Vehicle Inspection and Maintenance Policies and Programme – Sri Lanka[1]

1. Introduction

The active road vehicle population of 1,023,000 in 2000 has consumed 660.2 million liters of diesel and 278.40 million liters of petrol. Railways have consumed 399.9 million liters of diesel in 2000. The estimated base data of annual emission from the transport sector for year 2000 has been estimated as follows;

CO	2.014 million kg
NOx	0.290 million kg
SOx	1.231 million kg
Aldehydes	1.053 million kg

The Government of Sri Lanka (GOSL) has implemented the Ambient Air Quality program in the city of Colombo establishing two fixed air quality monitoring stations; one in area where high density of transport sector air pollution occurred (Central Business District of the City of Colombo called Fort) and the other in a low density transport zone (Meteorological Dept. Site). One mobile unit is available to monitor the area where needs arise. These stations were given by the Ministry of Transport and Environment (MOTE) to the Central Environment Authority (CEA) for continues monitoring. Average age of the active vehicle fleet is 6.2 years, which is relatively higher compared to international standards. In general, Sri Lankans have poor maintenance practices. It is now estimated that around 12,000 motor cars have converted to LPG, which is considered as an environment friendly cleaner fuel, however, no regulations are passed by the GOSL on the safety of the registered LPG driven vehicles by the Commissioner of Motor Traffic (CMT). The main constraint emerging is that the lack of appropriate vehicle maintenance and proper vehicle testing program at the point of registration or issuing the roadworthiness certificate. There is investment constraint to upgrade the vehicle fleet, to have more fuel efficiency vehicles and to use the environment friendly vehicles. Pricing policy of the country has influenced to have second graded fleet (used vehicle) and low fuel efficient vehicles with poor conditions (e.g.: increase of small diesel vehicle fleet, increase of low fuel efficient re-conditioned vehicles and high consumption of diesel fuel). The pricing policy and nature of monopoly market (oil company own by the government) of major petroleum product has distortion demand for fuel, further to supply high sulfur diesel and leaded petrol. The details are discussed in proceeding sections.

2. Fleet Structure and Emission Levels

The vehicle ownership ratio in Sri Lanka was 28:1 in 1991 and reduced to 20:1 in 2000. Per capita petrol consumption has increased from 12.7 liters in 1991 to 15.9 liters in 2000. The per capita diesel consumption has increased from 28.7 liters in 1999 to 54.7 liters in 2000. This shows that per capita petrol consumption has increased by 23% and per capita diesel consumption by 92%. The past decade of steady economic growth has resulted in sharp changes in the fleet mix. For example, Graph-1 highlights the changes in taxi service: imports of 3-wheelers from India started only after liberalization in 1978 but have grown rapidly during the 1990's. In the early 1980s typical Colombo Taxi was an aged Morris Minor, replaced after liberalization by reconditioned second-hand Japanese cars: the number of petrol taxies peaked at around 8,700 in 1991, falling to 5,900 by 1997. Clearly the recent explosive growth of 3-wheelers has met a need

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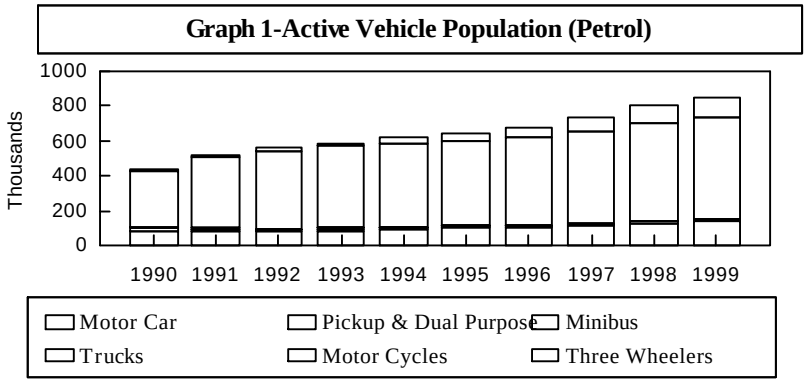
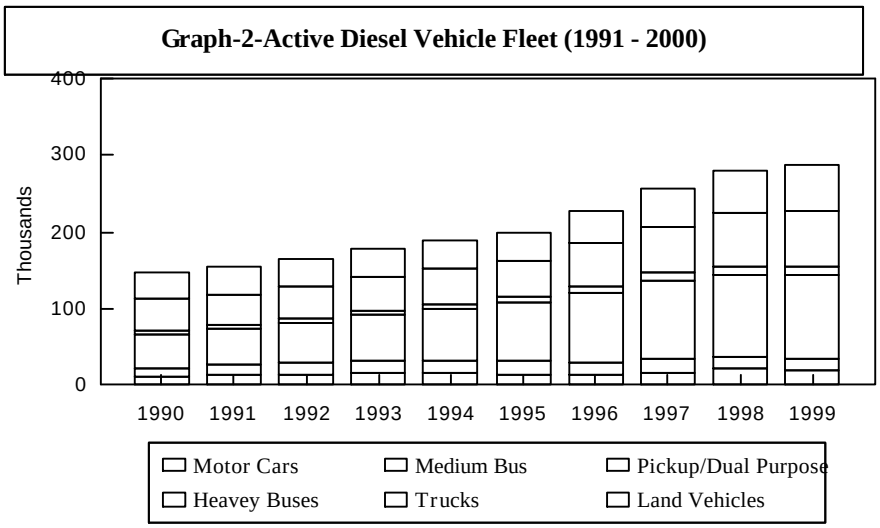
for urban transportation and maneuverability has severely aggravated traffic condition in Colombo. A similar picture is true for motorcycles. There are 575,00 motorcycles, accounting for 85% of all operational road vehicles in Sri Lanka.



