



Sustainable Urban Transport Policy for Sindh

Draft

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1. Background

Sindh is one of the fast growing provinces of Pakistan. The average annual growth of population in Sindh is reported as 2.58%, which is higher than the average annual growth rate of the country (i.e. 2.54%)¹. The urbanization trends in Sindh also show an ever-increasing trend in the province. It is associated with high migration rate from other parts of the province to existing urban areas. In the year 2011, it was estimated that about half of the population in the Sindh province resides in the urban areas².

Unfortunately, this growth in population and urbanization has not been met with expansion of transportation network and services. Lack of efficient public transport system has resulted in growth in motorization trend. It is evident by the fact that number of registered vehicles has become twice its initial value during the past decade³. Moreover, the emphasis has been made on construction of infrastructure instead of travel demand management strategies. The consequences of this approach included increase of travel delay, environmental pollution and accidents. Hence it is deemed necessary to develop a policy to cater this increase in growth with sustainable practices which has directed to the formulation of this document.

The key stakeholders of this policy belong to all public and private organizations involved in or concerned with transportation sector. These include, but not limited to, Sindh Transport department, Sindh Environmental Protection Agency (EPA), Sindh Building Control Authority (SBCA), representatives and leaders of political bodies, automotive and energy industries, land and property owners, construction, infrastructure, and transportation companies, chamber of commerce, semi-autonomous bodies / authorities such as Defence Housing Authority (DHA), City Cantonment Board (CCB), Sindh Education department, Sindh Health department, city or town municipal authorities, research and academic institutions, media and general public. Hence, it is vital to take all these stakeholders on board for acceptance and effective implementation of this policy.

2. Urban Transport Issues in Urban Areas of Sindh

A comprehensive review of research reports/articles and policy documents identified the following transport related trends/issues in urban areas of Sindh (Ali and Gazder 2010; Gazder et al., 2014; Haider and Badami 2007; Imran 2009, 2010; NTRC 1991, 2001, 2009; Qureshi et al. 2008; Russell and Anjum 1997; SMEDA 1999; Sohail 2000; TSDI 2001; Uddin and Ali 2007; Uddin et al. 2009; Uddin 2010; Uddin and Uddin 2010; URC 2001):

- Rapid urbanisation (5% per annum in Karachi and over 3% per annum in other cities).

¹ www.pbs.gov.pk

² Haris Gazdar and Hussain Bux Mallah, "The Size of Settlement and Urbanization in Sindh", http://www.researchcollective.org/Documents/The_Size_of_Settlement_and_Urbanization_in_Sindh.pdf

³ Kazmi, J. H., & Zubair, S. (2014). Estimation of vehicle damage cost involved in road traffic accidents in Karachi, Pakistan: a geospatial perspective. *Procedia engineering*, 77, 70-78.

- The increase in car ownership (over 13% per annum presently) at twice the rate as growth in population putting more pressure on the urban roads.
- Due to the exponential spatial growth of the city, the current bus system does not provide access to all the travellers adequately.
- Inadequate public transport and transit services in general and for women in particular, lack of female rider considerations in transit vehicle stocks.
- Inadequate and ill-maintained transport infrastructure, poorly designed and constructed roadways, and lack of or insufficient roadside drainage facilities for surface runoff.
- Lack of consideration of pedestrian friendly facilities in transport infrastructure design (in view of 50-60% non-motorized trips in major cities).
- Poor traffic management resulting in increased congestion, travel time, emissions, and wastage of fuel.
- Degradation of air quality in cities especially particulate matter pollution which is 6-10 times above World Health Organization (WHO) standards. This has led to increase in respiratory diseases, deteriorated public health, and increased health costs.
- Inadequate road safety measures shown by increased road crashes and fatalities (19 fatalities per 10,000 vehicles per annum or over 5000 fatalities per year) involving a relatively large proportion of pedestrians and bike/motorcycle riders.
- The reasons for most of the crashes include mismanagement of traffic, encroachment of road space and presence of large variance in size and types of vehicles on the road.
- Increasing transport energy demand (importation of crude oil increased from 45.5% in 1990-91 to 71.8% in 2003-04; transport sector accounted for an average of 48.7% of total petroleum consumption between 1990 and 2004; petroleum demand increased by an average of 4.9% annually between 1990 and 2004).
- Institutional barriers in urban and transport planning and operating agencies.

The literature review has also identified following key areas for future policies and plans.

- ***Coordination and Communication:***
 - Inadequate communication network between rural and urban areas.
 - Several key departments & authorities would play an important role in urban transport development works and require strong coordination between them.
 - All the stakeholders, including politicians, should be encouraged to increase their commitment to the improvement of transport sector. This can be achieved by highlighting the benefits, to other sectors and community as whole, through effective marketing of transport projects. Media campaigns aimed at public awareness for traffic related issues may also be helpful in this regard.
- ***Capacity Building:***
 - A need exists to build capacity for urban transport planning to be developed as a professional practice.

