road transportation,
traffic congestion,
transport

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ROAD TRANSPORTATION PROBLEMS IN DEVELOPING COUNTRIES

Better transportation system is a basic need, not only of developed countries but also for developing countries. The context of the paper is based on traffic congestion, motorization problems, specification, and growth in transportation demand. Like these problems are described in detail to focus genuine and basic reason. This work is focusing on reasons of transportation problems and their examples and concerned factors. In addition to travel time, safety, energy and environment; public health is also an important issue that should be considered as a side effect of a transportation system.

PROBLEMY TRANSPORTU KOŁOWEGO NA PRZYKŁADZIE KRAJÓW ROZWIJAJĄCYCH SIĘ

Transport kołowy jest istotnym w komunikacji zarówno w krajach zaliczanych do rozwiniętych jak i rozwijających się. Przedmiotem wypowiedzi jest analiza wybranych problemów w transporcie kołowym w krajach rozwijających się na wybranym przykładzie. Uwagę zwrócono między innymi na zagadnienia intensywności potoków ruchu i ich źródła w aspekcie wzrostu gospodarczego tych krajów i szybkich przemian społecznych.

1. INTRODUCTION

Better transportation system is a basic need, not only of developed countries but also for developing countries. The quality of transportation system is dependent on technical expertise, employer performance, passenger awareness and solution for problems and risks of any events. The transportation land problem will be discussed on Pakistan example. Pakistan is a developing and the sixth most populated country in the world. It has all mode of transportation systems (road, railway, naval etc) each of it have its own importance.

Transport is an important sector of Pakistan's economy as it contributes about 10 % to the Gross Domestic Product (GDP) and over 17 percent to the Gross Capital Formation. It is estimated that about 2.3 million people (6 % of the total employed labor force of Pakistan) earn their livelihoods from this sector. Transport consumes 35 % of the total

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commercial energy annually and receives 20-25 % of the annual federal public sector development funds. The road sector has been the main recipient of these funds consuming about 69% of the PSDP allocation for Transport and Communication sector [6].

Pakistan has a total road length of 260,000 km out of which 60 % is paved (high type roads) while rest is unpaved (low type roads). Out of the total road length, 9000 km or 4 % of the length is comprised of national highways and motorways but these roads carry 90 % of the total traffic in the country. The road density in Pakistan is 0.32 km/square-km compared to more than 3 km/sq-km in Japan and 1 km/sq-km in India.

2. TRAFFIC CONGESTION

Traffic congestion is a condition on networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased queuing. The most common example is the physical use of roads by vehicles. When traffic demand is great enough that the interaction between vehicles slows the speed of the traffic stream, congestion is incurred. As demand approaches the capacity of a road (or of the intersections along the road), extreme traffic congestion sets in. When vehicles are fully stopped for periods of time, this is colloquially known as a traffic jam (Figure 1).

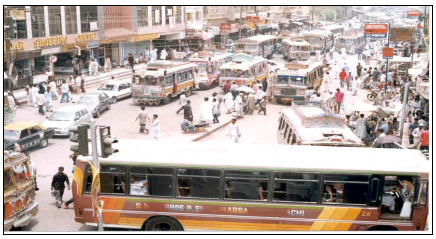

Fig. 1. Traffic Congestion

Traffic congestion occurs when a volume of traffic, demand for space greater than the available road capacity; this point is commonly termed saturation. There are a number of specific circumstances that cause congestion; most of them reduce the capacity of a road at a given point or over a certain length, or increase the number of vehicles required for a given volume of people or goods.

It has been found that individual incidents (such as accidents or even a single car braking heavily in a previously smooth flow) may cause ripple effects (a cascading failure) which then spread out and create a sustained traffic jam when, otherwise, normal flow might have continued for some time longer. Congestion studies show that about half of traffic delay is nonrecurring, attributable to temporary disruptions of the transportation system like traffic incidents, work zones, poor weather, and special events. Figure 2 shows that the other half is recurring congestion, delay that occurs in the same place at the same time day after day.

