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Draft: Role of Connectivity in Growth Strategy of Pakistan



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Abbreviations

CAA – Civil Aviation Authority

CDA – Capital Development Authority

CIA – Central Intelligence Agency

ECC – Economic Coordination Committee

FBR – Federal Board of Revenue

GDP – Gross Domestic Product

GoP – Government of Pakistan

ICT – Information and Communication
Technology

IIN – Industrial Information Network

IMU – Infrastructure Management Unit

ISPAK – Internet Service Providers
Association of Pakistan

JFK – John F. Kennedy

KCR – Karachi Circular Railway

KDA – Karachi Development Authority

LDA – Lahore Development Authority

NADRA – National Database and
Registration Authority

NDA – New Development Approach

NHA – National Highway Authority

NLC – National Logistics Cell

NTCMU – National Trade Corridor
Management Unit

PIA – Pakistan International Airline

PKR – Pak Rupee

PPP – Public Private Partnership

PR – Pakistan Railways

PSDP – Public Sector Development Program

PTA – Pakistan Telecommunication
Authority

PTCL – Pakistan Telecommunication
Company Limited

SMEDA – Small and Medium Enterprises
Development Authority

1. Introduction

Sustainable and inclusive economic development, be it through enhanced productivity, better management of cities, integrated internal markets, inspiring youth and invigorating communities, depends on robust and adequate transport and communication infrastructure. Efficient transport and communication infrastructure reduces the cost of production through fewer transactions, timely delivery of raw materials and less wastage during transportation. It also enhances economies of scale in the production process.

Connectivity has normally been understood as railroad network, trucking, number of commercial airlines/planes, computer network, mobile phone penetration, copper wire and fiber optic cables. However in this chapter we also look at how effectively the existing infrastructure is being used. 'Useful connectivity' helps in achieving inclusive growth through efficient flow of goods, services, people and information. The term 'useful' here not only highlights the importance of the physical infrastructure with reference to economic growth but also looks at who is using it (businesses or consumers) and how well it is being used.

Useful connectivity, whether it is through transportation or telecommunications, is essential to economic growth. To compete in the global market and to better serve its growing population, Pakistan needs to improve its transportation system and telecommunication sector. For transportation, Pakistan seems to have road infrastructure in place. Pakistan has a better developed road infrastructure than India, Bangladesh, and Indonesia, but its rank in terms of railway infrastructure is far lower than India and China (table 1). Similarly a lot of effort needs to be made for improving air transportation. At the same time existing infrastructure needs to be utilized efficiently through improved management and safety.

Table 1: Quality of Infrastructure

	Road	Rail	Port	Air
Pakistan	72	55	73	81
India	90	23	83	71
China	53	27	67	79
Bangladesh	100	71	107	117
Indonesia	84	56	96	69
Malaysia	21	20	19	29
Thailand	36	57	43	28

Source: Global Competitiveness Report 2010

Almost all infrastructure projects have relied heavily on government funding with little or no investment from the private sector. It was only in the last decade that the government - withdrew from the telecom sector through deregulation and privatization. This has resulted in

considerable gains in terms of producer and consumer surpluses. Through increased private sector investment, telecom sector has not only improved connectivity of Pakistan but has also contributed rupees 109 billion to the Federal Board of Revenue (FBR) in 2009-10 (PTA, 2010). The sector's current share (measured in terms of corporate sales or revenue) in the national economy is equivalent to 2 percent of GDP.

This chapter intends to look at the overall connectivity of Pakistan and how it impacts economic growth. After reviewing the relevant literature in the following section, the discussion will proceed to a brief review of existing infrastructure. It then looks at how the current state of transport and communication infrastructure constrains economic growth through inefficiencies in markets and mismanagement of cities. After briefly touching over the issues of financing and analyzing survey results, lastly, the chapter discusses some key reforms which are considered to be of highest priority.

2. Literature Review

Improvement in transport infrastructure creates new opportunities by linking domestic and international markets and reducing travel time and travel costs. It reduces production and transactions costs in poor regions (Gannon and Liu, 1997) which serve as a stimulus for domestic commerce. Empirical research shows that poverty incidence in 'good-road provinces' and 'bad-road provinces' of Indonesia decline by 0.33 percent and 0.09 percent, respectively for every 1 percent growth in provincial GDP. Increase in roads also appears to directly improve the wages and employment level of the poor (Ali and Pernia, 2003). Another study shows that poor households in Viet Nam living in rural communities with paved roads have a 67 percent higher probability of escaping poverty than those in communities without paved roads (Glewwe, Gragnolati and Zaman, 2000). Impact of road and railways system is however larger than impact of roads alone.

Improved infrastructure has also significantly reduced poverty incidence in People's Republic of China (PRC) through agricultural productivity and nonfarm employment. The estimated elasticities with respect to road density are 0.08 for agricultural GDP per worker, 0.10 for nonagricultural employment, and 0.15 for wages of nonagricultural workers in rural areas. Amongst all the infrastructure projects, roads have played a major role in reducing poverty: for every 10,000 Yuan invested on rural roads, 3.2 poor persons are estimated to be lifted out of poverty (Fan et al., 2002). In China, it has also been found that road development increased the propensity to consume for rural farm households (Jalan and Ravallion, 2002), hence stimulating rural economy.

Caldron and Serven (2004) find that if road and rail network expands from 2.4 meters/acre to 12.1 meters/acre, growth in GDP will be higher by 1.4 percent. In addition to affecting average income growth, infrastructure development can have a relatively higher positive effect on the income and welfare of the poor. These findings support Estache (2003) that infrastructure helps poorer individuals and underdeveloped areas to get connected to core economic activities, thus allowing them to access additional productive opportunities. They also mention significant literature showing the positive impacts of infrastructure services on the health and education of the poor which further boosts their employment prospects through improved productivity.