- A need exists to take up coordinated capacity building, research and information dissemination to raise the overall level of awareness and skills of the Sindh Transport department.
- Workshops and other forums should be organized on continual basis.
- The school management and local communities should also play their part in improving road safety.
- **Regulatory Framework:**
 - Governmental level policies for urban areas, especially Karachi, have been inconsistent. Transportation projects should be continued irrespective of the political changes in the country.
 - The Provincial Government administers several acts and rules, which have important implications in dealing with urban transport issues.
 - A need exists to guide provincial level action plans within an overall framework.
 - A need exists to regularize the public transport system in urban areas.
- **Infrastructure Development:**
 - There is a need to provide and improve transport infrastructure on modern design standards of safety and access management, especially for urban public transport services.
 - The launching of the new schemes and upcoming projects has provided a timely platform for providing significant support from the foreign investors in urban transport infrastructure. Local private sector organizations should be provided necessary framework and facilitation to play their role for the growth and improvement of transport sector in urban areas.

3. Sustainable Urban Transportation Policy for Sindh

3.1 Vision

Sindh is an important stakeholder in national development and majority of its population resides in urban areas. Urban transport policy for Sindh envisions providing equal and equitable transport to all groups of society on affordable basis with minimal impacts on environment.

3.2 Goals/Objectives

Sindh Urban transport policy document aims to cater the ever-increasing travel demand, induced by growth trends of population and urbanization, through sustainable practices. The main objectives of this policy are as follows:

- To meet the basic access and development needs of all individuals, irrespective of their status and class, in a manner consistent with human and ecosystem health, and ensure equity within and between successive generations.

- To provide a transport system that is affordable, operates fairly and efficiently, offers choice of transport mode, and supports a competitive economy, as well as balanced regional development.
- To limit emissions and waste within the planet's ability to absorb them, by using renewable resources at or below their rates of generation, and, non-renewable resources at or below the rates of development of renewable substitutes.
- Developing “public transport friendly” developments by identifying transportation nodes at town, city and regional levels to create economy of scale for government and private sector transport projects.

3.3 Guiding Principles

This policy is devised around the following basic principles of sustainable urban transport which are as follows:

- Equitable Access
- Economic Feasibility
- Environmental Sustainability
- Community Involvement and Acceptance

3.4 Expected Outcomes

The following outcomes are expected with the implementation of this policy:

- Effective management of travel demand in urban areas of Sindh resulting in reduction in travel delay, accidents and environmental degradation
- A framework to devise sustainable policies for urban areas
- An efficient and effective mechanism for collaboration among government institutions, academia, industry and other stakeholders of transport sector of Sindh
- Basis for prioritized investment in the transport sector of Sindh

The expected timeline to achieve the above objectives is 2025 provided that the policy is adopted with immediate effect. Sections 4 and 5 provide the details on the implementation and progress measurement mechanisms for this policy.

3.5 Scope

The scope of this policy document extends to transport sector planning & development including, land-use planning, master plan development, sustainable development process, energy management, low-carbon emission planning, socio-economic development and overall urban planning in urban centers of Sindh. The policy therefore focuses on urban areas with population of 1 million or above projected as of year 2014.

3.6 Exclusions

Following areas and sectors are explicitly kept out of the domain of this policy document:

- Inter-cities provincial or national highways or connecting roads. However, the connecting points between urban areas and inter-city transport, such as inter-city bus terminals, are considered for ease of access and administrative facilitation. Moreover, their integration with urban traffic has also been considered while devising guidelines for the pertinent sections of the policy.
- Inter-cities rail based transportation.
- Other non-road transportation sources including aircraft, ships, boats, etc.
- Pipelines for transportation of liquid fuels, lubricants and gases.
- Air transport between cities and sea transport.

3.7 Sustainable Urban Transport Policy

The policy has been divided in to sixteen (16) key areas, which are as follows:

3.7.1 Transport Administration

Variety of professional and administration bodies/agencies are working in Sindh with several responsibilities. Some of them are directly under administration of Sindh and some of them are local bodies' representative of each city administration. There should be a synchronization of them with clear responsibilities and their operational framework. In addition, provincial Transport department should act as a supreme body that represents a complete Transport Administration of Sindh and all local bodies and Sindh based transport agencies should report to it. Some key policy points are mentioned below:

- Strengthen Motor Vehicle Ordinance (MVO) 1965, Motor Vehicle Act (MVA) 1969 and Karachi Division (Traffic Engineering) Act 1985 to cater for recent transport regime. Apply them to all notified metropolitan areas of the province.
- Involve departments such as SBCA, National Highway & Motorway Police (NH&MP), Environment & Alternative Energy Department, Hydrocarbon Development Institute of Pakistan (HDIP), Pakistan Standard Quality Control Authority (PSQCA), Engineering Development Board (EDB), Sindh EPA, Municipal Corporations/Authorities of urban areas and other relevant departments by assigning their appropriate roles needed in transport operations, without overlapping responsibilities.
- Strengthen Building & Town Planning Regulations for sustainable and integrated land use development.
- Create Traffic Engineering Bureaus (TEBs) at divisional level to perform functions as specified in Karachi Division (Traffic Engineering) Act 1985.
- The main function of TEB would be to coordinate with communications and works department, cantonment and other developments boards/authorities, education

department, health department, city or town municipal authorities, and other relevant agencies to ensure orderly and transport friendly growth and development. Complete details about function of TEB under the aforementioned act are given in appendix A.

