بسم الله الرحمن الرحيم

Pakistan

8th REGIONAL ENVIRONMENTALLY SUSTAINABLE TRANSPORT (EST) FORUM

19-21 Nov 2014, Colombo, Sri Lanka

Pakistan
(Country Paper)

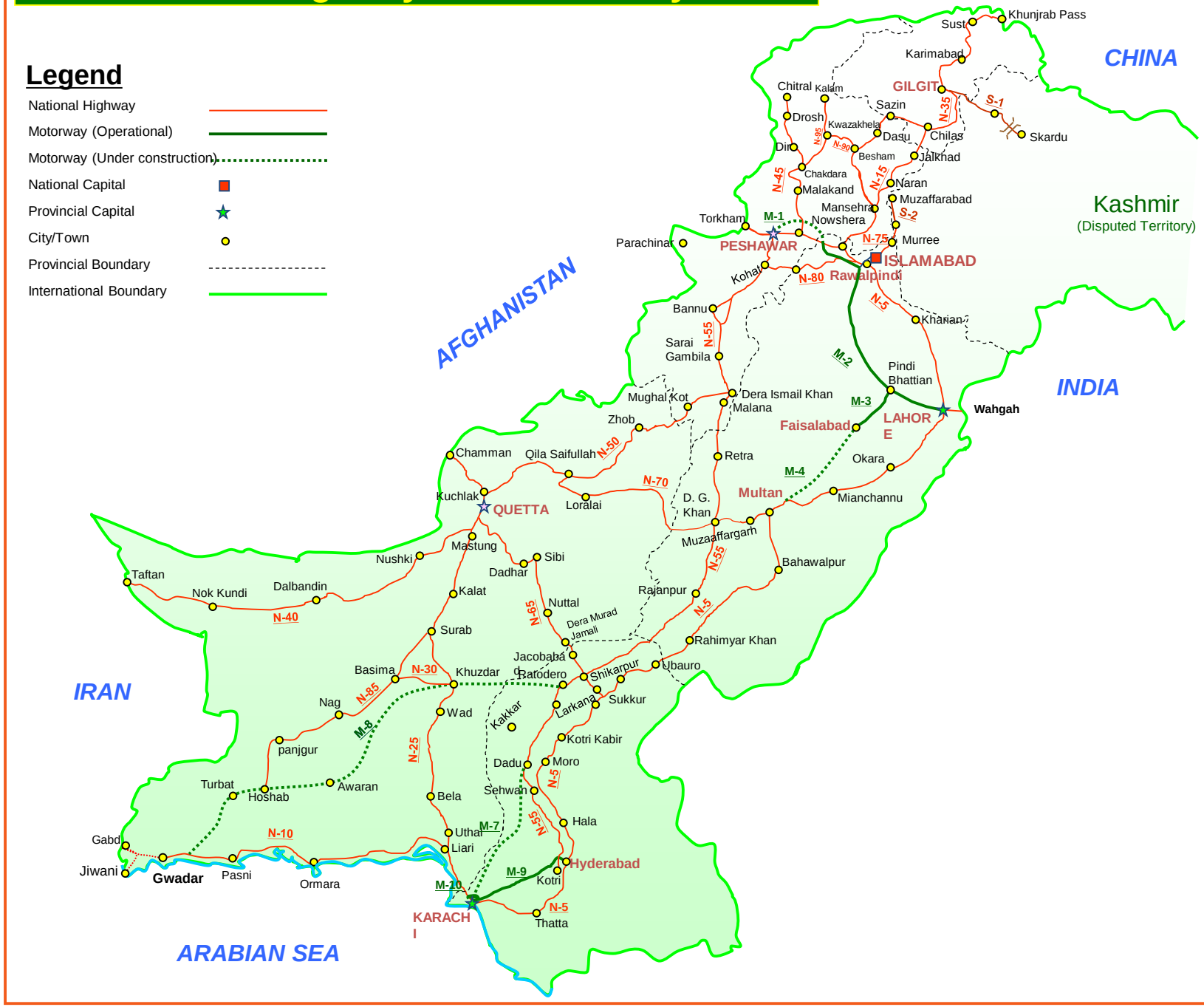
CONTENTS

INTRODUCTION

PAKISTAN

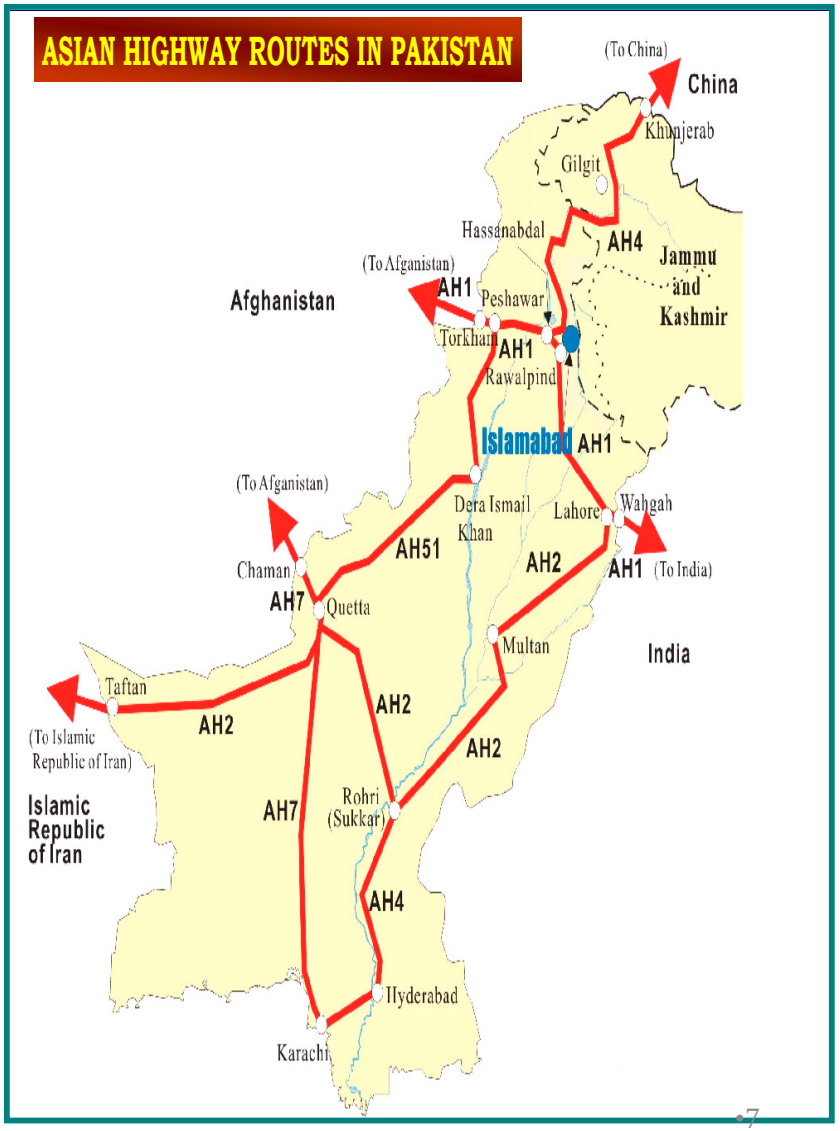
- **Area = 796,096 Sq- km**
- **Population = 180 million (Est: 2010)**
- **Total Road Network = 260,000 kilometers**
- **National Highways & Motorways = 12,000 Kms**
- **Roads have dominant share in both transport of passengers (94%) and the Goods (97%) followed by rail.**
- **Total Number of Vehicles are more than 9 .7 million**
  - **56% are two Wheelers and 44% four Wheelers (including Cars)**
  - **Annual Cumulative Growth rate over 2000-14 is 9.3%**
  - **Karachi, the largest city has two ports- Karchi port and port Qasim with road and rail linking to upcountry North**
  - **Third port i.e. Gawadar port near Iranian Border operationalized to further facilitate and enhance movement of transit-traffic.**
- **The country offers the most attractive transit route to the land locked Central Asian countries.**

National Highways and Motorways



CROSS BORDER ROAD TRAFFIC

- **Almost 95% of trade is sea-borne and volume of cross-border road traffic is very low at present.**
- **Only Torkham (Border with Afghanistan) has higher level of traffic with almost 400 vehicles a day and 700,000 tons of goods per year. This constitutes almost 70% and 50% of the total cross-border traffic of vehicles and goods tonnage respectively.**
- **International transit traffic is expected to increase manifold in the near future under bilateral and multi-lateral trade Agreements**