It clearly shows that the small diesel vehicle fleet has increased during last ten years by 300% due to pricing policy of the diesel fuel vs. petrol. Graph - 2 shows the growth of diesel vehicle fleet and its composition.



It should be noted that 63% of the total four-wheel vehicles are diesel driven vehicles in 2000 compared to 46% in 1985 as shown in the Table-1.

Table-1 Active Vehicle Population by Fuel Type

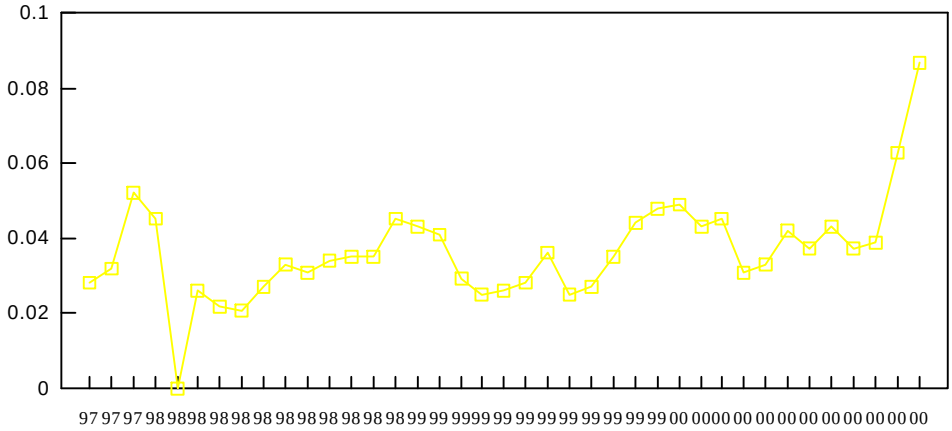
Year	Diesel Four Wheels	Petrol Four Wheels	Three Wheelers (Petrol)	Motor Cycles (Petrol)	Total
1981	50,415	76,196	1,743	56,433	184,787
1982	56,153	81,307	1,895	64,077	203,431
1983	63,824	86,077	3,290	74,769	227,960
1984	73,882	90,006	3,830	88,973	256,691
1985	85,337	94,844	4,071	108,500	292,752
1986	92,039	97,187	4,716	134,008	327,950
1987	94,938	99,002	5,982	159,029	358,952
1988	97,751	94,481	7,253	182,095	381,580
1989	129,385	96,935	8,019	243,328	477,677
1990	136,462	105,208	9,365	320,452	571,536

1991	166,848	111,665	10,679	325,099	614,292
1992	175,631	108,495	12,882	403,197	700,206
1993	186,123	105,569	13,532	445,035	750,259
1994	198,287	108,427	14,920	468,475	790,110
1995	210,336	116,090	24,905	480,395	831,726
1996	221,671	123,000	48,497	476,758	869,926
1997	250,371	126,891	59,119	499,208	935,589
1998	277,873	136,489	75,666	526,321	1,016,350
1999	301,915	146,856	108,430	553,028	1,110,230
2000	309,604	158,599	120,086	576,424	1,164,173

Source: Dept. of Motor Traffic & Ministry of Transport & Environment

The air quality monitoring data has been collected since 1997 are shown in the Appendix – 2 in-detail. The main highlighting is that some of the pollutant emitted by the transport sector has

Graph 3 - Average Concenration of NO (ppm) in FORT



been increased over a period in Fort site (see Graph – 3). The civil society of Sri Lankan has filed a court case in 1997 and got a ruling to enforce the emission standard for the road vehicles. The GOSL has gazetted the emission standard for road vehicles in 2000 and scheduled to be enforced in January 01, 2003 which is equivalent EURO-II standard (see Appendix-2).

3. Vehicle Inspection System

Current vehicle inspection system in Sri Lanka focuses on the physical fitness of the vehicle including smoke levels. However, ERO-I emission standard is taken for the all vehicles procured by the government since 1992. Present vehicle inspection method and its parameters are given in Appendix-3. Vehicle inspection is carried out at three levels, one at the original registration for all vehicles, second is only an annual inspection for commercial vehicles (Buses and Trucks), and last is on roadside by the Police. The first inspection is carried out by the CMT using some equipment. The registered private sector garages carry out the annual inspections of commercial vehicles. The Motor Traffic Act of Sri Lanka has included regulation to fine the vehicle, which has high smoke levels. This does not include any standard of pollutants. It is the duty of Sri Lankan Police to fine these vehicles observing the visible smoke levels. These kinds of detractions are limited to very small number (only 34 cases for 2000).