- Restructure traffic police on modern grounds with better recruitment process, revised organization, revised pay packages, better training and equipment for improved city traffic administration.
- Take measures for developing acceptability / application of forensic evidence in the court of Law and establishment of forensic labs.
- Develop and implement modern traffic fines system for public transport and private vehicles by incorporating traffic cameras to detect violations and online system for payment of fines.
- Develop and implement modern route permit renewal and issuance system for public transport services.
- Declare freight transport as an industry.
- Periodically update and implement the pavement and geometric design standards in coordination with experts of the field.
- Develop online system for payment of vehicle taxes and registration. The users should be able to complete the process through web-based platform, make the transaction online and receive/send the necessary documentation through e-mail (in scanned form) or courier services. Use the mechanism initiated by NADRA, for national identity card, for this purpose.

3.7.2 Travel Inventory

For a thoughtful planning, data bank of the city transport infrastructure and relevant traffic information/travel pattern of individuals along with the land use data needs to be updated periodically and stored in such a manner that it would be available to key stakeholders (especially consulting agencies). These datasets will be important to update planning and land use models, so that accurate forecasts can be made on which different planning level solutions can be devised. Some key tasks in this regard are listed below.

- Perform Household Information Survey (HIS) to collect travel inventory of the persons every 5 years.
- Establish automated permanent traffic count stations in each city, using Intelligent Transportation System (ITS).
- Conduct other transport surveys such as, Short Terms Traffic Volume Counts Surveys, Speed Surveys, Occupancy Surveys, Public Transport Frequency Surveys, Public Transport Boarding & Alighting Surveys, Screen Line Surveys, Cordon Line Surveys, Road Inventory Surveys, Socioeconomic Survey, Health Surveys, and Noise Surveys, at least with bi-annual frequency and maintain its inventory.
- Updated Travel inventory must be used in restructuring and notifying road hierarchy on periodic basis.

3.7.3 Land Use and Transport Planning

A comprehensive transport planning framework that is integrated with land use plan of the key cities in Sindh is vital to implement. Without that framework it is difficult to ascertain demand and supply balance of the transport infrastructure.

- Develop and periodically update an integrated transport – land use model for each key city of Sindh.
- Improve, strengthen and strongly implement building and town planning regulations. Especially, with respect to trip rate estimation and parking regulations requirements for various building land uses and project localities.
- Involve consultants, universities and research bodies for ascertaining localized trip rates and parking ratios for various areas and land uses.
- Improve coordination with various bodies such as Municipal Authorities, Cantonment Boards, SBCA, EPA and Transport & Mass Transit Department (Government of Sindh), for harmonized and integrated city development.
- Provide depots and termini for public transport and freight vehicles and ensure the same in all future land development schemes.
- Enforce Traffic Impact Assessment (TIA) as mandatory for all major projects in urban areas.
- Allow only grid-based or circular routed development in any new urban growth/land use for convenient transport – land use integration.

3.7.4 Transport Operations

Transport operations of the cities need to be monitored and periodic data should be collected by the concerned department to find out gaps and scope for improvement. Devise regular operational framework along with Standard Operating Procedures (SOPs) for different agencies and timely reporting of incidents, traffic jams along with their reasoning need to be furnished and analyzed. This is necessary for smooth traffic operation of the city. Below are few points that need to be done as an immediate response to address the current traffic problems.

- Establish formal inter-city and intra-city public transport system.
- Revise the role / definitions of Provincial Transport Authority (PTA)/Regional Transport Authorities (RTAs)
- Bring Traffic Police, PSQCA, EDB, EPAs, Institutions and relevant organization/Departments on board for regularization and operation of public transport system/vehicles.
- Develop and maintain a formal performance based agreement with Transporters/bus operator companies.
- Strengthen buses' fitness regime and phase out old buses (more than 15 years old) from the bus fleet.
- Bring informal public transport such as Qingqi and alike under the law. Restrict their routes to feeder routes from congested residential areas only serving formal public transport.