POPULATION OF MAJOR CITIES OF PAKISTAN

Total population of Pakistan = 180 million				
S.No.	**CITY**	**1998 CENSUS**	**ACGR(%)**	**2014**
1	**KARACHI**	9,339,023	3.49	15,623,461
2	**LAHORE**	5,143,495	3.32	8,395,069
3	**FAISAL ABAD**	2,008,861	3.58	3,404,776
4	**RAWALPINDI**	1,409,768	3.43	2,338,005
5	**MULTAN**	1,197,384	2.93	1,846,558
6	**HYDERABAD**	1,166,894	2.62	1,719,933
7	**PESHAWAR**	1,132,509	3.79	1,978,674
8	**GUJRANWALA**	982,816	3.29	1,597,152
9	**QUETTA**	565,137	4.09	1,031,072
10	**ISLAMABAD**	529,180	5.70	1,215,425
	TOTAL	**23,475,067**		**39,150,127**

PRODUCTION AND IMPORT OF VEHICLES, CARS AND BUSES

S. No.	Year	Motorcycles	Cars	Buses
1	2004-05	455,307	188,200	3,973
2	2005-06	760,866	194,719	2,191
3	2006-07	919,293	199,677	2,738
4	2007-08	1,003,302	328,099	1,669
5	2008-09	1,266,849	706,325	1,677
6	2009-10	1,114,356	510,961	1,906
7	2010-11	1,853,611	810,665	1,351
8	2011-12	1,898,407	1,774,665	1,565
ACGR (%)				
	2008-2012	14.4	35.9	-2.3
	2004-2012	22.6	37.8	-12.5

ON ROAD MOTORCYCLES, CARS AND BUSES

(000 Number)

YEAR	MOTORCYCLES	CARS	BUSES	ALL VEHICLES
2001-02	2,218.90	946.3	86.80	4471
2002-03	2,481.10	1083.4	96.60	5016.8
2003-04	2,656.20	1154.4	98.30	5315
2004-05	2,882.50	1240.9	100.40	5711.2
2005-06	3,063.00	1316.5	102.40	6048.3
2006-07	3,791.00	2064.9	102.60	7084.5
2007-08	4,463.80	1767.6	108.40	8063.6
2008-09	5,037.01	1936.33	109.88	8878.5
2009-10	5,368.00	2108.1	111.10	9413.7
Avg. %age Compostion (2000-10)	**53**	**23**	**2**	100
ACGR (%)	**11.7**	**10.5**	**3.1**	**9.8**

AVERAGE SUSPENDED PARTICULATE MATTER (PM2.5) IN MAJOR CITIES

Average Suspended Particulate Matter (PM2.5)		
S.No	**City**	**Level ug/m3**
1.	Islamabad	73.0
2.	Lahore	121.8
3.	Karachi	53.2
4.	Peshawar	70.2
5.	Quetta	47.1
6.	**Safe Limit**	**35.0**

ANNUAL MEAN VALUE OF DIFFERENT POLLUTANTS FOR MAJOR CITIES OF PAKISTAN 2007-09

City	YEAR	O3	NO2	PM 2.5	CO	SO2
		ug/m3	ug/m3	ug/m3	mg/m3	ug/m3
	2007	40.94	49.85	79.35	1.96	5.88
	2008	47.03	41.76	73.21	1.18	4.65
ISLAMABAD	2009	51.99	48.72	59.28	1.05	12.71
	2007	39.45	46.60	137.02	1.85	56.74
	2008	40.99	37.15	113.35	0.84	67.16
LAHORE	2009	46.27	54.06	54.81	1.58	93.02
	2007	34.36	55.38	99.76	1.88	47.49
PESHAWAR	2008	41.62	52.18	98.78	1.44	26.31
	2009		46.82	54.81	1.09	33.52
	2007	14.27	45.95	95.89	0.30	36.47
	2008	26.83	38.39	66.89	0.45	21.40
KARACHI	2009	13.42	54.84	60.86	0.08	43.15
	2007	34.68	42.20	68.94	1.45	26.70
	2008	44.48	33.25	55.64	1.05	42.58
QUETTA	2009	51.35	34.78		0.90	73.09
US Environmental Standards*		235.00	100.00	35.00	10.00	365.00

*Environmental Quality Standards for Pakistan are in the process of preparation

SALIENT FEATURES OF INTERCITY/URBAN TRAFFIC

- Intercity Traffic
  - Road based passenger traffic 92%
  - Road based goods traffic 96%
  - Remaining is rail based with share of air traffic to the tune of 1%
- Urban Traffic
  - Almost 100% of passenger and goods traffic carried by road being operated in private sector.