It is not just the physical infrastructure which effects growth and income distribution but also how effectively and efficiently it is used. One quarter of the growth differential between Africa and East Asia, and 40 percent of the growth differential between low and high growth countries is due to the difference in the effective use of infrastructure resources (Hulten, 1996). Similarly, Esfahani and Ramirez (2002) also report significant growth impact of infrastructure in a large panel data set in which the contribution of infrastructure depends on institutional factors.

Mobile phones and internet have also become a major driving factor for growth and development in many countries. Studies have shown that extra 10 mobile phones per 100 people can lead to a 0.6 percentage point growth in GDP per capita (Waverman, Meschi and Fuss, 2005). Another study indicates that mobile phones were more effective in promoting growth in developing countries (an increase of 0.81 percentage points in GDP growth by introducing 10 mobiles phones per 100 population) than regular landline phones, but they were not as effective as internet access or broadband (which have an increase of 1.12 and 1.38 percentage points on GDP per capita, respectively) (Qiang, 2009).

Mobile phones provide labor flexibility and facilitate small entrepreneurs. One such example is of Quadir (a barber) in Bangladesh. Since he was unable to afford the rent for a shop, he bought a mobile phone and a motorbike and now goes to his customers' homes to cater service to them (Economist, 2009). This enabled him to serve a larger area and also charge a higher price for his services. Mobile phones have also promoted flexibility among other small entrepreneurs in Pakistan, such as taxis and mechanics. Through dissemination of information, it has made small markets more efficient. In Kerala, India, use of mobile phones made the fish markets more efficient, since fishermen could check the prices of several markets before deciding where to sell (Jensen, 2007). Through wider use of mobile phones, corruption can also be mitigated. In Pakistan, Zubair Bhatti asked clerks in Jhang district, who handled land transfers, to submit daily list of transactions, giving the amount paid and the mobile number of buyers and sellers to find out whether they had been asked to pay bribes. The guilty parties were then charged formally which deterred future corruption (Economist, 2009).

In the regression analysis of Caldron and Serven (2004), growth benefits of telecommunications are higher than those of the transport sector. In their analysis, one standard deviation increase in telecommunication increases the growth rate by 2.6 percentage points whereas the same for transport increases growth by 1.2 percentage points. A study carried out by LECG quantifies productivity gains for different levels of broadband adoption. It finds an increase in productivity of 0.1 percent for every broadband line added per 100 people in medium or high ICT countries. In countries with low level of ICT, increase in broadband penetration will create the ICT ecosystem required to realize productivity gains (LECG, 2009).

3. Connectivity of Pakistan

Together telecom and transport sector of Pakistan contribute more than 12 percent of total GDP. Telecom sector has a share of 2 percent share of GDP but contributes 6 to 7 percent in total tax revenue. Transportation sector has a much bigger GDP share of 10.5 percent. It also provides over 6 percent of employment in the country.

“Although the [transport] sector is functional, its inefficiencies with long waiting and traveling times, high costs, and low reliability are dragging the country’s economic growth. These factors also reduce the competitiveness of the country’s exports, increase the cost of doing business, and constrain Pakistan’s ability to integrate into global supply chains, which require just-in-time delivery. The poor performance of the sector is estimated to cost the economy 4-6 percent of GDP every year.” - (World Bank, 2010).

3.1 Road and Trucking

3.1.1 Road Infrastructure

The federal budget exhibits a strong bias towards financing building and maintenance of road sector. Since 1996, total road length has increased by 13 percent to 259,618 kilometers in 2010 out of which 179,290 kilometers were high type (paved). National Highways and Motorways network constitute 4.2 percent of the total road network and handle more than 85 percent of Pakistan’s total traffic.

Majority of Pakistan’s highways and motorways network is along North-South corridor with N-5 acting as the main artery and carrying 55 percent of country’s inter-city traffic. Other national highways and motorways include N-55 (Indus Highway), N-25, N-65, N-40 (RCD Highway) N-45, N-50, N-70, N-35 (Karakoram Highway), M-1 (Islamabad-Peshawar Motorway), M-2 (Islamabad-Lahore Motorway) and M-3 (Pindi Bhattian-Faisalabad Motorway). Around 60 percent of the network is in poor conditions. This is mainly due to poor maintenance, vehicle overloading,

inflated truck tires and significant shift from railways to roads in both passenger and freight transport.

Over the past few years, there has been a gradual increase in the length of high type roads and decline in low type roads (unpaved), since most low type roads are being converted to the high type. The National Highway Authority (NHA) has been carrying out extensive road development projects: 30 new projects to extend the road network by 1000 km inclusive of bridges, flyovers, and interchanges have started. The NHA has also managed to increase its toll revenue by 36 percent over the past year.

Another problem in road transportation is the corruption in the policing system. Traffic laws are lax in Pakistan and the breaking of law, underage and rash driving are common occurrences on the road. The traffic police are often corrupt and do not punish the culprits, adequately. The policemen are often underpaid and have long working hours and as such resort to accepting bribes in return for letting the law breakers go free. Corruption is also rampant in the infrastructure development side of roads. Roads are often left deliberately weak, susceptible to rapid deterioration, so that contracts can be given repeatedly to the same people.

3.1.2 Trucking Services

For transportation, Pakistan relies heavily on trucking industry which handles 96 percent of total freight traffic (GoP, 2010). Total number of registered trucks equal 216,043 while those currently on road are 196,850. Out of the total fleet, 65-70% of them comprise of single or double-axle trucks owned mainly by small operators. NLC is the largest operator with a market share of approximately 10%.