- Develop, implement and maintain modern public transport fare/ticketing system using online platforms.
- Plan and provide mass transit and assorted mix of modes; bus system complemented by a light rail with inter-modal competition and coordination in all urban areas.
- Conduct mass transit implementation studies for all metropolitan cities of the province for feasibility of their sustainable implementation.
- Implement recommendations of Karachi Transport Improvement Project (KTIP) 2030 with highest priority.
- Take PSQCA, EDB and HDIP on board to develop standard specifications for currently used Para transit vehicles for their safe operations in cities.
- Register QingQi Rickshaws conversion workshops and bring them under the law. Enforce these workshops to convert as per the standard specifications.
- Implement fare metering.
- Impose restrictions on installation of CNG Kit, in new cars and gradually phase out old vehicles already using the same.
- Develop and implement private vehicle fitness procedure.
- Implement timely checking of CNG cylinders and kits as per HDIP recommendations.
- Increase parking availability and fee in Central Business District (CBD) and other congested areas.
- Register non-motorized transport vehicles under defined category and prohibit their use as para-transit. Moreover, restrict their use in CBD and congested areas.
- Task PTA/RTA to implement minimum haulage rates.
- Restrict use of freight transport vehicles older than 15 years.
- Implement the mechanism for preventing overloading of freight vehicles.
- Develop and implement modern vehicle inspection and certification system for public transport and private using automated systems. Assign certified workshops to facilitate this process at district level.
- Allow freight traffic to operate on the city roads only at nighttime or low traffic flow times/areas.
- Construct access-controlled bypass roads in cities at a distance more than 10 km from the boundary of city.
- Enhance building and town planning regulations to ensure freight traffic parking facilities outside city in industrial and commercial areas.
- Implement axle load control for over loaded trucks including water tankers.
- Ban strengthening of truck springs; penalize the workshops doing the same.
- Develop specifications for transport of hazardous materials, goods & products such as gas cylinder carrying LPG, Oxygen, Hydrogen, etc. for their safe passage and transfer.

- Develop a licensing regulation committee within traffic police, in collaboration with various stakeholder departments to develop specifications and guidelines for driver licensing.
- Implement centralized driver licensing system.
- Enforce mandatory insurance for drivers and vehicles of public and private modes of transport.
- Consider developing Home department on same lines as that of NH&MP.
- Develop/improve and enforce current vehicle fitness standards under TEB.
- Enforce the mandatory acquisition of road permits for public transport vehicles.
- All major arterials of the city to be installed with traffic cameras, especially on intersections. The data from these cameras would be continuously monitored at traffic control stations under traffic police.
- Phase-in use of actuated/semi-actuated signals on intersections of major arterials on the basis of traffic data collected through cameras.
- Devise protocols for blocking of roads in case of protests or processions. These protocols include preparing alternative route plans for the travelers and its advance dissemination.

3.7.5 Mobility & Travel Demand Management

In order to keep pace with the technological development and to transfer the benefits of this development to the road users of all socio-economic cadres, it is important to accommodate various modes of transport in a multimodal system. It requires utilization of modern concepts such as mobility on demand, ride sharing, active mobility, etc. Following key points must be followed to achieve this goal.

- Strict enforcement of government legislations to declare registered vehicles which will be allowed to ply on the roads.
- All contemporary modes of transport must be studied and brought in the umbrella of regulation after given due consideration to sustainability, and operational safety.
- Develop framework in collaboration with private sector to promote ride sharing services, similar to UBER which have been successfully used in Singapore and also initiated in Lahore.
- Promote walking and cycling through integrated transportation and land use planning. Establish bus stops/routes in proximity (approximately at 10 minutes of walking/cycling distance) from high density residential settlements.
- Provide shaded areas and cycle stands at the bus stations.
- Provide cycle lanes in the residential areas and/or local roads in commercial areas.
- Encourage private sector to facilitate travel demand management for its employees through flexible working hours, online working, and ride sharing services. The encouragement can be in the form of tax rebate and enlistment of organizations for government projects.

- Develop mechanism to link taxation/change of ownership to the vehicle-miles travelled to discourage use of private vehicles.

3.7.6 Safety and Security

With the introduction of “Signal Free corridors”, the travel speeds of the vehicles have increased and this has resulted in increase of frequency and severity of accidents in the city. A complete road safety program need to be developed and executed that deals with collection and analysis of the accidents data on urban areas of Sindh, including regular awareness campaigns and driver training program. The effectiveness of these programs should be evaluated and used for improvement. Below are some points to be done in response to address this vital issue.

- Strengthen and rigorously implement existing laws related to road safety.
- Improve driver training and safety awareness.
- Improve road design to make safer roads.
- Establish training schools to train personnel engaged in driver’s training.
- Update and implement the Road Safety Act.
- Develop and maintain an accident database, at all urban centers, under TEB.
- Analyze accident black spots at all times using the accident database.
- Make Road Safety Audits mandatory for all existing and new transport infrastructure developments.
- Prohibit animals/birds and freight in public transport vehicles.
- Drivers’ training is mandatory for licensing of firms for drivers of public and freight transport vehicles.
- Bind public and freight transport organizations to hire drivers who have attended driver training programs.
- Basic courses for road safety, focusing on pedestrian behavior on the roads, to be added in the curriculum of schools. These courses will be designed with the consultation of traffic police and educationists.

3.7.7 Allocation of Road Space

Encroachment, including all road side workshops, unlicensed hawkers, street vendors, filling stations, illegal parking and all such entities creating obstructions in flow of traffic, seems to be a much bigger issue especially in CBD areas, which causes frequent traffic jams. Moreover, on-street parking is another major contributing factor to this problem among many others. The handling of this problem requires efficient allocation and management of road space. The following points are recommended to achieve this.

- Rules and regulation should be formulated/amended and implemented to address all issues related to encroachments.
- Prioritize projects related to public transport and mass transit sectors.