The present vehicle inspection system (all three levels) does not include emission levels of vehicles. It was also noted that no records have compiled on 2-storke motor cycles and three wheelers. The research studies show that 210,000 motor cycles are 2-stroke (equivalent to 20%

of total vehicle population) and 120,000 2-stroke (all most all) three wheelers, in the present fleet. The vehicle inspection system in Sri Lanka aimed for road safety. It has not been geared to meet the environment issues until an NGO filed first court case. The primary concern of vehicle inspection program was to collect revenue.

Sri Lanka has long been criticized for relatively high sulfur content of its diesel fuel, which most studies assume at or near specification value of 1.1%S by weight, indeed as suggested in Table-2, Sri Lanka has an unusually high sulfur specification for its diesel fuel.

Table 2 - Comparison of Specification for Sulfur in Diesel Fuel (%S by weight)

ASEAN(1)	1998	1999	2000	2001	Future Plans
Brunei	0.25	0.25	0.25	0.25	
Cambodia					
Indonesia	0.5	0.5	0.5		
Laos					
Malaysia	0.5	0.5	0.3		
Myanmar	0.5	0.5	0.5		
Philippines	0.5	0.5	0.5	0.2	
Singapore	0.3	0.05	0.05	0.05	
Thailand	0.25	0.05	0.05	0.07	
Vietnam	0.5	0.5	0.5		
OTHER					
India					
Bangladesh					
China(3)				0.2-1.0	0.2(in 2002)
Pakistan (2)				1	0.5(in 2002)
Sri Lanka	1.1	1.1	1.1	1.1	0.5 (in 2003)

Source: ASEAN, Proceeding Regional Workshop on Fuel Quality and Alternative Fuels, Delhi, May 2001☹1) G. Balce, Overview of Regional Fuel Market and Fuel Quality Standards in; (2) S.M. Zaidi, Country Experience of Pakistan in improving fuel quality; (3) Yangsheng, Improving Fuel Quality in China
One factor remain is that vehicle inspection system has to be included emission test taking sulfur level of diesel and other fuel quality.

4. Current Environment Policies related to the Transport Sector

Transport sector has continued to be expanding in response to the economic development during the post-independent, and especially during last two decades with the expansion of motorization. The transport sector contributed 8.5% to the GDP in 2000, which shows a significance of the transport sector activities within the national economic activities. Transport in itself is a significant part of the national economic activity, while it also impinges upon the performance of all other sectors, and thereby plays an important role in attracting foreign investors and industrial growth. This sector has recorded an average growth rate of 6.4% during last decade. It provides direct and indirect employment to around 550,000[2] persons with the state sector accounting for direct employment of 100,000 persons. The public expenditure on the sector has increased by 225% during last ten years, private investment increased by 200% for the same period.

Sri Lanka's transportation network covers 100,000 km of roads, and 1,467 km of rail network, 64 billion of passenger km, and 7 billion of freight tonne km by road, rail, air and sea, and the stock of active 900,000 road vehicles and rolling stocks of railways. The length of "A" and "B" class

[2] Ministry of Transport, "Progress", March, 2001

"national road" network has risen from 6,518 km in 1948 to 11,648 km in 2000.[3] In addition, there are 15,000 km of class "C" and "D" roads labeled as provincial roads, and further 77,000 km of class "E' and local access roads (i.e. bridle paths) that are generally earth and partly gravel roads. On the other hand, the rail network of 1,435.7 km in 2000.

Efficiency and effectiveness of the transport network and systems are a primary requirement for the economic development in the country. Over the past 30 years, however, the transport fixed infrastructure and services lagged behind relatively to the some of other sectors in the economy, especially in respect to the condition of road network, and the rail services. The average roughness of the national road network has increased from 4,200 Bump Indicator (BI) value in 1982 to 6,500 in 2000 which was the result of rapid growth of traffic demand and railway passenger market share has been reduced 22% in 1980 to 6% in 2000[4].

Much of the environmental issues related to the transport sector in Sri Lanka are associated with urban environment, and have been reported from the Colombo Metropolitan area and Kandy urban center which is the second largest city in the island. Of these, air pollution due to vehicle emission, exacerbated by traffic congestion and condition of the fleet are two of the major issues that have emerged in recent years. The other problem are the poor quality of land use development hampering the quality of pedestrian environment, noise pollution due to road traffic and poor drainage which inhibits vehicular and pedestrian traffic after heavy rains. There are also more indirect, but nevertheless vitally important, problems such as the destruction of biological diversity (in biological rich areas) and environmental degradation during road construction. Another problem given scant attention in this sector is the entry of alien species via shipping and air transport. The impact of road damage due to global warming and sea level rise, and its impact on the transport network, may also be considerable and has been dealt with previously under impacts of climate change.

The Colombo Urban Transport Study (CUTS) has been conducted through the Colombo Urban Transport Project (CUTP), implemented by the Colombo Urban Transport Planning Center of the then Ministry of Transport and Highways, as a follow up activity to the Metropolitan Environment Improvement Program (MEIP). Several activities of the Clean Air 2000 Action plan are included in the CUPT. The problems concerned with transport are mainly in relation to the Colombo Metropolitan Region. According to the CUTS the main source of air pollutants from the transport sector is vehicular emissions, compounded by traffic congestion.