Low freight rates in the domestic market and high import tariffs on high capacity multi-axle trucks (between 30 to 60%) are a major hurdle faced by operators in improving their fleet. Low freight rates are a result of over competitive market with many small operators. Although this contributes towards lowering the cost of doing business, indirect costs associated with it in terms of road damages due to overloading, wastages of edible products during transportation and increased rate of accidents are significantly pushed upwards.

3.2 Rail Transport

Railways all over the world have an edge in long haul and mass scale transportation of both goods and passengers. In Pakistan, it was the primary mode of transport till seventies. Since then its share has declined due to the shift in government's preference towards road over rail transport. During 2005-10, budgetary expenditure on railways was only rupees 45.5 billion whereas for national highways it stood at rupees 155 billion (GoP, 2010). Today railway's share

of inland traffic has reduced from 41 percent to 10 percent for passenger and 73 percent to 4 percent for freight traffic.

Timely and safe delivery of goods to the North from the port, in the South, became a major issue after the shift in preferences of policy-makers. After the creation of National Logistic Cell (NLC) to clear the goods from Karachi port, Pakistan Railways (PR) has always found it difficult to regain its historical position. This has further pushed PR backward. Since 1990-91, total track length has decreased from 8,775 to 7,791 kilometers. Similarly total freight and passengers carried has decreased from 5,709 to 3,925 million tones and 84.9 to 58.9 millions, respectively.

However in the last decade, PR has shown some encouraging trend in both passenger and freight businesses registering an average increase of 3.2 percent and 4 percent per annum, respectively. A significant reduction in businesses during the last year has been attributed to economic slowdown and security problems. There has also been a shortage of locomotives due to non procurement of spare parts. Much of the rolling stock destroyed during December 2007 riots is still to be repaired. This delay has been mainly due to reduction in PSDP allocation and poor domestic facilities. Majority of the recently acquired engines from China are also facing maintenance issues which has lead to closure of various routes.

Table 2: Earnings of Pakistan Railways

Fiscal Year	Earnings (Rs. Million)	% Change
1998-99	9,310	--
1999-00	9,889	6.2
2000-01	11,938	20.7
2001-02	13,046	9.3
2002-03	14,812	13.5
2003-04	14,636	-1.2
2004-05	18,027	23.2
2005-06	18,184	0.9
2006-07	19,194	5.5
2007-08	19,973	4.1
2008-09	23,160	16.0
2009-10 (July- March)	16,875	-3.3

Source: Economic Survey 2009-10

Earnings are still really low and are hardly enough to cover the cost of pays and pensions which equal rupees 14 billion and 7 billion per annum, respectively. In 2008-09, earnings grew by 16 percent compared to the year before but since then they have worsened to pre-2004 levels (Table 2). Despite improved performance during the last decade, losses still remain high. In 2006-07, total loss was Rs 10 billion and in 2007-08, the loss was over Rs 12 billion.

3.3 Aviation

As of 2007-08, Pakistan has 35 airports which handled more than 14 million passengers and 318,652 million tons of cargo during the same year (Civil Aviation Authority). Jinnah International Airport, Karachi is the busiest of all but Lahore and Islamabad airports also handle significant amount of both domestic and international traffic.

Compared to 2005-06, there has been a decrease in both cargo and passenger traffic. Total passenger traffic has declined by 0.4 million passengers whereas cargo handling decreased from 347,674 to 318,652 million tons. Most of this is attributed to reduction in domestic traffic due to poor economic situation, political instability, and law & order.

However, total number of airlines with operations in Pakistan has stayed the same with the number of domestic and international airlines equaling 28. But two of the Pakistani airlines namely Aero Asia and Royal Airlines are no longer in the business. This is not only attributed to mismanagement but also to government's close cooperation with PIA, which denies competitive environment to other domestic airlines. PIA has a market share of 73 percent in passenger traffic and captures almost all the freight market in aviation sector.

On international routes, there are frequent flights to UK and Middle Eastern countries. Demand on these routes mainly comes from Pakistani labor working abroad. However linkages with other countries remain largely infrequent and time consuming. There is only one direct flight to US (JFK Airport) in a week and that also from Lahore only. Average time on a direct flight to US is 18 hrs whereas if you rely on connecting flights it normally takes more than 24 hrs. Similarly, there are only two direct flights to China (Beijing Airport), each week. Also there are only few flights to Germany, France and other western European destinations. There is considerable demand on these routes for new airlines to benefit from.

Box 1: Per Kilometer cost of Air travel from Pakistan, India and China

Just to come up with a scenario, let's assume that person A and B are leaving for London but one from Islamabad and second from Delhi, respectively. We also assume that they both are to leave on 20th of October, 2010 and are to arrive back on 27th of October, 2010.

Cheapest ticket which person A will get for 20th of October will cost 71,550 rupees (PKR). The journey time is 8 hours for a direct flight and varies between 12 to 26 hours depending on the connecting flight. However, Person B will have to pay 65,070 rupees (PKR) despite longer distance. Journey time for direct and connecting flights is approximately the same with only an hour more on a direct flight. On calculating cost per kilometer for both journeys, we get 11.36 and 9.68 PKR for person A and B, respectively. Similar calculation for a person travelling from Beijing, China gives us a cost per kilometer of 8.77 PKR.

Due to extra checks on airlines flying via Pakistan and recent slow down in aviation sector, international airlines largely stay hesitant in exploring Pakistani market. Currently there is no Pakistani airline flying to African and Latin American countries mainly due to less demand. South East Asia also stays untouched by Pakistani airlines except one or two direct flights to Malaysia. Connecting flights to these destinations are available but it takes much longer and

brings uncertainty to the journey plan. Per kilometer cost of air travel from Pakistan is also expensive (Box 1).