- Construction of expressways, flyovers or mass transit to be subjected to capacity analysis of collector arteries since they have proven to be bottlenecks in the road networks neutralizing the benefits of high-speed transportation systems.
- Implement traffic engineering measures to improve efficient use of road space.
- Prioritize sustainable investment through generation of resources from within the system and resorting to borrowing only for well-prepared schemes.
- Give priority to expansion and improvement of roads only where congestion is becoming severe.
- Fix design standard and construction norms for roads basing expansion and improvement work on projected capacity utilization and congestion ratio.
- Involve private enterprises for maintenance of road works as a part of their Corporate Social Responsibility (CSR).
- Encourage measures related to Transport Demand Management (TDM) instead of expanding road infrastructure.
- E-services are considered to be a measure for travel demand management by eliminating the need for making trips. Encourage e-service initiatives in private, corporate sector and government sectors (such as web based services, ebanking etc.).

3.7.8 Parking Facilities

With an increase in private vehicle ownership, parking is a growing problem almost in all urban areas of Sindh. This problem needs to be immediately solved. Following are some key points that need to be followed to address this issue.

- Create parking authority to devise rules and regulations for parking spaces and all related issues.
- Improve, strengthen and strongly implement SBCA building bylaws.
- Define the parking requirement/demand rates with respect to the area where the building is to be constructed.
- Reassess the parking requirements for motorcycle parking to match their growing proportion in urban traffic.
- Build parking plazas at appropriate places and prepare guidelines to ensure maximum utilization of parking plazas.
- Involve consultants, universities and research bodies to ascertain localized trip rates and parking ratios for various land uses pertinent to specific localities.
- Identify zones/regions which do not have parking for all types of land uses within the building and develop dedicated parking lots (at grade or multi storied) at those locations.
- Consider areas of high congestion and CBD as pedestrian zones. Provide parking lots around CBDs for parking. Introduce a (preferably free of cost) shuttle service between parking areas and CBD.

- The on-street parking should be discouraged; however such a step is only applicable in areas where dedicated parking lots are built.

3.7.9 Rights of Women and Underage Road Users

Gender equity is always a major concern in developing countries. Women in the society, which follow strict cultural and religious notions, need to be given their due rights. Similarly underage road users, especially students, should also be exclusively considered for transportation systems planning. Following are recommended in this aspect.

- Monthly discount rechargeable cards should be provided for the students and implemented for all available public transport vehicles including buses, mini buses, and coaches.
- Increase the allocated quota for women seat seats in public transport to 30%.
- Compel public transport drivers to fully stop during passenger boarding and alighting at the designated stops.
- Encourage use of moveable partitions to create extra spaces for women.
- Consider starting dedicated buses for women where proportion of women travelers is reasonably high.
- Declare public transport as tobacco free/*Pan* free zone.
- Introduce complete physical segregation of women travelers from driver and other travelers in all public transport buses.
- Enforce ban on overcrowding in women compartment especially seating on the engine.
- Remove extra tire/stapny or CNG Cylinders in women compartment from the public transport vehicles and audit/inspection must be conducted at defined intervals to ensure this.
- Ban all cultural/inadequate decoration from the women compartment in public transport vehicles.
- Only necessary mirrors should be allowed.

3.7.10 Rights of Pedestrian

Pedestrians are highly vulnerable class of the society in terms of their rights on road. Studies reflected that this user class is more prone to be a victim of road accidents. Further, encroachments, limited availability of footpaths has also deprived the use of walking as a mode for travel. Following points are to be adopted in this regard.

- Give pedestrian rights due consideration while designing the transport facilities.
- Develop road safety audit standards under The Traffic Engineering Act, 1985 and make it mandatory for all major roads and periodically re-visit it for further improvements.
- Consider engineering improvements in road alignment, road or lane width, shoulders, central and lane markings, junction design etc.
- Prevent encroachments on footpaths through litigation.

3.7.11 Rights of Senior Citizens and Handicapped

Seniors, disabled and handicapped citizens are not given due consideration in design of public facilities, let alone in transport sector. This class needs to be given their due rights as well. The following is recommended to improve the situation.

- Dedicate seating in public transport for senior, disabled and handicapped commuters.
- Provide subsidized public transport system for senior and handicapped citizens.
- Amend building and town planning regulations to cater for rights of senior citizens and handicapped.
- Enforce all public transport vehicles to have alighting ramps for wheel chairs.

3.7.12 Urban Transport Database

A comprehensive transport database should be prepared and stored electronically with controlled access, maintenance and updation. Care should be made to anomalies in the data so that all stakeholders can take benefit of this resource. We recommend the following in this regard.

- Build a centralized database for storing & maintaining all transport related information under TEB.
- Devise a mechanism for sharing this database with all stakeholder departments, universities, institutes, researchers and design consultants.

3.7.13 Private Sector Investments

It has been seen from the experience that project based on public-private partnership has been a successful model for developmental works especially in developing countries. We recommend the following in this regard

- Actively implement Sindh Public – Private Partnership Act, 2010 Sindh Act No: V.
- Encourage levy of dedicated taxes to be credited to an urban transport fund.
- Prioritize commercially feasible projects under private investment modes and immediately conduct their technical and financial feasibility studies.
- Reserve financial funding each year in the budget of transport and communication department to conduct commercial feasibilities of projects under private investments.