At present, the national pricing policy of fuel promotes the use of diesel, which increases air pollution, but although it has been recommended that the pricing policy be revised to address this problem, no clear policy decision has been effected to date, mainly due to the increase in cost of living that would follow. There is also no policy for restricting vehicle imports in a bid to reduce congestion in the city as yet, although this too has been recommended. However, several important initiatives are underway to alleviate road congestion in Colombo through improvement of the network. This aspect also needs to be addressed in other cities such as Kandy. The problems of flooding and drainage in Colombo are also addressed through the plans for future development of the Colombo City. Policy measures have given rise to the introduction of EIAs and IEEs to minimize the damage caused to the environment during road construction. A main deficiency in this is that EIAs are required only when establishing roads over 10 km, which other roads necessitate only an Initial Environment Examination.

[3] Transport Statistics- Sri Lanka, 2001, Ministry of Transport
[4] Jayaweera, Don S." Transport Sector charges and Prices" ESCAP, December, 2000

Policy measures have been introduced to remove un-roadworthy vehicles from the roads, but this is not implemented due to the paucity of a strict vehicle inspection and licensing scheme. Measures were also to be introduced by the government to limit the number of private vehicles entering the city of Colombo to control congestion, but this was not practical due to the limited public transport facilities within the city.

Under the Clean Air 2000 Action Plan, several actions have been recommended to provide solutions to many environmental problems related to transport. One of the positive developments in terms of reducing the air pollution from transport vehicles includes the phasing out of leaded petrol by the year 2010, although the target of unleaded petrol in the market by 2000 has not been met with. Secondly there is a trend for a switch to Liquid Petroleum Gas (LPG) from petrol, but this is not due to a national policy, but due to lower price of LPG. Policy measures are also lacking in terms of addressing the poor quality of the pedestrian environment and the problem of loud intermittent noise from horns, compounded by the lack of a standard specification for horns. Further, there are no controls in force to regulate noise from traffic near sensitive areas such as hospitals and schools, or policy that precludes the location of such institutions (particularly hospitals) near roads with heavy traffic.

5. Environmental Issues in Road Transport and Future Programme

Vehicle maintenance is a widespread problem in Sri Lanka, as in other South Asian countries, and one that contributes towards air pollution. Although policy measures have been introduced to remove old vehicles from the roads, strict vehicle inspection and licensing do not happen due to technical and procedural deficiencies of the systems. These procedures need to be reviewed to better understand the constraints that underlie their failures and to identify improvements in enforcement measures. The government policy of importing second hand reconditioned vehicles for economic reasons has also aggravated the proliferation of poorly maintained vehicles. Despite the regulations, many of these vehicles are more than three years old, have done considerable mileage, and have high emission rates. Further, 17,500 private sector bus fleet consists of 78% of re-condition and more than years old buses. Hence, the introduction of proper vehicular inspection and maintenance programs is a vital requirement to reduce the load of air pollutants being released into the atmosphere.

Vehicle maintenance facilities are also often limited by lack of skilled labor. Hence, mobile training programs for motor mechanics in Colombo on better vehicle maintenance could be of considerable assistance to reduce vehicular air pollution. The practice of using smoke meters to check air pollution should also be continued with the collaboration of relevant government departments, the traffic police, the Provincial and Local Authorities, and the private sector. It has also been suggested that exhaust emission certificates issued by an authorized institution could be linked to the vehicle insurance scheme to motivate owners to engage in better vehicle maintenance practices.

5.1 Low capacity for monitoring vehicular emissions

A prerequisite to address the issue of vehicular emission is the availability of reliable emission data over a period of time, but availability of data on vehicular emissions has been limited in the past. This is now being addressed through a World Bank sponsored state programme for monitoring the ambient air quality in Colombo. However, much of the available data, as well as monitoring facilities, have been limited to Colombo, although there are plans to expand monitoring to other locations in the country. Further, due to the high cost involved in maintaining the three stations that are in operation in Colombo at present, it has been found to be necessary to use low cost standard methods to expand the monitoring of air quality levels in and outside the urban environment of Colombo.

5.2 Condition of the road network, Road Furniture and Traffic Management

A major problem in the transport sector is that the condition road network, road furniture and traffic management schemes have not been maintained, developed and expanded sufficiently to accommodate the increasing importance of vehicular traffic and the rapidly growing vehicle population, coupled with the lack of an alternate efficient transport system such as the railway. This has given rise to heavy road congestion in Colombo during peak hours, which has a direct bearing on the rising levels of air pollution in the city, particularly during peak traffic hours which also expanded from one and half hours to three hours. The unplanned land use and transport plan lead to concentration of industrial and commercial activities, schools, hospitals, and courthouses in Colombo has added to the problem of traffic congestion in this city.

The general unsatisfactory condition of the present road network has been a serious impediment to the expansion of economic activities. According to estimates made by the Colombo Urban Transport planning Center of the (then) Ministry of Transport and Highways, the cost of congestion in the Colombo Metropolitan Area had increased from SLRs 252 million in 1992 to SLRs 520 million in 2000. It has been recognized that the introduction of measures to ensure a smooth traffic flow could considerably increase fuel efficiency and help reduce air pollution, and successive governments have taken several initiatives to reduce traffic congestion in Colombo. These include installation of automatic traffic signals-where traffic jams are frequent-to regulate traffic flow, the shifting of the administrative capital to Sri Jayewardenapura Kotte, and the staggered opening and closing times of government and private establishments, factories and schools. However, none of these have had the desired effect of reducing traffic congestion in the city. Measures to reduce traffic flow into Colombo by limiting the number of private vehicles entering the city and employing luxury buses to deal with internal transport have been considered but not put into operation due to various constraints.