Domestic connectivity also faces many constraints in terms of inadequate airport handling, frequent bird hits and slow check-in procedures. This leads to lengthy flight delays which coupled with higher ticket prices relative to other modes of transport makes air travel highly inconvenient. Domestic market largely stays biased towards PIA through preferential route allocation, tax benefits and other protectionist policies, therefore making it difficult for new carriers to enter the aviation sector.

3.4 Information and Communication Technology (ICT)

Due to economic slowdown in last couple of years, service-providers in Pakistan have taken several cost cutting measures including optimization of human resources, cut in employees' perks and freezing employment. Recent floods have also damaged the existing infrastructure which has forced operators to divert their funds away from network expansion and towards repair and maintenance.

3.4.1 Mobile Telephony

Rural incomes have risen in many countries with the help of mobile service providers. With the introduction of pre-paid services, low income groups have access to cellular networks. Cell phones have accessibility in remote areas and can help provide and facilitate income-generating activities. Mobilink has introduced a Mobilink PCO system on the basis of the village phone model that can provide income to household through selling mobile phone calls. In cities, text messages are also being used as advertisements to promote small businesses that cannot afford advertisement in the mainstream media. Ideas such as these should be encouraged by Pakistan Telecom Authority (PTA) to help promote small businesses and generate economic activity in hard to reach places.

Since 2002-03 teledensity (phones per hundred individuals) has increased from 4.31 percent to 64.08 percent in 2009-10. Much of this growth has come from cellular industry which has a share of 94.2 percent in telecom teledensity followed by 3.2 percent of fixed local loop and 2.6 percent of wireless local loop. Cellular sector also has the highest share of 70 percent in telecom sector as of 2009-10. With the coming of Warid and Telenor, share of Mobilink in cellular sector has declined from 64 percent in 2003-04 to 32.2 percent in 2009-10 (Figure 1). Similarly, share of Instaphone in cellular market has reduced to zero. Ufone and Warid also experienced a drop in their total number of subscribers during 2009-10.

Fixed line penetration has remained largely poor despite the issuance of new licenses. Old copper-based infrastructure remains the major hurdle in its growth. To lay out new fiber optics

networks, too, large investments are required. Wireless local loop operators (Wateen and Witribe) have also diverted their resources towards broadband expansion.

FIGURE 1: MARKET SHARE OF CELLULAR SUBSCRIBERS (%)

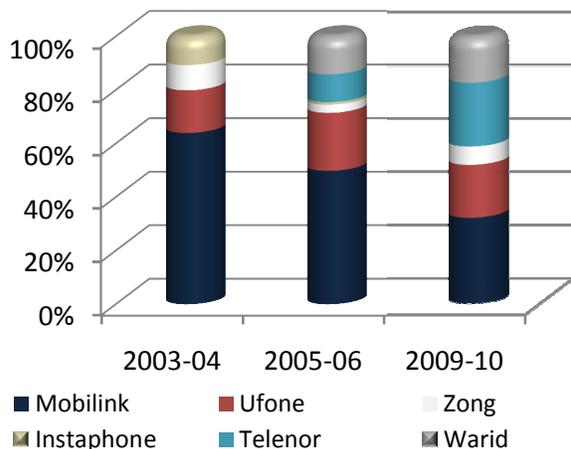
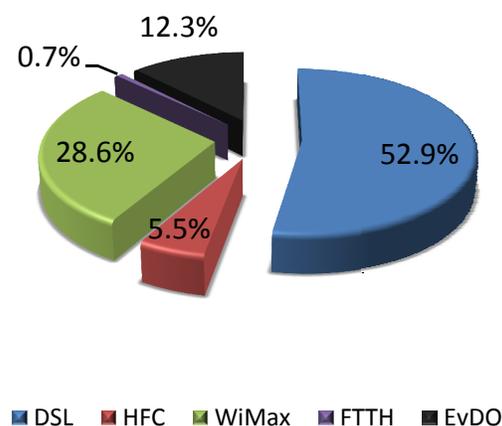


FIGURE 2: MARKET SHARE OF BROADBAND TECHNOLOGIES (%)



Source: Annual Report 2009-10, PTA

3.4.2 Internet and Broadband

Lately, internet services have also experienced significant expansion with 13 companies competing with each other for subscribers. According to estimates of ISPAK (Association of Pakistani ISPs), in 2007 there were about 3.5 million internet subscribers all across in Pakistan whereas total users crossed the 17 million mark. This number increased to 20.5 million internet users during 2009 (CIA Factbook).

Proportion of different broadband technologies in Pakistan is shown in Figure 2. DSL has historically dominated due to the existence of fixed line infrastructure. However, share of DSL has decreased from 100 percent to 52.9 percent mainly due to the successful experience of WiMax technology. It was introduced in Pakistan by Wateen telecom (pvt) Ltd in December 2007 and since then it has grown to 257,585 subscribers. Other players include Wi-tribe and PTCL. EvDO is also a wireless technology which uses radio signal for transmission. It is mainly used to provide mobile broadband services. Initially WorldCall was the sole provider but now PTCL has also stepped up by offering this service in 100 cities.

Currently broadband penetration in Pakistan remains very low at 0.5 percent (900,648 subscribers). This low level of penetration, despite considerable growth, is due to: focus on big cities; low literacy and poor computer skills; lack of local content and applications; deteriorating standard of fixed line; high cost for potential rural subscribers; reservations among parents regarding cyber security and child safety; and language barriers.

3.4.3 Connectivity Scorecard

Waverman and Dasgupta (2010) gives Pakistan a telecom connectivity score of 1.53 out of 10 in “Useful Connectivity”. This is the lowest in a group of 25 resource driven economies. In the same group, India is ranked 21st and China 17th.