3.7.14 Human Resource and Capacity Development

Pakistan is facing the issue of human resource and capacity development in all its sectors, especially transportation, at this moment in time. Due to the brain drain, majority of skilled/qualified human resource is being lost. It is therefore, very important that this issue is addressed at every forum and policies need to be framed out considering the impact of this issue. Following points are recommended.

- Encourage transport related research programs at university levels.
- Develop a better system for society – university – transport industry – government institution liaison.
- Consider tax rebate to institutions / persons conducting research and human resource development related to transportation and urban planning issues.
- Address capacity building at both institutional and individual levels.
- Organize regular joint interactive seminars and training sessions between public, traffic police, transport academicians, transport researchers, Transport Department, and private organizations (including consultants, contractors and NGOs) who are concerned with transportation sector projects for constant review and updation on existing laws and policies.

- Select at least one institute to be as ‘Urban Transport Management Centre’ in each urban area to initiate and encourage research efforts in the area of transportation planning.
- Coordinate with education department to make traffic awareness, roles, rights and responsibilities of citizens (as road users) as part of school, college and university curriculum as mandatory supplementary education.
- Provide opportunities to students at post graduate levels to obtain support from PTA/RTA or Transport Department.
- Initiate a well-rated urban transport journal by collaboration of ‘Urban Transport Management Centre’ and Transport and Mass Transit Department and other institutes.
- Develop a web-portal to share the knowledge and information with all concerned departments and institutes.

3.7.15 Public Awareness & Communication

Periodic awareness and communications programs should be conducted & maintained. Liaison from universities and non-governmental organizations can be very productive in this scenario. Following points are recommended.

- Initiate programs to effectively utilize the print, electronic and social media to sensitize masses on traffic safety, abiding traffic rules, intelligent use of public transport, trip planning and management, vehicles maintenance and emissions control, vehicle certification, and sustainable transport for social benefits.
- Construct / revamp cycle track and pedestrian path, at least one in each urban center, as a model to promote non-motorized travel mode.
- Initiate and encourage public bicycle program, such as ‘rent a bicycle’ in specially designated areas.
- Develop literature for awareness of masses on urban transport management and role of societies and develop means for its dissemination to the target group.
- Initiate measures to inform and educate relevant stakeholders about the measures to be adopted for mitigation and adaptation of climate change impacts. It can be achieved through stakeholder consultation meetings, seminars and workshops.
- Initiate programs for awareness and education on engine specification and fuel usage, vehicle maintenance and emission monitoring.
- Refresher courses for improving road sense and observing traffic rules, followed by related tests, should be mandatory for license renewals. A similar system is adopted and found to be effective for accident mitigation and improving driving skills in USA, where it is referred to as graduated licensing system.
- Promote campaigns for sustainable transportation programs such as carpooling and cycling.

3.7.16 Environmental Sustainability

Sustainability of environment is the prime initiating factor for this policy. Currently due to lack of such programs, very adverse effects on health of common man are reported. Majority of the environmental hazards have been caused due to transportation activity, and therefore, this should be part of the transport policy as well. We recommend the following.

- Environmental Impact Assessment (EIA) should be mandatory for all transportation projects.
- Declaring private vehicle free zones, especially in peak hours, in CBD areas to reduce noise and air pollutions.
- Consider reducing Green House Gas (GHG) emissions through a multigenerational effort to reach the levels set by Intergovernmental Panel on Climate Change (IPCC) for GHG emissions.
- Develop strategy with fuel refineries and oil retail companies to take measures for improved quality diesel for operation of EURO III & IV types of vehicles on the road.
- Plan and execute projects for sustainable transport such as BRT, wherever feasible and practicable in urban areas of province.
- Evaluate the potential of these projects for carbon off-set protocols/focusing on Clean Development Mechanism (CDM).
- Plan, develop and implement strategies for ITS.
- Explore and encourage the use of renewable resources as fuel. It can be done through provision of tax rebates to the industry and research funding to the academia conducting research and innovation in transportation.

4. Implementation Mechanism

This urban transport policy is recommended for further review and adaptation by Transport Department and other concerned authorities in metropolitan cities; the Planning & Development (P&D), Communication & Works (C&W), Town Planning or Housing and Urban Development, Environmental Protection and Home Departments in Provincial Governments; and the Planning Commission, Ministry of Communication and its subsidiary National Transport Research Centre (NTRC), Ministry of Environment, and Pakistan EPA on Federal Government level.

This policy will be presented in the provincial assembly and provincial departments will be mandated to facilitate the transport department for its execution.

A 3-prong mechanism is suggested for the implementation of this policy which is shown in figure 4.1.