SALIENT FEATURES OF INTERCITY/URBAN TRAFFIC contd…

- Personalized modes of transport (Motorcycles, Cars) although on the increase mainly due to the lack of high quality public transport system, have registered a decrease in the rate of growth.
- Due to reliance on old buses and light commercial vehicles, less stringent emission standards and lack of enforcement, air pollution along busy roads and narrow streets is greater than would be predicted from the number of vehicles on the road in the developed countries.

SALIENT FEATURES OF INTERCITY/URBAN TRAFFIC (contd…)

- Although car ownership is still low (approximately 13/1000 population), due to concentrated nature of traffic movements in the urban context, the problem is much more exacerbated as compared to the intercity routes.

URBAN TRAVEL AND ROAD CAPACITY

It is estimated that:

- For 11.7% persons travelling in car/taxis, 47.8 % of road capacity is used.
- For 60% persons travelling in mini-buses/buses, 17.3% of road capacity is used.
- If no buses, 220% of road capacity would have been required.
- If all buses, only 25% of available road capacity would be required.

- Thus congestion is mainly caused by cars and is responsible for major infrastructure investments for increased road space, parking etc. besides inflicting externalities.

2. PROGRESS IN ENVIRONMENTALLY SUSTAINABLE TRANSPORT (EST)

PROGRESS IN EST

- As regards the introduction of environmentally sustainable transport (EST), a visible progress has been made in the conceptual domain which has manifested itself in the formulation of well-defined policy and national conservation strategy leading to identification and implementation of some of the high priority actions.

USE OF CNG

- For minimizing the vehicle emissions various measures include the :
  - Incentives to adopt CNG through price differential with Petrol.
  - Policy has shown remarkable results as Pakistan at present is the 2nd largest CNG user country in the world.
  - 2.4 million vehicles are using CNG which is approximately 25% of total number of vehicles on road even exceeding the MDG target of 920000 vehicles set for 205 as tabulated below:

Name of sector	Physical Targets of MTDF Period			Achievement 2010
	2004-05	2009-10	MDG Targets 2015	
No. of Petrol & Diesel vehicles using CNG	380,000	800,000	920,000	2,400,000

PROGRESS IN EST (contd…)

- Initiative has been taken in the form of Lahore **Metro Bus Service** (LMBS)
- It is BRT system operating on a dedicated route.
- The length of first corridor is 27 km.
- Articulated Buses are operating with a frequency of two minute during peak hours .
- Daily bus ridership on metro service is 130,000 passengers.
- Currently 115 buses are operating .

PROGRESS IN EST (contd…)

- Comprehensive urban transport studies have been conducted in major cities notably Karachi & Lahore.
- Keeping in view the fact that almost the entire public transport system is owned and operated by the private sector, the essential 'ingredients' are as under:
  - An intermediate tier in the form of public private partnership (PPP) has been introduced to speed up the process . This includes other modes of financing like BOT with its variations.

PROGRESS IN EST (contd…)

- Institutional Arrangement
  - Government emphasis on regulatory role.
  - Provincial Transport Departments to play the lead role (PPP/BOT etc, registration, licensing, vehicle fitness).
  - Regional Transport Authorities (RTAs) / Executive District Officers (EDOs) are strengthened and manned by professionals.

PROGRESS IN EST contd…

- ‘Package Approach’
  - Different modes of urban transport & allied infrastructure to be dealt as a system.
  - Buses are the most basic form of urban mass transit making use of existing road infrastructure and have been assigned top priority.
  - Regulatory/restraint measures on personalized modes of transport are being adopted.
  - City / District Governments to provide adequate depots, park and ride facilities, Bus Terminals, market based fare enforcement on routes etc.

PROGRESS IN EST contd…

- Cities with population of more than 500,000 to have proper urban transport system .
- Dedicated Mass Transit Systems are un-avoidable where level of traffic exceeds 20,000 persons / hour / direction
- Policy to tackle issues in terms of capital cost, operating costs, affordable fare structure and capital / operating subsidy – Sharing formula (Federal /Provincial /District Governments) is under preparation.

PROGRESS IN EST (contd…)

- Efforts are underway to strengthen existing railway system to serve urban and sub -urban traffic in major cities.
- Inter-modal changes to ensure minimal time penalty & out-of-pocket expenses for the users.