Figure 3: Connectivity Scorecard

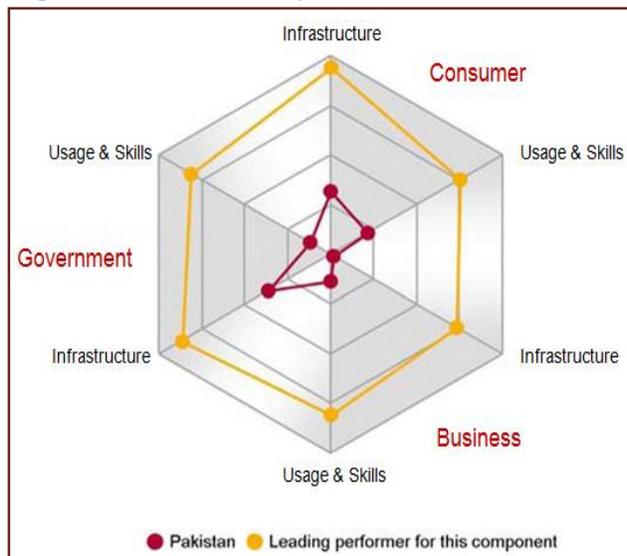


Table 3: Connectivity Scorecard

	Score	Weight
Consumer Infrastructure	0.32 (0.93)*	0.18
Consumer Usage & Skills	0.22 (0.74)*	0.18
Business Infrastructure	0.02 (0.72)*	0.31
Business Usage & Skills	0.14 (0.79)*	0.26
Government Infrastructure	0.36 (0.85)*	0.04
Government Usage & Skills	0.12 (0.80)*	0.03

* The score of the leading performer for this component

Source: www.connectivityscorecard.org (2010)

Figure 3 graphically shows the relative position of Pakistan with respect to the leading performers in each sub-sector. Table 3, while presenting similar comparison in numeric form, also shows the importance given to each sub-sector when calculating final connectivity score. Pakistan does poorly in all the sectors. However, there is relatively better score in consumer sector mainly due to increasing foreign and domestic investment in ICT. Since 2001-02, foreign direct investment in ICT has increased from 6.1 million dollars to 1.44 billion dollars in 2007-08. This has resulted in marked improvement in both Consumer Infrastructure and Usage & Skills compared to previous years.

In Government sector, although significant infrastructure is available which highlights government intention of promoting ICT in work environment, due to poor Usage & Skills, not all benefits can be realized. Business sector, which gets 57 percent of the total weight, performs very poorly in both Infrastructure and Usage & Skills. This indicates much lower business investment in ICT. This is mainly due to low broadband penetration and therefore lesser demand for e-commerce activities.

3.4.4 E-Government

Box 2: Sachivalaya Vahini or e-governance in the Secretariat in Karnataka

The Secretariat is the apex decision making body of the state and deals with a large number of departments. It involves an enormous amount of communication, keeping, maintaining and processing a large volume of data files. The manual creation, movement and maintenance of files involved enormous delays and inefficiencies. The government of Karnataka has recently set up a Secretariat Local Area Network by connecting 1000 computers in 40 state departments and 6000 secretariats. The National Informatics Centre of the state provided software support. The project has the following components:

- (a) *Patra-the Letter Monitoring System*. This is designed for the management of a large number of letters received in the secretariat by scanning these letters and moving them from desk to desk, or department to department;
- (b) *Kadatha-File Monitoring System* is the decision support system to monitor, track and decide/dispose the files without delays. Through this system, electronic files are moved from desk to desk and from department to department without waste of time;
- (c) *Mokaddame-Court Case Monitoring System* monitors the court cases in which government is the party. Cases received, petitioners/respondents details, court orders, cases put up for hearing on a particular day/type can efficiently be managed;
- (d) *Aayayaya-Budget Monitoring System* helps in making budget estimates. It also monitors budget proposals once a budget is allocated to departments;
- (e) *Sibbandi-Personal Information System* maintains information about details of employees. Within a single click, the entire history of the employee can be viewed;
- (f) *Customer Support System* provides an online system to lodge any complaints regarding hardware, network, and application software system. This system also provides online instructions for the solutions to problems.

Source: Human Development in South Asia 2008, Mahbub ul Haq Human Development Centre

Pakistan also scores poorly in e-government which can significantly incentivize usage of ICT for both businesses and consumers. UN e-government survey (2008) breaks e-government development process into five stages: Emerging; Enhanced; Interactive; Transactional; Connected. First stage involves online presence of various ministries in the form of web page showing static information. In the third stage, government delivers online services such as downloadable forms for tax payments etc. Services to enhance the convenience of citizens also start becoming evident. The final stage, which is the most sophisticated level, is characterized by:

1. *Horizontal connections (among government agencies)*
2. *Vertical connections (central and local government agencies)*
3. *Infrastructure connections (interoperability issues)*

4. Connections between governments and citizens

5. Connections among stakeholders (government, private sector, academic institutions, NGOs and civil society).

When analyzing e-government development, it will be most appropriate to put Pakistan in stage three. While some government departments are moving from stage two to stage three, others such as Federal Board of Revenue (FBR) and NADRA are progressing from stage three to stage four. It is this reason why Pakistan gets a score of 0.28 out of 1 while India and China get 0.36 and 0.47, respectively. Better use of e-government in the secretariat of Karnataka is presented in Box 2.

4. Constraints on Growth

4.1 Disintegrated Markets

More than 30 percent of agricultural output is currently wasted due to inadequate farm to market roads, lack of cold storage facilities, and obsolete and underpowered trucking fleet. Furthermore, low ICT penetration in rural areas slows down the information sharing process leading to inefficient decision-making. Only focusing on saving this agricultural produce from going waste and ensuring smooth information flow can raise the overall turnover.