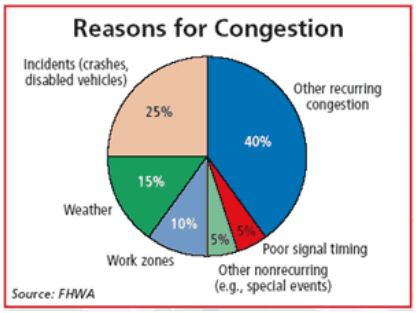

Fig. 2. Reasons for Congestion [4]

There are numerous reasons for traffic congestion in Pakistan; some of these are listed here:

I. Road Construction: The road construction works are in progress on M.A. Jinnah Extension Road, Rashid Minhas Road, Shahrae Jahangir, 5000 Road in North Karachi, 8000 Road in Korangi Manghopir Road etc. The flyover works are ongoing at Time Medico intersection, Hasan Square intersection and Sohrab Goth; Underpasses works are also underway at Ghaziabad, Liaquatabad No.10 and Nazimabad No.2. Most of the projects are on going without any traffic diversion plan.

II. Encroachments: Squatters have also set up encroachments on the roads. The car showroom owners park their vehicles at footpath and on a large portion of M. A. Jinnah Extension Road, Khalid Bin Walid Road, Tariq Road, and University Road etc. Inter-city buses have illegal depots and stop points along University Road (old sabzi mandi) causing hindrances in traffic flow.

III. Manual Traffic Control: Police officials who try to control the traffic manually switch off Traffic signals in many areas. They get confused in the process and due to their errors; the traffic from different directions is grid locked which leads to traffic muddle on the roads. Usually, the traffic police close the traffic signals in evening when traffic volume from all directions is much higher. They open one-side of road for long period while the other traffic is closed for minutes. Ironically, the signals are operating under Urban Traffic Control (UTC) in which timings are fixed in according to the traffic flow of these roads. The city government has installed 130 UTC signals on major roads, which have computerized system. Timings are stored in the system in according to the traffic volume, which can also be varied. According to city government officials, the traffic police was responsible to operate these signals but instead of it they were more intended to operate traffic manually. The city government has asked traffic police department many times to abandon traffic control manually as it causes traffic jams but the officials concerned never response positive.

IV. Lack of Civic Sense: Another major reason for traffic jams and mishaps in Karachi is lack of civic sense in drivers. Most drivers are either unaware of traffic rules or they simply do not bother. Jumping lanes, overtaking, speeding, cursing and swearing, all causing frustration, depression and hypertension around them.

3. ROAD TRANSPORT SECTOR IN PAKISTAN

There has been tremendous growth in the automobile sector in the past five years. Vehicle production including cars, trucks, motorcycles, tractors, buses and other commercial vehicles, has sky rocketed from 195,791 units in 2001-02 to 998,592 units in 2005-06 (increase by 410%). Passenger cars and light commercial vehicles have seen substantial growth; from 50,000 units/year have grown to about 200,000 units/year (increase by 300 %). Motorcycles have had highest growth, increasing from 120,000 to 750,000 units/year (increase by 525 %).

With manifold increase in production of vehicles, an estimated more than 100,000 vehicles every year in the country in addition to imports of vehicles have choked roads, particularly in urban centers where scenes of traffic jams have become order of the day. According to automobile sources, the car production in the country have increased from 30,000 to more than 100,000 within a few years and this increase is still continuing at a great pace owing to car financing schemes initiated by banks and leasing companies. The car manufacturers are holding more than Rs 20 billion as advance money of the clients, waiting in the long list to get new cars. According to some car dealers, the number of imported cars will increase under the new relaxed rules of Central Board of Revenue.

In Lahore alone there are an estimated 0.8 million vehicles plying on narrow city roads while in Islamabad almost every third house has a car. The heavy influx of four-wheelers into Islamabad from Rawalpindi city carrying commuters every day is another story, the choked Islamabad roads on peak hours. Long queues of vehicles at Zero point junction, Faisal Chowk, roads crossing Quaid-i-Azam Avenue, main artery of the city can be witnessed daily. Murree road and Mall road in Rawalpindi are presenting the same picture. In Karachi, the situation is very precarious, as the commuters take hours together to reach their destinations. Long traffic jams on city roads have gone out of anybody's control. The other urban centres such as Peshawar, Faisalabad, Sialkot, Multan and Hyderabad are also facing the same situation. No authentic figure is available as to how much petrol, diesel, CNG and precious time of the people are being wasted on roads due to long traffic jams. Pakistan's oil import bill has crossed all previous records due to sudden rise of oil prices in international markets touching the figure of $ 55 per barrel. According to transporters in most of the countries an efficient and comfortable transport system is in operation where commuters generally leave their cars behind and use it to save energy and their daily expenditure.

