PRESENTATION ON
HIGHWAY SAFETY IN PAKISTAN IN CONTEXT OF OVERLOADING

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Highway/Road Safety

- Safety is of prime importance, not only to the users but also to engineers, planners and decision markers associated with operation, improvement and development of transportation system.

- The traffic safety problem on our roads has registered a very sharp increase during recent years.

- There are a number of administrative, legal, technical, socio-economic and cultural reasons for it.

- There is urgent need for carrying out research in fundamental aspects of the problem to make sure the problem is being tackled properly.
Traffic Safety Problem World Wide (Revised World Bank Data)

- Between 750,000 & 880,000 deaths worldwide in 1999
- 85% in the developing & transitional economies countries
- 50% in urban area
- Between 25 & 35 Million people were injured worldwide
- 75% were in urban area
- More than 50% occur at junctions
- Economic Cost
- Annual Cost US$80 Billion
- About 2% of the GDP
FATALITY RATE COMPARISON

Countries

Fatalities/10,000 Vehs

1. Ethiopia
2. Zambia
3. Nepal
4. Bangladesh
5. Cameroon
6. Kenya
7. China
8. Botswana
9. Zimbabwe
10. Niger
11. Pakistan
12. India
13. Ecuador
14. Morocco
15. Tunisia
16. South Africa
17. Colombia
18. Sri Lanka
19. Indonesia
20. Hong Kong
21. Malaysia
22. Singapore
23. USA
24. Australia
25. Japan
26. Finland
27. UK
28. Norway
The table shows that most of the injury & damage only accidents stay unreported

JICA Study March 2004
FOUR E'S OF HIGHWAY SAFETY

- **Engineering:** Making roads safe and fast by incorporating engineering improvements such as separation of grades and carriage-ways, installation of signs, signals and road markings to guide the road users along their travel paths with speed and safety.

- **Education:** Educating the road users in the rules of the road to inform them of their rights and limitations as road users, to prevent them from creating a situation hazardous to themselves and to other road users.

- **Enforcement:** Preventing violation of the rules of the road by the road users by organizing a very effective enforcement agency.

- **Environment:** Minimised environmental pollution during construction/Rehab/maintenance.
SOME FACTS ABOUT PAKISTAN

- Probably over 7000 people die in Pakistan every year in road accidents

- Total cost is estimated to be about a billion US $ every year

- Even material costs exceed US $200 Million per year

- Those who die & suffer injuries are the most active and educated citizens

- This is 40% more than in Turkey, where vehicle fleet is much bigger

- In 12 years time, the number of accidents will grow from 300,000 to 700,000, resultantly the accident costs from US $ 1 billion to US $ 2.5 billion and the annual number of fatalities will grow from 7000 to 14000, which is an increase from 20 to 40 deaths per day
ANNUAL FATALITIES GROWTH

Growth of Annual Fatalities in Pakistan

Year

Fatalities/Year
MODAL SHARE – PAKISTAN TRANSPORTATION

95% 90%

5% 8% 0% 2%

Freight Traffic
Passenger Traffic

ROAD
RAIL
AIR
Role of Road transportation in Pakistan & Present Condition of National Highways

- Of the three primary transportation modes (road, rail, air), road transportation overwhelmingly dominates the two transport systems.
- 107000 million ton kilometers of freight annually compared to 5000 ton kilometer & 25 million ton kilometer by rail & air respectively.
- 90% passenger traffic as compared to 8% and 2% by rail & air respectively.
- Roads are the backbone or lifelines of Pakistan economy.
- Total Length of road network in the country is approximately 250000 KMs
- 145000 Kms of Paved roads (High type)
- 105000 Kms of gravel roads (Low Type)
- Length of the National Highways is about 9000 Kms
- **Though the length of National Highways is only 3.5% of the entire road network of the country, but they carry more than 80% of the country’s traffic**
Condition of National Highways

- With the growth in traffic volume & axle load levels, and inadequate maintenance, the large asset investment is deteriorating at an alarming rate.
- The result of the Pavement condition surveys conducted in year 2000 by NHA show that 50% of the existing NHA network is need of the major rehabilitation or reconstruction. The remaining 50% will be lost in the near future if adequate maintenance & rehabilitation actions are not taken in a timely & effective manner.
- The cracking data shows that 76% of the NHA’s network has cracked.
- High to very high severity level cracking exists on approximately 41% of the network and 58% of the NHA network has rutted, severity level rutting exists on approx. 27% of the network.
- Results of the 2000 Pavement roughness survey made according to International Road roughness (IRI) criterion show that 74% of the NHA network has an unacceptable.
- An HDM/EBM study conducted in year 2000 by a joint team of NHA and the World Bank suggests that spending Rs 6 Billion per year can improve the ride quality of NHA network to an acceptable standards in a six year period, this strategy will result in a saving of Rs 24 Billion (NPV) in road transportation costs alone.
Present condition of National Highways