Domestic markets are also not fully integrated. Operating speed of an average Pakistani truck is only half of the truck speeds in Europe. With productivity of Pakistan Railway's freight services also only 1/8th and 1/3rd of China's and India's respectively (World Bank, 2010), it not only takes longer but also costs more leading to significant price differentials in different markets. Lack of useful connectivity also increases the risk of getting into joint ventures for businessmen of different areas. This not only reduces growth in domestic commerce but also discourages innovation by forcing people to stick to their traditional ways of doing business. Similarly poor ICT adoption by businesses is hindering growth of e-commerce.

In Table 4, all the rankings except e-readiness are out of 133 countries with 133 given to the poorest performer. In the e-readiness index, 40 percent weight is give to 'business environment and consumer & business adoption' and 20 percent to 'connectivity and technology infrastructure'. Our poor performance in this index suggests we do not meet the necessary conditions for successful e-commerce.

Recently there has been some growth in e-commerce activity especially in banking sector which has taken advantage of rising teledensity and introduced mobile/online banking. Almost half of the country's 7,000 commercial bank branches are now providing e-commerce banking. Though on a smaller scale, there are also few online shopping websites and job portals (beliscity.com

and rozee.com) which will provide the base for developing the right culture for e-commerce. Major barriers are unavailability of proper infrastructure, limited internet users, security of online transactions and poor adoption within businesses.

Table 4: Why is e-commerce still at an infant stage?

Countries	E-readiness (out of 70)*	Prioritization of ICT	Staff training	Training services
Pakistan	66	74	112	99
China	56	17	50	47
India	58	19	34	32
Indonesia	65	71	33	48
Malaysia	38	14	16	26
Singapore	7	1	2	1

Source: The Global Information Technology report 2009-10

**The 2009 e-readiness rankings, Economist Intelligence Unit (2009)*

In all the other indexes, Pakistan's performance is again not encouraging, when compared to regional economies. Although there is not a huge difference in e-readiness when compared to China and India, significant gap in other rankings suggests that Pakistan will continue to lag in e-readiness at least in the near future. In China alone, there are 1100 e-commerce websites and total number of people participating in e-commerce activity now equal 142 million. E-commerce in India is also gaining momentum. India's largest e-commerce website (tradeindia.com) has 0.7 million buyers and is growing at 35% annually.

4.2 Lethargic Cities

Over the last decade, cities have increasingly faced long traffic congestions. Unorganized and infrequent public transport with no safety and quality control has forced people to resort to some sort of private transport. This sudden panic forced city planners to look for solutions in underpasses and flyovers instead of improving the management and services of public transport.

Public transport system in many Pakistani cities is not as well developed as in other global cities like London where busses on each route serve every bus stop after maximum of every ten minutes on average. In Karachi, in 2002, cars and motorcycles accounted for 92 percent of the vehicles as compared to 6 percent for paratransit vehicles and 2 percent for public transport vehicles. Furthermore, transport is dominated by the private sector in the form of minibuses and coaches, which are low capacity modes of transportation and unable to cater fully to

demand of public transport. In Karachi, 81 percent of the public transport vehicles are low capacity (Qureshi, 2007). Many people resort to dangerous measures to secure a place in buses and minibuses by hanging at the back or sitting on the roofs of vehicles. Also, there are many routes that have been specified but are not catered to by the transporters.

Table 5: Public Transport Fleet and Routes (road based) (Number)

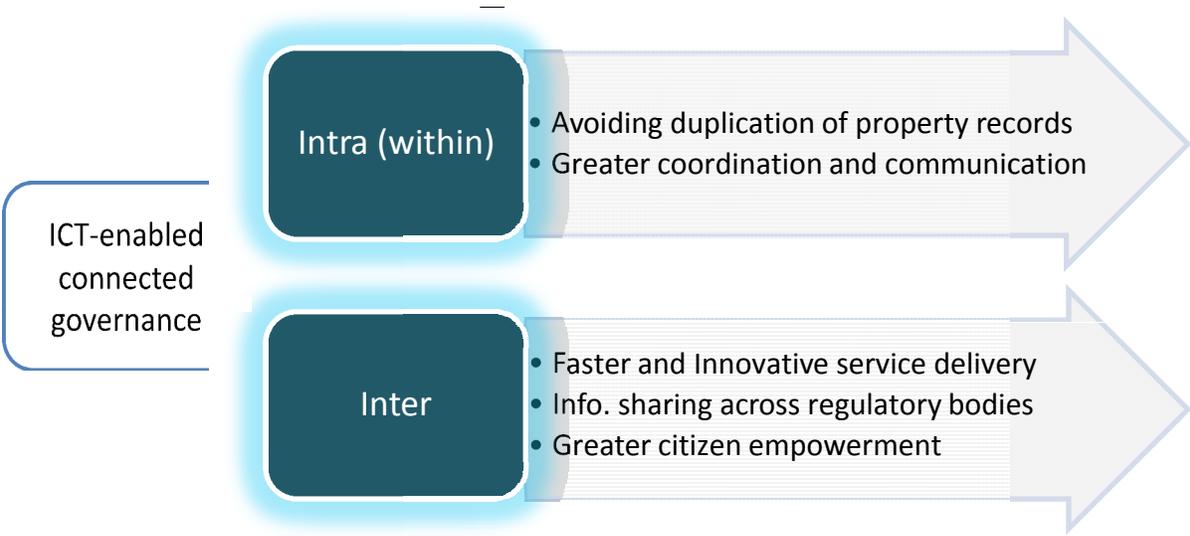
Modes	Number of on road vehicles	Routes	
		Classified	Operative
Buses	2300	110	48
Minibuses	6284	197	104
Coaches	3562	96	67
Total	12146	403	219

Source: City District Government Karachi

Rural areas in Pakistan also suffer from a lack of public transport access. Public transport in many villages is often in the form of infrequent tractor trolleys that are not conducive to transportation of people, and are often slow and expensive to operate while also causing damage to rural roads.