- The concept of integrated land use planning has a very limited scope in the already developed cities. However, an attempt is being made to adopt this concept in newly developed Urban settlements/developments e.g. Bahria Town, Defence Housing Authority etc.
- Presently, the progress is slow as these have to be implemented through public private partnership with major financing from the private sector.

- As regards walking and non-motorized means of transport, the extreme weather conditions and the undulating topography are some of the major hurdles to a wide scale adoption of these means. The temperatures range from as low as -2 C during winters to as high as 51 C during summers. Despite the above, emphasis is being laid on providing ‘continuous’ walk ways along major roads and intersections for safe crossings.
- Regarding Transport Demand Management, both the fiscal and physical measures are being taken like the linking of fuel prices with international oil prices, introduction of parking fees etc.
- The animal driven vehicles have almost been completely replaced by auto-rickshaws.

- Improving Fuel Quality & Minimizing Emissions
  - As against the existing standards, higher specifications are invariably followed by vehicle manufacturers.
  - Conversion of two stroke engines to four stroke engines.
  - Replacement of Diesel/Petrol by CNG which has lower emissions than Diesel/Petrol driven cars and vehicles.
  - Eliminating lead from Petrol and sulphur from Diesel.
  - Besides R & D activities have been initiated to develop alternative fuels like Ethanol-Gasoline Mix, Ethanol-Diesel Mix, Alcohol/Bio-Ethanol and development of hydrogen technologies.

- **Devolution of Powers to Provinces**
  - With the devolution of Powers in certain subjects like ‘ mechanically propelled vehicles’ to the provinces through 18th Amendment in April 2010, the provinces are expected to adopt fast track measures for improving the vehicle registration system, Annual vehicle inspection and maintenance requirements especially for public transport vehicles, introduction of efficient public transport systems.
  - E-registration initiatives have been taken by the provinces Punjab, and Khyber Pakhtoon khwa with other provinces to follow the example.

- Terminal / Parking Facilities
  - Terminal / Parking facilities (Convenient places , Nominal rent, Responsibility (District/ City government)
  - Bus bays and bus stops (Minimum stoppage time, Ensure Passenger safety, Proper bus schedules and effective enforcement)
  - Embarking and disembarking of intercity passengers (Convenient locations, Integrated with the local urban transport system)
  - Adequately charged Parking Facilities.

Environment Protection Post 18th Constitutional Amendment

- **THE SUBJECT OF ENVIRONMENT IS DEVOLVED, SO THE FUNCTIONS OF FEDERAL GOVERNMENT AND PROVINCES**
- **LABORATORIES (CLEANS) HAVE BEEN DECENTRALIZED TO PROVINCES. HOWEVER PAK-EPA IS LOOKING AFTER THE AIR QUALITY OF FEDERAL CAPITAL TERRITORIES.**
- **CONTINEOUSE MONITORING STATION (CMS) (FIXED /MOBILE) MEASURES 08 PARAMETERES i.e SOX, NOX, METHYL HYDROCARBON / NON METHYL HYDROCARBON , OZONE , CO , PM_{10} / $PM_{2.5.}$**
- **MANUAL MONITORING OF AIR QUALITY : HIGH VOLUME AIR SAMPLOR/ MINIVOLUME AIR SAMPLOR FOR TSP AND PM . FOR GAS PARAMETERS BY PASSIVE SAMPLORS / ACTIVE SAMPLOR SUCH AS IMPINGER TUBE.**
- **STACK EMISSION MONITORING DUST MONITORING (ISOKINETIC) , GASEOUS MONITORING BY PG 250 GAS ANALYIZER.**

- Roadway Facilities
  - Proper attention to
    - Road Geometry
    - Adequate roadway facilities
    - ‘Walking’ - a composite mode of transport
      - Continuous/ walking paths
  - Traffic Engineering Units with adequately trained manpower
- Safety
  - Preventive and curative measures to minimize road accidents including adequate compensation to accident affectees on a ‘no-fault’ basis .
  - Adequate pedestrian crossing facilities

- Vehicle Registration, Motor Vehicle Examination, Driver Training and Driving Licenses
  - Vehicle Registration (Computerized record)
  - Vehicle transfers (Meticulously checked)
  - Motor Vehicle Examination (still needs Effective Revamping)
  - Ensure Vehicle Fitness (Standardized Check-lists, Testing Equipment)
  - Motor Vehicle Examiner (Mechanical / Auto Engineer)
  - Driver Instructor Training and Driver Training Schools.
  - Proper Licensing System

VEHICULAR EMISSION & PAKISTAN ENVIRONMENT PROTECTION ACT, 1997

- **Prohibition of certain discharges or emissions (NEQS).** Section 11 of PEPA, 1997

  No person shall discharge or emit any effluent or waste or air pollutant or noise in an amount or level which is in excess of the National Environmental Quality Standards.