The unplanned increase in cars is creating social and economic problems [1, 2]. Some sort of control over unplanned increase is must otherwise the roads will be completely blocked in the days to come. Official sources said, presently, the government has no plan to tackle this new emerging situation that has narrowed the country's roads. But the planning is must at every level to broaden the roads. The government has to encourage an efficient public transport system in cities to control the worsening situation.

Over half the national highways network is in poor condition, and the road safety record is poor. The country's truck fleet is mostly made up of obsolete, underpowered, and polluting vehicles, and trucks are often grossly overloaded. Truck operating speeds on the main corridors are only 40 – 50 kph for container traffic, half of the truck speeds in Europe. For trucks carrying bulk cargoes, the journeys take 3-4 times longer than in Europe.

In the country, most people do not use properly way of walking along with road or crossing the road. This causes disturbance only for vehicles but also for people. Many accidents are recorded while people crossing along with road. In addition, there are low numbers of Zebra crosses and people are compelled to cross road from any point. Highway and traffic authorities should increase quantity of Zebra crosses.

Public should be guided by highway or traffic authorities to use proper stop or pavement for waiting for bus, crossing the road and walking along the road respectively. Gradually, for last decade there is increase in number of walkman and vehicle but the volume of road and pavements remain the same. Now it is needed here to handle problem with certain rule to reduce any accident.

4. MOTORIZATION PROBLEMS

Rapid increase in the number of vehicles, lack of emission control technologies, low oil/ fuel quality, lack of enforcement and lack of awareness are major factors contributing to the air pollution levels in Pakistan. Without timely and effective measures to mitigate the adverse impacts of vehicular emissions, the' environment of Peshawar Metropole will continue to deteriorate and become increasingly intolerable.

Keeping in view this grave situation in Peshawar Metropolitan, the Environmental Protection Agency, Go NWFP with the Technical Assistance of Federal Republic of Germany through the GTZ (German Agency for Technical Cooperation) has Established a Vehicle Emission Testing Station (VETS) equipped with three sets of latest /modern sophisticated BOSJCH emission control technology units and well trained staff to test and analyze emissions of all kind of petrol and diesel vehicles.

This VETS is the beginning of a new chapter for vehicular emission control in Pakistan. The objectives of VETS are reduction of harmful emissions, better fuel/ engine efficiency, reduced maintenance requirements, and to test and identify vehicles, which are violating the notified National Environmental Quality Standards (NEQS). VETS was established 1st June 1997 and formerly inaugurated on 7th August 1997 by the Chief Minister NWFP. The first ever Vehicle Emission Testing Station since June 1997 is in full operation near Chamkani Chowk, Peshawar on self-sustainable basis. 3 mobile units are working since 2001. VETS Peshawar has checked 333.657 vehicles in which 186.192 were passed and 147.465 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.

Sometimes signals fail working during traffic flow and it cause serious misunderstanding among the drivers and it would very difficult for traffic police officer to handle huge vehicles alone. In addition, some major cities are not facilitated with signals.

New colonies and projects are built in big cities and many people come in big or industrial city like Karachi and settled for their whole life. According to survey, two thousand people come in Karachi each year for education or job purpose. And new project or colonies become their new home. But project owner do not communicate about the project properly to district officer, so that transportation system (road connect new colony to big city) would be planned in better way and in future, there would be no mismanagement on roads, streets, bus stops and many more. That issue can be only solved

after properly information, like structure and volume of project. Finally authority will have better plan for the scheme.

In Pakistan, no suitable attention is given towards taxi and bus stops. Always traffic congestion is found near those stops. Sometime taxi and rickshaw stops are settled inside main road of city, which also disturb the vehicles, and walkman. People also do not use bus stop properly and try to stop bus, taxi and rickshaw at any side of road without care of its stop. Some stops are not managed properly; it means the difference of distance between stops varies from 100 feet to 1 km.

In Pakistan, the most serious problems are that there is no schedule for public transportation. If you are traveling on public buses or vans, you don't know when you will reach your destination. Drivers remain at bus stops waiting for passengers, even though sitting passengers express anger because they are getting late.

Pakistani people visit relatives, living in another city on special days, like Eid ul Fiter, Eid ul Azha, New Year etc. Transport fares are doubled in private as well as public transport and authorities pay no attention and many passengers suffer great problem on each event. Another problem for those using public transport is that whenever the price of petrol increases, fares are also increases. However, when diesel prices go down, fares do not go down. People might be willing to pay more for bus and van fares if the service was better. Authorities must turn their attention to this issue and redress these problems.