More recently, several physical means have been introduced to relieve road congestion. These include the two fly-overs being constructed over the railway lines at Dematagoda and Ragama in the Colombo Metropolitan Area; the construction of a new bridge over the railway line at Maradana, and establishment of pedestrian crossings and bridges to regulate pedestrian behavior; and the construction of the Kelani Bridge over the Kelani river to ease traffic congestion among vehicles coming to Colombo along the Kandy and Negombo roads. There are several other main road projects due for implementation to improve the road network and to ensure a smooth flow of vehicular traffic. The Marine Drive and extension of the Duplication Road projects are already in progress and the Colombo-Katunayake expressway from the new Kelani Bridge to the Katunayake Airport is due to commence. The construction is scheduled to commence in 2001 for Matara-Colombo expressway and Colombo Outer Circular Road (which will link all major roads radiating from Colombo), is in progress, while the feasibility study for the Colombo-Kandy expressway is now in progress.

5.3 Poor state of roads and pavements

The poor quality of road surfaces has been identified as one of the reasons for several transport hazards, including contributing towards road congestion. The maintenance and development of class A and B national roads and 4,480 bridges are vested with the Road Development Authority (RDA); class C and D roads are under the purview of provincial councils, while the other roads are maintained and developed by Local Authorities and other government and private institutions. Although the road density and coverage is relatively better in Sri Lanka compared to other developing countries, the condition of roads, particularly the provincial and local roads, have not

kept abreast with the growing demands for transportation, mainly due to resource constraints. For instance, about 88% of roads under class C,D, and E are poorly maintained.

Provisions for pedestrians have also continued to be poor due to the inadequacy of footways, zebra crossings and controlled crossing points that are either signalized or have barriers in the central reserve to channel pedestrians. Another problem is the poor state of the pavements, exacerbated during the rains due to poor drainage in the cities.

The Road Development Authority has implemented a number of foreign projects for better maintenance of national road surfaces during 1999, and 2000 under the periodic maintenance programme. However, almost all funds available last year have been used for rehabilitation, widening and construction of roads, while only about 5% was left for general maintenance of roads and bridges. The RDA is continuing its road rehabilitation and reconstruction of bridges programme in the Southern, Central, Western, and NorthWestern provinces, and some allocations have also been made for maintenance and development of provincial and local roads.

Despite these initiatives, many of the roads need better maintenance and repair, especially the smaller roads in the city suburbs and rural areas, while it is evident that most highways in the Colombo Metropolitan Area are operating at, or near, total capacity especially during peak traffic hours.

Beginning from large-scale changes in the natural environment with the building of the first road in Sri Lanka by the British in 1821, road building has had varying environmental implications such as destruction of biological diversity, dust and noise pollution. In order to minimize the adverse environmental impacts of road development it is required that Environmental Impact Assessment studies are done prior to commencement of such projects. However, only road projects over 10 km in length are covered under this requirement, while other important features such as conserving the trees and natural landscapes or components of biological diversity in the area; the vehicle population density; the human population in the area to be developed, etc. are generally not taken into account.

A number of road projects being implemented in the Colombo Metropolitan Region at present have given rise to environmental issues such as compensation for lost property and community facilities, noise and air pollution, and damage to cultural, religious institutions in the vicinity. Another problem is the poor attention given to drainage and flooding, and to canals and drainage out falls during development activities. It is also important that road design supports the canal and drainage rehabilitation programs that are in place. Further, there is poor coordination between road development and other development programs such as laying or repair of telecommunications and piped water lines so that roads dug up for these purposes are left in a state of disrepair.

5.4 Noise Pollution from traffic

The problem of noise pollution from traffic is localized and affects those on the road or living near main road in cities. Noise pollution arises due to intermittent noises from vehicle horns, Compounded by the lack of a standard specification for horns and differentiation between emergency and ordinary horns. Loud noise from two strokes motorcycle engines, noise from poorly maintained vehicles and the preponderance of heavy goods vehicles, which form a high percentage of the total traffic in the country add to the problem of noise pollution. Notably, in-

patients in hospitals in the vicinity of main roads are severely constrained by the incessant noise of traffic throughout the day, especially on the upper floors.

5.5 Addressing the vehicle and road related problems

The demand for an improved road network goes beyond road maintenance and expansion. Much of the traffic related problems result from inadequate and inefficient management of infrastructure together with imbalance of inter-modal distribution of traffic. In addition to the construction of by passes and fly-overs, better management of traffic on existing roads is an essential tool in road congestion as well as a national vehicle importation policy. The possibility of discouraging non-essential travel by private vehicles to the city by imposing rational parking fares, setting up vehicle parks in predetermined areas in the city and operating an efficient and adequate bus service to business places should also be re-considered. Other possible measures suggested for this sector are encouraging private sector participation of rules and regulations for proper fleet mixing, coordinated signals and better maintenance of exiting roads.