- **Regulation of motor vehicles (Section 15).**

  No person shall operate a vehicle from which air pollution or noise are being emitted in excess of NEQS limits. Smoke opacity not to exceed 40% or 2 Ringlemann Scale or equivalent smoke number

INITIAL ENVIRONMENTAL EXAMINATION (IEE) AND ENVIRONMENTAL IMPACT ASSESSMENT (EIA):

Section 12 of Pakistan Environment Protection Act, 1997

No proponent of a project shall commence construction or operation unless he has filed an IEE with Environmental Protection Agency or where the project is likely to cause an adverse environmental effects an EIA, shall be obtained from the Agency.

IEE/EIA REGULATION 2001

- **SCHEDULE I (Regulation 3)**

Following projects will require IEE as given in Schedule I.

- **E. Transport**
  - **1.** Federal or Provincial highways (except maintenance, rebuilding or reconstruction of existing metalled roads) with total cost less than Rs.50 million
  - 2. Ports and harbor development for ships less than 500 gross tons

- **SCHEDULE II (Regulation 4)**

Following projects will require EIA as given in Schedule II.

- **D. Transport**
  - 1. Airports
  - 2. Federal or Provincial highways or major roads (except maintenance, rebuilding or reconstruction of existing roads) with total cost of Rs.50 million and above
  - 3. Ports and harbor development for ships of 500 gross tons and above
  - 4. Railway works

AIR POLLUTION MONITORING

- **Air pollution survey was conducted on ground level at 26 different traffic junctions in Peshawar city during day time.**
- **Average carbon monoxide level at traffic junctions is 17 PPM as compared to the WHO standard of 9 PPM for 8 hours exposure.**
- **The dust level in the city is 10 times above the WHO level.**
- **Different people are exposed for different duration depending on their location of residences, businesses and type of jobs (traffic police, drivers, shopkeepers etc).**

VEHICULAR EMISSION

- **Vehicular Emission Testing Station (VETS) was established in 1997. It is the only emission facility working in the country for the last ten years on self sustainable basis by charging Rs.100 per vehicle test.**
- **3 mobile units are working since 2001. VETS Peshawar have checked 3,33,657 vehicles in which 1,86,192 were passed & 1,47,465 vehicles did not comply with the Emission Standards.**
- **Mingora Station has started function in 2005-2006 & has checked 2981 vehicles while staff for Abbotabad VETS has been selected and EPA planning to establish VETS in DI khan, Bannu, Kohat, and Mardan.**

CENTRAL LABORATORY FOR ENVIRONMENTAL ANALYSIS AND NETWORKING (CLEAN)

- Pakistan Environmental Protection Agency has established Central Laboratory for Environmental Analysis (CLEAN).
- CLEAN is equipped with state-of-the-art computerized analytical equipment. The Laboratory has facilities for analyzing pollutants in air, water and soil beside toxicity levels in food stuffs and other products.
- CLEAN has its regular environmental investigation programmes for air, water and soil pollution.

CENTRAL LABORATORY FOR ENVIRONMENTAL ANALYSIS AND NETWORKING (CLEAN)

3. FUTURE COURSE OF ACTION

FUTURE COURSE OF ACTION

- Future policy/strategy takes into account the fact that since the entire public transport is in the private sector, the financial sustainability of any mode of Transport is an important pre-requisite for it to stay in the market. The future policy and strategy is based on the following transport policy stipulate:
    - Provide safe, reliable, effective, efficient, affordable, accessible, sustainable and fully integrated transport system that will best meet the needs of freight and passenger access and mobility requirements while being environmentally, financially and economically sustainable and energy efficient.

FUTURE COURSE OF ACTION

- The Action Plan is mainly geared towards the achievement of:
  - Quantified assessment procedures & corrective measures
  - Minimizing Motorcycles/car travel and modal shift in favour of Public Transport vehicles with improved fuels.
  - A very strong collaborative arrangement with all the stakeholders
  - An effective enforcement apparatus
  - A ‘Package Approach’ to deal with different modes of urban transport and allied infrastructure as a system with full regard to a better environment.

THANK YOU