- **Root cause of the present situation**
  - The present situation of the road network is due to disinterest political expediency) and neglect (unawareness of economic consequences of deferred & /under funded maintenance). These two factors resulted in a tendency that promoted disproportionate budgeting that resulted in a vast imbalance in development & maintenance expenditure.
  - NHA annual development expenditure has seen a manifold increase since the 1990’s, whereas its maintenance allocations have stagnated at less than 4% of the annual development budget. Consequently the gap between the maintenance funds demand & allocation has broadened every passing fiscal year.
  - The proportion of maintenance allocations actually released has declined sharply during the last decade, from almost 60% to just over 20% of the allocated amount.

- **Recognition of the Problem**
  - The Government of Pakistan recently realized that if it continues to neglect maintenance & rehabilitation, the remaining road network will also crumble prematurely and the associated avoidable costs will form a formidable obstacle to the socioeconomic development of Pakistan.
Different Trucks carrying different Axle Loads

- 2–axle trucks, 61%
- 3–axle trucks, 22%
- 3–axle trailer, 4%
- 4–axle, 7%
- 5 & 6–axle, 6%

PERCENTAGE OF FREIGHT VEHICLES BY COMPOSITION
PERCENTAGE OF FREIGHT VEHICLES BY COMPOSITION

- Overloaded % in case of 2 & 3 axle, 70%
- Overloaded % in case of 4, 5 & 6 axle, 40%
- % Increase in Freight Vehicles, 4%
Overloaded heavy vehicles are destroyers of roads and are traffic safety hazards. Around 90% commercial vehicles carry more than the allowable standard axle load i.e. 12 ton/axle. The primary reason for overloading the overwhelming presence of two axle trucks, which accounts for 70% in the overall truck fleet presently plying on the roads in Pakistan. To cater for the overload, the truck drivers make structural changes along with tyres inflation much more than the allowable tyre pressure i.e. 120 psi.
HISTORICAL BACKGROUND

- TRUCK FLEET GROWTH

- 1950 - 1998

- 4000% !
LOAD FACTOR COMPARISON
DAMAGE CAUSED BY PASS OF

1 PAKISTAN TRUCK
(2 Axle) = 22 USA TRUCKS
LOAD FACTOR COMPARISON
DAMAGE CAUSED BY PASS OF

- 1 PAKISTAN TRUCK (3 Axle)

= 12 USA TRUCKS
ADVERSE EFFECTS

Structural:

- Premature “Fatigue Cracking” and “Shear Deformation” in the pavement.
- 2,000 KMs of Asphalt work done on various sections of N-5, N-55 and M-2 since 1997 have completed their design life within a short timeframe of 5 years.
- 1,400 KMs require Rehabilitation.
- 2,000 KMs require Overlay
ADVERSE EFFECTS

Safety:

- Obstruct Sight Distance
- Difficulty in Overtaking
- Effect on Breaking Distance
- Difficulty in Maintaining the Average speed thus causing traffic congestion
THE RESULT
WHAT IS AT STAKE

- ROAD ASSET WORTH OVER Rs. 2.5 TRILLION
- HIGH TRAVEL COST TO ECONOMY
- ROAD SECTOR INEFFICIENCY CAUSING A LOSS OF Rs. 240 BILLION OR 6.8% OF THE GDP
- 70 FATALITIES PER MILLION CAUSING Rs. 40 BILLION
- DELAYED ECONOMIC ACTIVITY & POVERTY ALLEVIATION
- OTHERS .............
MESAURES TAKEN

- Creation of National Highways & Motorway Police
- National Highway Safety Ordinance (2000)
- Tolling on Highways and Motorways for Adequate Maintenance Funds
- Improved Road Geometry
- Dualization of Main Arteries of the Country
- Holding of International Road Safety Seminars/workshops
- Revision of MVO (19965/69) under Consideration
- Provision of Multi Axle Trailers to the Transporters at affordable cost to minimise usage of 2-3axle trucks
THANK YOU