Transport related environmental problems in the Colombo area have been identified through the Colombo Urban Transport Study (CUTS), carried out under the Colombo Urban Transport Project, by the Metropolitan Environment Improvement Programme (MEIP) which was completed in 1999. Several actions have been recommended to provide solutions to air pollution and the key environmental problems related to transport Under the Clean Air 2000 Action Plan produced by the MEIP. Among these are the actions of particular importance to solve problems related to both transport efficiency and air pollution. These are: vehicle inspection and maintenance, fuel reformulation, pricing and fleet mix restructuring, emission inventory and monitoring, introduction of legal instruments and transport planning and traffic management. Much of these have still to be implemented. There is, therefore, a need for an extensive road development and management project to address these emerging issues in the transport sector. As such, the reduction of congestion, safer roads and an environment friendly transport system are challenges that have to be addressed by the transport sector in the future.

6. Conclusion

The vehicle inspection and maintenance policies and programs can not be isolated from the environmental issues of the transport sector. It is true that road sector vehicles are the main culprits for the air pollution in urban areas due to several reasons which were discussed in the paper. The current environmental policies have framed to arrest the present problem in the transport sector. It has not been addressed directly on issues related to vehicle inspection and maintenance program.

References

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5. Walsh, M- Motor Vehicle Pollution Control in Sri Lanka, A preliminary Strategy for progress in Colombo, Report to the Natural Resource and Environmental Policy Project (NAREPPP), Colombo July, 1992

APPENDIX - 1

The National Environmental Act, No 47 of 1980

Regulation

1. These regulations may be cited as the national; environmental (Air Emission, fuel and Vehicle Importation Standards) regulation No 01 of 2000 and shall come into effect on the 1st day of January 2003.

PART I

MOBILE AIR EMISSION STANDARDS

2. The permissible Mobile Air Emissions limits for every motor vehicle in use in Sri Lanka shall be sent out in the First Schedule hereto.

3. No user of a motor vehicle shall discharge emission s into the atmosphere exceeding the Mobile Air Emissions limits as set out in the first Schedule hereto?

4. (1) The Commissioner of Motor Traffic may authorize any garage as an accredited garage for the purposes of testing and certifying the mobile air emission standards of any motor vehicle.

   (2) The Commissioner of Motor Traffic shall obtain clearance form the Central Environmental Authority prior to certifying an accredited garage for the purposes of testing mobile air emission standards.

   (3) Every owner of a motor vehicle shall produce and annual compliance certificate of Mobile Air Emission Standards, issued by a garage authorized by the Commissioner of Motor Traffic as an accredited garage under paragraph (1) of this regulation.

   (4) No certificate issued by an accredited garage in respect of then mobile air emission standards shall be unless the measuring equipment used to test and certify the compliance of the Mobile air emission standards is in case with Standards No. R 99 of 1991 of Organization International De Meteorology Legal (OMIL).

PART II

FUEL, STANDARDS

5. Every person, who supplies fuel for the use of any motor vehicle, shall ensure the compliance of the permitted fuel standards as set out in the Second Schedule hereto.

PART III

VEHICLE SPECIFICATION STANDARDS FOR IMPORTATION

6. Every person, who imports into Sri Lanka any motor vehicle, shall comply with the vehicle specification standards as set out in the Second Schedule hereto.

7. In there regulations: -

(1) The word “motor vehicle”, “Motor coach”, “lorry”, “motor cars”, and “three wheelers” shall have the same meaning assigned to them under the Motor Traffic Act.

(11) The words “mobile air emission” means air emission from a motor vehicle.

FIRST SCHEDULE

(A) Petrol Vehicles

Type of vehicle	Pollution standard		Remarks
	Carbon monoxide CO (% vol.)	Hydrocarbon HC (PPM v/v)	
Petrol wo/cc	4.5 > 5 years 3.0 < 5 years	1200	Low idling
Petrol w/cc	2.0	400	Low idling
Petrol motor cycles and three wheelers	6.0	-	Low idling

Abbreviation:

wo/cc	-	Without catalytic converter
w/cc	-	with catalytic converter
> 5 years	-	vehicles more than 5 years old from the year of manufacture (used/unused)
< 5years	-	vehicles less than 5 years old from the year of manufacture

(B) Diesel Vehicles

Types of vehicle	Smoke opacity % (k factor (m-1))	
	Idle	Load
Diesel – Tare less than 1728 kg including three wheelers	65 (2.44)	75 (3.22)
Diesel – Tare more than 1728 kg	65 (2.44)	75 (3.22)

*k factor – Absorption coefficient

SECOND SCHEDULE

(A) Emission related Standards for Gasoline (Leaded and Unleaded)

Parameter	Unit	Standard		Test Method
		Leaded	Unleaded	
Reid Vapour Pressure	kPa	35 – 60	35-60	ASTM D 5191

		(38.0 ^{o}C)	(38.0 ^{o}C)	
Total aromatics (maximum)	% v/v	42	45	UOP 273
Benzene (maximum)	% v/v	3	4	ASTM D 3606
Lead content	g/L	0.15	0.013	ASTM D 3341 & ASTM D 5059
Sulphur (S) (maximum)	% m/m	0.1	0.1	ASTM D 1266
Gum (solvent washed) (maximum)	g/m^3	40	40	ASTMD 381
Oxygenates content (maximum) Ether (MTBE, ETBE), Alcohol	% v/v	15	15	ASTM D 4815
Research Octane Number (RON) (Minimum)		90	87-95	ASTM D 2699
Oxygen content	% m/m	2.7	2.7	by calculation