Regulatory bodies have also focused less on improving their internal efficiency through the adoption of ICT-enabled connected governance. Duplication of property records, lack of coordination within the regulatory bodies, lesser participation of citizens in decision making are some of the other problems being faced by the cities. Figure 4 highlights some of the benefits which could result from connected governance.

Figure 4: Benefits of Connected Governance



4.3 Poor Trade Facilitation

Together all this is effecting the business environment of the country. Pakistan ranks 85 out of 183 countries in World Bank's report on doing business. The report looks at starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and closing a business (World Bank, 2010).

Pakistan's ranking is relatively better than China and India which rank 87 and 133 respectively but still there is a lot of room for improvement. If Pakistan could decrease the total number of documents required for export and import by only 2 through ICT adoption, Pakistan's ranking will improve from the current 85 to 78. At present total documents required for export and import are 9 and 8, respectively. Document preparation takes on average 11 out of 22 days taken to export a container from Pakistan (Figure 5). Although not very significant, amongst cities it is Karachi, Hyderabad and Sukkur which take the least number of days for exporting and importing a container. It is mainly due to their close proximity to two main ports of the country.

Cost to export and import is also the least in Karachi and Hyderabad (Figure 6). It costs 57% more to import a container to Lahore than to Quetta. Inland transportation is the major source of difference in both cost and time when exporting and importing container from different cities. Trucking charges on some routes are also relatively high due to less competition. This is largely the case where rail freight services are not available or if available are of very poor quality. Dry ports are also not frequently used by traders. This is mainly due to the restriction of using bonded carriers which charge higher than the market price. Also the services offered at the dry port are not of higher quality. Pakistani traders in general are often ready to pay higher than market price if they are promised higher service quality including timely delivery of their goods. In this regard Sialkot Dry Port Trust, which was established in the private sector in 1984, can be cited as a success story. It operates under strict time management and offers custom clearance to exporters and importers at their door step. It also offers freight services with an online tracking system.

Similarly, if anyone wants to start a business in Pakistan, it will require 10 procedures which will take 20 days. In 2009-10, Rwanda stood out as a top reformer by reducing the procedures required for starting a business from 8 to 2 which helped in simplifying the start-up process from 14 to 3 days.

Figure 5: Pakistani Exporters Spend Most of Their Time on Paper Work

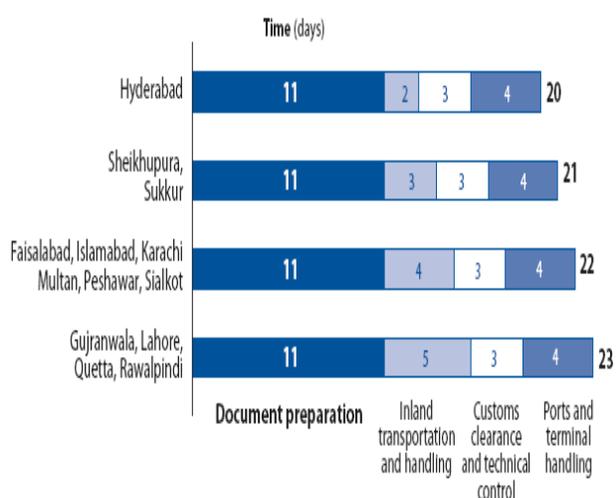
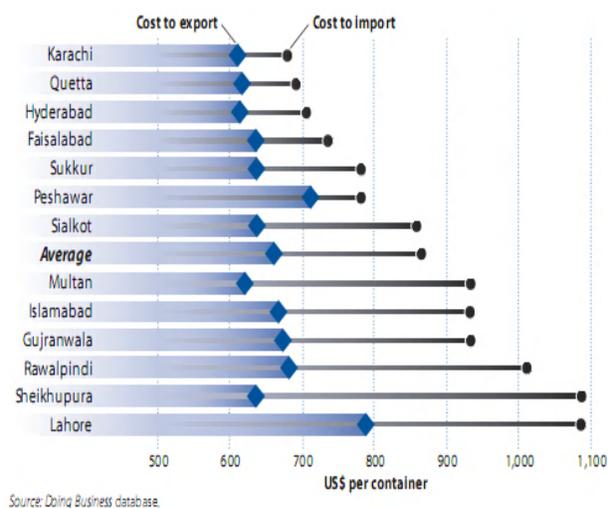


Figure 6: How Much Does it Cost to Import and Export a Container to/from Pakistan



Source: Doing Business Report, 2010

4.4 Youth with Inappropriate Skills

Low level of broadband penetration is also denying access to modern ways of networking to the youth. Job portals, which can be very useful in signaling the skills required in job market, can be of significant use in correcting the direction of future labor force. Connectivity between universities and industry is also very low in Pakistan. Pakistan is ranked 92 out of 133 countries, much lower than the ranks of China and India, which are 23 and 46, respectively (Global Information Technology report, 2010). Due to this weak university-industry nexus in Pakistan, youth is already exposed to a high risk of not acquiring appropriate skills for future jobs.

5. Financing of Infrastructure Projects

With increasing cost of construction, frequent occurrence of large scale natural disasters, and ongoing fight against insurgents, it has become impossible for the government to continue financing infrastructure projects. This can be seen from the recent reductions in the budget of Public Sector Development Projects (PSDP). Historically, PSDP has been the main source of finance in addition to foreign loans. Much of the international aid, however, was directed towards social sector projects which were arguably of temporary relief.