For last many years government of Pakistan have taken many steps to improve the transport system. Few improvements have been observed but many small and big cities are still bearing problem of transport system. According to survey, it is intimated that expertise from developed countries are not workable in developing countries. Certain differences, like unavailability of local trains and schedule of bus are an example. The need is to understand specific solution of a problem. Only local expert can solve that, not just only by implementing developed countries expertise.

Most of transports (bus, train) are not reliable with respect to time. It means more time is taken by transport to arrive at destiny. It is because of no schedule, more stops and unplanned stay. If survey is taken, certain large number of accidents would be observed annually. Those accidents are result of technical fault, unawareness of rules and huge number of passengers.

5. GROWTH IN TRANSPORTATION DEMAND

With increase in population results in increase in transportation demand, but because of low resources, few alternatives are taken. Measures to be taken include:

- launching of effective awareness campaign against smoke-emitting vehicles,
- creation of public awareness and education,
- setting up of continuous monitoring stations to record pollution levels in ambient air,
- improvement of energy efficiency in vehicles,
- introduction of low - sulphur diesel and promotion of alternative fuels such as CNG (*Compressed Natural Gas*), LPG (*Liquefied Petroleum Gas*) and mixed fuels,
- review Motor Vehicle Ordinance for inspection of private vehicles,
- restrict conversion of vehicles from gasoline to second-hand diesel engines,
- stop import and manufacturing of 2-stroke vehicles,
- establish public/rapid transit systems, give tariff preference to CNG buses.

Pedestrians are essential to all Pakistani mobility. Low-income groups are particularly reliant upon it. Accidents involving pedestrians lend a particular urgency on the subject. The following actions are central to improving pedestrian mobility:

- greatly expand the number of pedestrian bridges crossing the principal and minor arteries,
- expand sidewalks where required in commercial districts, including commercial/business areas.

Pedestrian crossings are special features used to help pedestrians to cross a road. They should be installed where:

- visibility is adequate, the 85^{th} percentile speed is not too high, and
- no more than four lanes need to be crossed at any one stage.

Traffic engineering measures to reduce pedestrian crashes include: good footpaths, pedestrian malls, over bridges and underpasses, fences to channel pedestrians to marked crossways, special pedestrian facilities at traffic signals, special safety provisions at bus, taxi, and train stops, good peripheral lighting.

The performance of the transport system in Pakistan is not satisfactory largely owing to congestion, poor quality roads and ageing freight vehicles' fleet. The strategy of the government for the road development has been to invest in expansion without setting aside sufficient resources for maintenance. The road maintenance expenditures over the years have been only 20-30 % of the requirement. According to the World Bank's estimates, the inadequate and inefficient transport system is imposing a cost to the economy in excess of Rupees 220 billion annually or 8.5 % of the GDP constraining economic growth, access to services and export competitiveness. The poor quality of roads and non-tuned engines, contribute to high consumption of energy. The ENERCON Company has estimated that 20 % energy conservation in the transport sector can be achieved by just properly tuning the engines.

Hundreds of Compressed Natural Gas CNG stations have been installed in congested residential areas without giving any heed to planning or land use byelaws. At number of places, the lure for earning attractive profits by investing in the CNG sector has resulted in undue competition and concentration of CNG station in already overcrowded urban areas. On one hand these stations are causing traffic congestion, they are also posing public safety risks. The CNG sector needs to be managed properly in terms of issuing licenses in areas where there is an over-concentration of such stations. The older parts of Rawalpindi are obvious examples in this regard. The establishment of CNG stations in purely residential zones should be discouraged.

Motorist do not wear seat belt. There is currently no legislation mandating it. Motorway police and Islamabad traffic police has started awareness campaigns related to the seat belt. Most of the vehicles flying on road are old and not equipped with seat belts. Also use of cell phones while driving, walking and even motor-biking is increasing day by day.

6. CONCLUSION

The key to reduce a large number of the current problems in transport is to encourage the passengers to travel by collective transport modes and leaving the private car use. To achieve this target it is necessary to make the public transport more attractive than the private car and the way to get it is:

- to make the public transport system more efficient,
- allowing a larger number combination journeys, and so increasing possible users,
- reducing the time spent in travel,
- reducing the cost of travel,
- to promote and marketing the public transport system benefits.

For introducing a more competitive public transport than individual car transport and for relevant level quality providing for passengers, is necessary to determine relations which could ensure a documentary loss covering for the public transport and transporters also which could ensure minimal present level of transport service of city with progressive basis for integrated transport systems in the frame of region building.

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