(B) Emission Related Standards for Diesel

Parameter	Unit	Standard	Test method
Cetane Number (minimum)		48	IP 21 or ASTM D 613
Density at 15 oC (maximum)	kg/m^3	820 – 860	ASTM D 1298
Distillation (T 90 – minimum)	^{o}C	370	ASTM D 86
Cetane Index	-	46	ASTM D 976 (by calculation)
Sulphur content (S) (maximum)	% m/m	0.5	ASTM D 1266

Abbreviations:

kPa	-	kilopascals
% v/v	-	percent by volume
g/L	-	grams per litre
g/m^3	-	grams per metre cube
kg/m^3	-	kilograms per metre cube
MTBE	-	Methyl Tertiary Butyl Ether
ETBE	-	Ethyl Tertiary Butyl Ether
ppmw	-	parts per million by weight
T 90	-	Temperature at which 90% of diesel evaporates

THIRD SCHEDULE

European Community Standard, or a Standard that is within the emission limits as specified in the following respective European Community Standard (EC) for particular emissions;

Commission Directive 96/69/EC for motor coach and lorries
Commission Directive 94/12/EC for motor cars
Commission Directive 97/24/EC for motor cycles and three wheelers.

APPENDIX - 2

FORT SITE										MET SITE									
YEAR	MONTH	AVERAGE CONCENTRATION (ppm)						PM10 (Micro g/m^3)		YEAR	MONTH	AVERAGE CONCENTRATION (ppm)						AVG OF 24HR AVG	
		NO	NOx	NO2	SO2	CO	O3					NO	NOx	NO2	SO2	CO	O3	PM10 (Micro g/m^3)	
1997	JAN	0.029	0.050	0.021	0.016	----	0.015			1997	JAN	0.002	0.012	0.010	0.006	0.626	0.030		
1997	FEB	0.024	0.046	0.021	0.010	----	0.014			1997	FEB	0.008	0.020	0.016	0.004	0.649	0.031		
1997	MAR	0.027	0.049	0.021	0.012	----	0.011			1997	MAR	0.007	0.017	0.014	0.004	0.632	0.033		
1997	APR	0.029	0.051	0.220	0.015	0.830	----			1997	APR	0.007	0.018	0.014	0.004	0.588	0.047		
1997	MAY	0.026	0.044	0.018	0.013	----	----			1997	MAY	0.007	0.016	0.012	0.003	0.512	0.063		
1997	JUN	0.02	0.029	0.010	0.009	----	----			1997	JUN	0.007	0.014	0.009	0.002	0.492	0.064		
1997	JUL	0.018	0.028	0.010	0.003	----	----			1997	JUL	0.004	0.010	0.006	0.003	0.452	0.115		
1997	AUG	0.027	0.040	0.013	0.002	----	----			1997	AUG	0.002	0.006	0.004	0.002	0.324	0.103		
1997	SEP	----	----	----	----	----	----			1997	SEP	0.004	0.008	0.005	0.003	0.430	0.158		
1997	OCT	0.028	0.047	0.020	0.002	0.962	----			1997	OCT	0.006	0.014	0.009	0.005	0.846	0.112		
1997	NOV	0.032	0.044	0.012	0.002	0.983	0.003			1997	NOV	0.008	0.012	0.007	0.005	0.968	0.043		
1997	DEC	0.052	0.071	0.020	0.003	0.963	0.002			1997	DEC	0.006	0.014	0.009	0.004	0.773	0.036		
1998	JAN	0.045	0.058	0.015	0.002	0.821	0.004			1998	JAN	0.004	0.013	0.009	0.005	1.146			
1998	FEB	----	----	----	0.002	0.684	0.006			1998	FEB	0.003	0.001	0.007	0.005	0.412			
1998	MAR	0.026	0.048	0.024	0.006	0.643	0.009			1998	MAR	0.020	0.025	0.016	0.005	2.046			
1998	APR	0.022	0.039	0.021	----	0.521	0.005			1998	APR	0.006	0.018	0.015	0.004	0.603			
1998	MAY	0.021	0.030	0.009	0.008	0.524	0.003			1998	MAY	0.005	0.011	0.009	0.003	0.272			
1998	JUN	0.027	0.038	0.011	0.011	0.374	0.001			1998	JUN	0.203	0.146	0.059	0.014	0.184			
1998	JUL	0.033	0.047	0.014	0.013	0.342	0.009			1998	JUL	0.085	0.070	0.032	----	1.355			
1998	AUG	0.031	0.044	0.013	0.013	0.360	0.007			1998	AUG	0.135	0.101	0.048	----	0.353			
1998	SEP	0.034	0.046	0.012	0.012	0.350	0.060			1998	SEP	0.123	0.077	0.027	----	0.071			
1998	OCT	0.035	0.049	0.014	0.010	0.425	0.005			1998	OCT	0.178	0.113	0.039	----	0.272			
1998	NOV	0.035	0.054	0.019	0.015	0.534	0.006			1998	NOV	0.234	0.151	0.064	----	----			
1998	DEC	0.045	0.070	0.024	0.022	0.726	0.009			1998	DEC	0.214	0.142	0.088	0.021	----			
1999	JAN	0.043	0.068	0.024	0.022	0.707	----			1999	JAN	0.004	0.013	0.012	0.011	1.317			
1999	FEB	0.041	0.065	0.024	0.015	0.796	----			1999	FEB	0.008	0.018	0.016	0.015	1.501			
1999	MAR	0.029	0.049	0.021	0.013	0.529	----			1999	MAR	0.022	0.031	0.030	0.080	7.510			
1999	APR	0.025	0.040	0.016	0.009	0.398	----			1999	APR	----	----	----	----	----			
1999	MAY	0.026	0.039	0.013	0.009	0.276	----			1999	MAY	0.010	0.008	----	----	1.273			
1999	JUN	0.028	0.039	0.012	0.013	0.301	----			1999	JUN	----	----	----	----	----			
1999	JUL	0.036	0.048	0.011	0.016	0.400	----			1999	JUL	----	----	----	----	----			
1999	AUG	0.025	0.036	0.014	0.008	0.301	----			1999	AUG	0.082	0.046	0.062	0.002	0.307			
1999	SEP	0.027	0.045	0.017	0.010	0.338	----			1999	SEP	0.173	0.102	0.006	0.010	0.383			
1999	OCT	0.035	0.055	0.020	0.017	0.509	----			1999	OCT	----	----	----	----	----			
1999	NOV	0.044	0.070	0.030	0.021	0.741	----			1999	NOV	0.231	0.145	0.075	0.005	8.401			
1999	DEC	0.048	0.077	0.034	0.025	0.565	----			1999	DEC	0.210	0.120	0.065	0.008	3.822			
2000	JAN	0.049	0.077	0.027	0.023	0.560	----			2000	JAN								
2000	FEB	0.043	0.065	0.021	0.020	0.650	----			2000	FEB								
2000	MAR	0.045	0.064	0.020	0.020	0.750	----			2000	MAR								
2000	APR	0.031	0.049	0.019	0.018	0.226	0.011			2000	APR								
2000	MAY	0.033	0.049	0.018	0.017	0.175	0.040			2000	MAY								
2000	JUN	0.042	0.059	0.018	0.017	0.197	0.003			2000	JUN								
2000	JUL	0.037	0.058	0.017	0.014	0.137	0.003			2000	JUL								
2000	AUG	0.043	0.062	0.015	0.013	0.212	0.001			2000	AUG								
2000	SEP	0.037	0.052	0.015	0.012	0.289	0.002			2000	SEP								
2000	OCT	0.039	0.054	0.015	0.016	0.255	0.005			2000	OCT								
2000	NOV	0.063	0.880	0.025	0.030	0.451	0.004			2000	NOV								
2000	DEC	0.087	0.120	0.033	0.036	0.484	0.005			2000	DEC								
2001	JAN									2001	JAN								
2001	FEB									2001	FEB								
2001	MAR									2001	MAR								
2001	APR									2001	APR								
2001	MAY									2001	MAY								
2001	JUN									2001	JUN								
2001	JUL									2001	JUL								
2001	AUG									2001	AUG								
2001	SEP									2001	SEP								