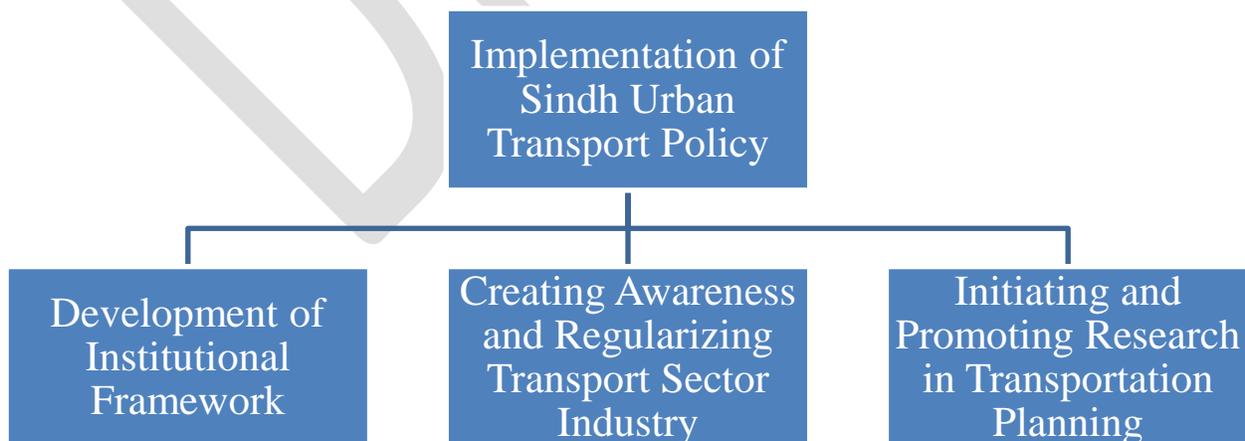


Figure 4.1: Implementation Mechanism

Institutional Framework: The above suggested suitable institutional framework should be developed and the current rules of business should be modified to incorporate the changes.

Regularizing Transport Sector Industry: Industry stakeholders from transport sector should be taken on board for the implementation of this policy. Awareness meetings, seminars and workshops should be held to increase their awareness of societal issues and concerns related to transportation sector. They should be facilitated to develop and enhance their organizational capacity in terms of human resources, and technological excellence. Mandatory courses, trainings and certifications, which are implemented in other engineering sectors of Pakistan should be implemented in transport sector as well.

Research in Transportation Planning: Exclusive funding should be provided to Urban Transport Management Centres for conducting research in transportation planning. Government should initiate the projects for development of transport sector inventory through these centres.

5. Progress Measurement

The following parameters would serve as the indicators for the effectiveness of this policy:

- Decrease in private vehicles, especially during peak hours and CBD areas
- Decrease/stability in motorization and vehicle ownership trends
- Increase in trips by walking through effective land use planning
- Decrease in road traffic accidents and their severity
- Decrease in traffic delay
- Decrease/stability in air and noise pollution
- Introduction of state-of-the-art technologies in traffic operations and vehicle manufacturing
- Increased awareness of traffic rules and regulations in pedestrians and drivers
- Travel inventory and mechanism to update and analyse it periodically
- Wilful acceptance of policy guidelines by all stakeholders of the transport sector
- Involvement of private sector in transportation infrastructure and services projects
- Equal access to public transport services for all citizens including handicapped, senior citizens and women

6. List of Stakeholder

- Sindh Transport Department;
- SBCA;
- Sindh EPA;
- Environmental Protection and Home Departments in Provincial Governments;
- Planning Commission;
- Ministry of Communication and its subsidiary National Transport Research Centre (NTRC);
- Ministry of Environment, and Pakistan-EPA on Federal Government level;
- Education department;
- Health department;
- City or town municipal authorities

- Representatives and leaders of political bodies;
- Automotive and energy industries;
- Land and property owners;
- Construction, infrastructure, and transportation companies;
- Chamber of commerce;
- Semi-autonomous bodies / authorities such as DHA, CCB;
- Research and academic institutions;
- Media;
- General public in the form of social activist groups and NGOs

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List of Abbreviations

| | |
|--------|---|
| CBD: | Central Business District |
| CCB: | City Cantonment Board |
| CNG: | Compressed Natural Gas |
| DHA: | Defence Housing Authority |
| EDB: | Engineering Development Board |
| EPA: | Environmental Protection Agency |
| GHG: | Green House Gas |
| HDIP: | Hydrocarbon Development Institute of Pakistan |
| ITS: | Intelligent Transport System |
| LPG: | Liquefied Petroleum Gas |
| NH&MP: | National Highway & Motorway Police |
| PSQCA: | Pakistan Standard Quality Control Authority |
| PTA: | Provincial Transport Authority |
| RTA: | Regional Transport Authority |
| SBCA: | Sindh Building Control Authority |
| TDM: | Travel Demand Management |
| TEB: | Traffic Engineering Bureau |

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APPENDIX A: Functions of TEB

