system by the Presidential Taxation Commission of 2009. This

point has been emphasised in the Foreword in the book written by a member of the Commission, Dr. Saman Kelegama.

In all these relevant issues discussed in the book, the author has been forthright enough to express his own views boldly, and as the title of the book indicates, it is critical appraisal of the issues discussed. As the Foreword states, "the author has not hesitated to be extremely critical where necessary, and has spared neither his department, colleagues, eminent tax lawyers and practitioners nor even some judgements of the Appeal Court and Supreme Court.

The book commences with a brief introduction to the subject of taxation giving a historical background as well as the basic principles that govern a tax structure where he discusses the relevant principles enunciated by Adam Smith in his "Wealth of Nations". This includes the broad classification of taxes into direct and indirect taxes and the fundamental principles of equity and progressivity which characterise a proper tax structure.

This is followed by a discussion of tax amnesties granted by successive governments in Sri Lanka with monotonous regularity. Here, the author takes issue with a prominent Chartered Accountant and tax consultant regarding the reasons attributed for the failure of tax amnesties. The Chartered Accountant took the view that the amnesties failed for two reasons:

- (i) that in the year of amnesty, evaded taxes were not in cash but in business, property and assets,
- (ii) that people did not have trust and confidence in the tax administration.

The author disagrees and takes the opposite view. On the first, he points out that a significant percentage of declarations was in fact in cash, and on the second, he states that it was precisely because tax evaders had nothing to fear in declaring that they took advantage of the amnesties in 1989 and the 1990s.

The discussion on tax amnesties is connected with two other relevant issues, tax avoidance and tax evasion, in Chapters IV and VIII of the book. Tax avoidance and evasion, though interconnected, are two different things legally. Tax avoidance takes place within the legislative framework where a taxpayer takes advantage of the loopholes in the law and the maximum advantage of the legislative provisions to minimise his tax liability. Tax evasion, on the other hand, is the total avoidance of tax liability by not adhering to the legal provisions of the tax laws. The author points out that, today, the drafting of tax avoidance schemes has become a big industry, and thus, a big problem to Inland Revenue authorities the world over. The Courts which were initially responsible for this, have now come out strongly against such schemes. In this respect, the author discusses the significance of the United Kingdom tax cases, *Duke of Westminster vs Commissioner of Inland Revenue (CIR)* which endorsed the taxpayer's entitlement to the letter of the law, and the subsequent cases of *Ramsay vs CIR*, *CIR vs Burmah Oil Co.* and *Furniss vs Dawson*, came out strongly against tax avoidance schemes.

In respect of tax evasion, the author in Chapter VIII reviews a Sri Lanka tax case of *Merril J. Fernando & Co. vs H.B. Gunadasa and others*, where he respectfully disagrees with the judgements given by the Court of Appeal and the Supreme Court when they held that the taxpayer was guilty of tax evasion. The author is of the contrary view that where the taxpayer had not concealed the primary facts, he cannot be accused of tax evasion.

The author's trait of having confidence in his own judgement and disagreeing with those of others is again manifested in Chapter V where he reviews an article by a leading attorney-at-law and tax consultant on the legal issues in tax investigations. The author disagrees with the tax lawyer on a number of matters. These include such issues as (i) the nature of tax investigation (ii) more appropriateness of judicial review than case-stated procedure (iii) the circumstances in which a taxpayer should move for a Writ of Certiorari (iv) the legality of seizing documents in the course of a Revenue Raid, etc.

The issue of Revenue Raids itself is specially gone into Chapter VI which discusses the powers of the Inland Revenue authorities in respect of entry, search and seizure. It deals with such issues as the effect a raid has on the party searched, the concept of Public Interest, the seizure of documents and other evidence, the effect on third parties, the evidence obtained on the basis of illegal search and the concept of Legal Professional Privilege.

On tax administration, the book covers many areas such as the penalties for incorrect tax returns, the relations between the Tax Department and the tax-paying public, the issue of establishing a Revenue Authority and a historical review of the Department in its 75 years of existence from 1932 to 2007.

Chapter VII which deals with penalties for incorrect returns

discusses a number of issues such as on whom is the onus of proof, the standard of proof, the concepts of fraud and wilful neglect, penalty mitigation, appeals against penalty and whether penalty provisions have attained their objective.

In respect of relation between tax authorities and tax-paying public which is crucial for securing a good compliance rate, the author maintains that except at the very early stage, the relations between the two have not been cordial. Initially, this was due to the lapses of the tax-paying public and eventually to the attitude and conduct on the part of the department. Overall, according to the author, the department must accept a greater responsibility for the breach of good relations between the department and the tax-paying public. Perhaps the tax officers of the department will probably dispute this view.

Many attempts have been made to minimise the defects in tax administration and improve the efficiency of the various units and branches of the Department. Such measures include procedural improvements, computerisation, training, performance incentives, establishment of a closed service, etc. In this context, one view was the establishment of a Revenue Authority. The author, however, disagrees with this as a panacea for the problems within the departments, and maintains that the problems within should be addressed and rectified rather than imposing a superstructure on the revenue departments.

Finally, the author traces the performance of the Tax Department during its seventy five years from 1932 to 2007. As stated in the Foreword to the book, the author has followed Dr. Gamani Corea's advice to follow up his earlier history of the Department up to 1957 by recording the events to the present day. He has done this in the present volume although in lesser detail. This chapter contains a whole lot of statistics regarding assessments, collection data, arrears, taxes in default, etc. as well as details of the human

resources and staff in the Inland Revenue Department and includes an Organisation Chart as at 31.12.2006 as well. However, his judgement is that overall (except for the period 1963-1977), the department has failed to achieve its primary functions of tax collection and combating tax evasion.

There are however some points an earnest reader may ponder on. One is that the issues discussed in various chapters may sound too technical and legal to the general reader interested in taxation, and particularly to the tax-paying public. Some issues may also appear to be outdated and irrelevant in the current context. However, such technicalities cannot be avoided in discussing a subject as taxation due to its very nature. Another point is that some may disagree with the author's viewpoints and contentions on a number of controversial issues and tend to agree with his adversaries. Finally, some may view the vehemence with which the author has expressed his disagreements on various issues with reputed Chartered Accountants, tax lawyers and tax practitioners and even with respected judges of the Appeal Court and Supreme Court, as too harsh and even incorrect. The reviewer, being a fellow student of the author in the Peradeniya Campus in its halcyon days and also a colleague in the Inland Revenue Department is familiar with the author's thinking on these various issues, and hence, is not surprised on the controversial nature of the views expressed in the book.

Nevertheless, overall, the book is an extremely useful source of information with thought-provoking discussions on a number of issues written in a lucid and readable style resulting from the author's long experience in tax administration. It would be an interesting and useful reference material for scholars, administrators, policymakers, tax administrators and the tax-paying public alike.

A Stamford Lake publication, the book is available for sale at the Lake House Bookshop and other leading booksellers.

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