2001	**OCT**									**2001**	**OCT**								
2001	**NOV**									**2001**	**NOV**								
2001	**DEC**									**2001**	**DEC**								

APPENDIX – 2
Current Vehicle Inspection System

2.1 Vehicle Inspection for new registration of motor vehicles

- Brand new vehicles

For the purpose of new registration vehicles are weight at the head office to issue weight/ inspection certificate. Manufacture's specifications are used for the G.V.W.

- Used Vehicles.

Unladen weight and the G.V.W. of the foreign registration certificate are accepted to issue the weight certificate.

An inspection certificate is compulsory for the registration of motor vehicles except where special permission is granted for prototype approved vehicles. Prototype approved is the approval given to the agent appointed by the manufacture for a particular make and model.

Following details are entered in the weight/ inspection certificate, which are very important for the vehicle identification. Finally all the necessary data will be entered in the certificate of Registration.

1. Chassis number and its location.
2. Engine number and its location.
3. Wheel base/ overhang
4. Weight of the vehicle.
5. Make and model
6. Class of vehicle.
7. Engine, Engine capacity
8. Axles.
9. Wheels & Tires
10. Fuel
11. Color of body
12. Type of body
13. Body construction & material used
14. Length Width Height
15. Drivers cab Type of construction
16. Number of passengers/ G.V.W.

Inspection items are as follows.

All the standards related to the following items are specified in the MAT and its regulations (Govt. Gazette of 31.1.1952 and 12.5.1983 etc.)

Structure
Tires
Wheels
Suspension
Engine
Fuel System
Exhaust system
Transmission
Service brake
Parking brake
Steering System
Body
Windscreen & windows

Head lamps
Other lamps
Direction indicators
Horn
Reflection
Mirrors
Speedometer
Trailer coupling
Other items such as crash bars etc.

Finally check whether the vehicle is conformed to Motor Traffic Act and its regulations.