1. The Bureau shall be headed by the Director General.
2. The general direction and administration of the Bureau and its affairs shall vest in the Director General who may perform all functions and do all acts and things which may be exercised or done by the Bureau.
3. The Director General may, for efficient performance of the functions of the Bureau in addition to a Director who shall be a whole time Officer, appoint such other Officers, staff, experts and consultants, whole time or part time, as he may consider necessary.
4. The Director, Officers, staff, experts and consultants shall possess such professional, technical, ministerial or secretarial qualifications and experience and shall be appointed on such terms and conditions as may be prescribed by rules; provided that such terms and conditions shall not be less favorable than those admissible to them immediately before the coming into force of this Act.
5. The Director, Officers, experts, consultants whole are engaged whole time and the staff of the Bureau shall be liable to such disciplinary action and in such manner as may be prescribed by rules.
6. The Bureau shall__
 - (i) ensure implementation in an expeditious and efficient manner the policy formulated or schemes approved or orders passed by the Board;
 - (ii) define, design standards, specifications and lay out plans of roads for the safe and convenient use of and efficient movement of traffic on such roads and convey the same to the concerned agency or authority for being adopted while constructing or repairing roads or bridges;
 - (iii) advise the concerned agency or authority to turn, divert or close any road or part thereof either temporary or permanently;
 - (iv) cause the boundaries of any existing road by the concerned agency or authority to be widened, altered, improved, repaired or readjusted;
 - (v) fix and convey to the concerned agency or authority the specification, alignment and point of junction for the access to a property from a road;
 - (vi) advise the concerned agency or authority to regulate the type, number and speed of vehicles using any road or part thereof by means of barriers, diversion roads, or any other means;
 - (vii) monitor and undertake regular traffic surveys on roads and provided to the concerned agency or authority such advice as may be necessary for formulating transport policy;
 - (viii) be responsible for the collection, analysis and publication of road accidents data on the basis of the monthly reports of accidents to be furnished by every police station or otherwise;

- (ix) identify the needs of the pedestrians and the facilities as may be provided for them by the concerned agency or authority (including construction of overhead bridges or underground ways) to enable them to cross the roads safely;
 - (x) verify whether bus routes are compatible with road capacity and if necessary, recommend to the Regional Transport Authority revision, planning or re-planning of routes and cancellation of route permits keeping in view the road capacity;
 - (xi) undertake the management, design, specifications, installation, control, operation, monitoring and maintenance of traffic signals;
 - (xii) identify need for bus and truck stops and terminals and make recommendations to the concerned agency or authority with regard to location and relocation of such stops and terminals;
 - (xiii) identify and convey to the concerned agency or authority areas of roads where parking or loading or unloading of vehicles shall be prohibited;
 - (xiv) define and maintain a parking policy and impose parking fee;
 - (xv) ensure in collaboration with the Karachi Building Control Authority that the building of the specified type make adequate provision for access, parking and safe and efficient vehicular movement;
 - (xvi) advise the concerned agency or authority with regard to control, execution. Size and location of advertising signs, neon-signs, hoardings, poles and posts and make recommendations to such agency or authority for removal or modification of such advertising signs, neon-signs, hoardings, poles and posts;
 - (xvii) identify requirements for road safety, arrange educational programmes, training courses and launch campaigns to promote traffic safety sense and create more awareness in public about traffic laws;
 - (xviii) require the concerned agency or authority to remove encroachment on any road or in its vicinity which is likely to become an obstruction or danger to traffic;
 - (xix) conduct research and advise various agencies on traffic and transport policy and planning;
 - (xx) make recommendations to Government with regard to improvement or reorganization of Traffic Police;
 - (xxi) take such step as may be necessary or conducive to the attainment of its objectives;
 - (xxii) perform such other functions as may be assigned to it under this Act by the Board, Committee or Director-General.
7. The Bureau shall, in discharging its functions, have power to require police assistance where necessary, and on every such requisition the police shall immediately render the required assistance.

8. The advice given or recommendations made by the Bureau in respect of any matter specified in previous sub-sections shall as far as possible be acted upon or implemented by the concerned agency or authority.
9. If any advice or recommendation of the Bureau is disputed, the concerned agency or authority may require the Bureau to re-consider the advice or recommendations and if on reconsideration, difference still persists, the matter shall be placed by the Bureau before the Committee for its orders which shall be final and binding.
10. The Bureau shall be competent to oversee and check the implementation of its advice or recommendations and in case it is satisfied that the advice or recommendation is not implemented in the specified manner or the implementation thereof is otherwise defective it may give appropriate instructions to the concerned agency or authority which shall comply with them.
11. Subject to the provisions of this Act and rules and the general control of the Director-General shall____
 - (a) exercise effective control over and responsible Director of the Bureau and his powers for smooth functioning of the day to day affairs of the Bureau;
 - (b) supervise the financial and executive administration of the Bureau and perform all duties assigned and exercise all powers conferred on or delegated to him by or under this Act;
 - (c) be responsible and have the authority necessary for overseeing the implementation by the concerned agency or authority of the orders or schemes approved by the Board or Committee or recommendations or suggestions made by the Bureau;
 - (d) have powers to exercise administrative control over the personal of the Bureau.
12. The officers, experts, consultants and the staff of the Bureau shall exercise such powers and perform such functions as may be assigned to by the Director. Powers and functions of the officers, experts, consultants and staff.

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