To deal with these challenging circumstances, IMF has highlighted some key issues which need to be looked at when undertaking any infrastructure development project. These include: What investments offer the biggest boost to growth? How much investment is needed and by whom? How to finance this investment without taking on too much debt? Without looking at these issues, there remains a much higher probability that the project will get delayed to an extent

that it no longer remains needed. If the project does get completed, long delays will push the cost to an extent that the cost benefit analysis done when the project was conceived is no longer valid. While West still figures out how to fully recover from the financial crisis of 2007, it has become difficult for the countries of developed world to finance projects in developing countries. This has left countries like Pakistan with no other option but to realize the fact and bring out policies aimed at utilizing their full strength.

In answer to the first question, National Trade Corridor Management Unit (NTCMU) was established to come up with plans aimed at improving trade related infrastructure facilities with end goal of making Pakistan regional trade hub. However, NTCMU is still to come up with any coordinated plan. Projects are still being approved in isolation with no broader vision of achieving sustainable growth. Ideally, a strategy should have been prepared by now and NTCMU should have moved on towards implementation stage.

Similarly, there is need for improving PC-I with respect to involving private sector in development projects. The entire PC-I documents, expect the project to be fully financed from the PSDP. Instead, it should be made sure that first the project is floated to the private sector for take up with full ownership and if not successful only then the government is approached for funding. Another section on 'PPP (public private partnership) Option Analysis' in the PC-I document, as suggested by the Infrastructure Management Unit (IMU), can be a good addition.

IMU (2007) has also done an extensive and useful study on constraints to private sector investment in infrastructure. But much needs to be done in removing these constraints. Some of the key constraints highlighted by the study are related to 'procurement laws' and 'procurement processes'. According to the study the current procurement laws do not include a requirement for the public body to consider infrastructure service delivery through the private sector. It also criticizes the procurement process for being too centralized. All procurement decisions for a value as low as US\$ 4-5 million are made at the highest level of the Government. This is the case even for projects which are 100% PPP and will not require any public expenditure. It further goes on to say:

“Project-to-project approval culture at the highest Government level is inefficient, leads to dis-empowerment of the public implementing bodies that undertake primary analysis to prioritise projects, and opens the door for considerations that are extraneous to the primary objective of efficient allocation amongst competing demands for limited resources. The public bodies created by statute or under notifications remain constrained by this ‘case-to-case’ approval culture.”

Despite considerable realization and wide consensus, Pakistan is still to come up with a detailed yet clear framework on PPP. This is mainly because the direction, content and the responsibility

for the PPP framework still remains unsettled. E.g. At municipal level, legal confusions between the role of local and provincial governments is undermining the PPP projects. IMU (2007) identifies restriction on local governments against financing development projects through user charges or fees as a major constraint to PPP at municipal level. Knowing that various amendments are being considered in local government law at provincial levels, these issues can be revisited with the approach of promoting private sector in infrastructure projects.

Also, land acquisition laws are currently in conflict with international norms and therefore need to be brought in line. It is one of the major issues and has often resulted in delays and sometimes even lead to the abandonment of the project due to situation taking political shape.

In addition to introducing new PPP framework, IMU study also highlights the existing laws which discourage private sector participation one of them being NHA Act which does not contain any requirement for PPP Option Analysis. NHA Act also does not empower assignment of toll receivables in favor of the private project company executing the project. Another issue is that of competition with public sector construction. It is argued by the private construction companies that lucrative projects are always given to public sector corporations in a non-transparent and discriminatory manner. Such attitude discourages growth of private sector firms and hence their ability to undertake projects which are spread thin over the time horizon.

Government of Pakistan has passed 'Pakistan Policy on Public Private Partnership' in 2010 to chart down a basic framework. However, the above mentioned issues related to the private sector participation in infrastructure development still need to be resolved.

6. Survey Analysis

A survey was conducted for this chapter to get first hand experience of citizens' problems. Out of 120 surveys distributed randomly to various universities, engineering firms and government agencies located in either Islamabad or Rawalpindi, 83% response rate was achieved. Targeting universities provided us with easy access to youth belonging to different areas of Pakistan and therefore helped us in significantly eliminating the sample bias problem.

In the sample, 52% of the respondents are from the age group of 21-25 years followed by 30% from the age group of 26 and above. Remaining 18% are between 17-20 years of age. Similarly, 38% are fully employed including 1% not in paid employment, 58% are students while 4% were both student and employed.

It was found that only 26% of the respondents use public transport on daily basis. However, there is considerable demand which is visible from 41% respondents using it at least once or

twice a week and 60% using it at least once in two weeks. On the other hand, only 21% respondents said they never use public transport.

Main problems faced while commuting are quality and lack of transport. 51% reported that they think quality is the major issue while 36% view it to be lack of transport. Of the female respondents, many reasoned security related to quality and overcrowding to be the main reason for their reluctance to travel on buses. On the contrary, only 13% reported higher prices to be their major concern. This highlights that currently insufficient routes are being served with inadequate number of buses. It, therefore, makes it necessary for the regulators to realign existing routes and ensure minimum number of buses per route.

Problems facing rail travel are also very similar but of greater magnitude. Almost all the participants complained for poor services. However, 55% thought of it as their major problem while 16% opted for long delays. It was found that 57% of the sample had never traveled via rail. Out of the university students, who represent the newer generation, only 36% had ever used railways. This is again due to poor services and long delays which 78% of all the students considered to be their immediate issues.

Air travel is considered to be the most attractive mode of travel for long distances but is the least used due to higher prices. Only 36% had ever experienced air travel and 86% find it expensive. Of the employed class, 41% do use it at least once a year but this significantly does down to 31% for students.

When asked 'how should we improve Pakistan Railways and Pakistan International Airline?', 36% preferred privatization over any other solution. 26% were in favor public-private partnership and 27% want the government to run the affairs of these enterprises on commercial basis. Most importantly, only 5% wants government to continue giving them subsidy. This is a major finding and is against the general perception of possible public anger against privatization.

Another critical issue which deserves to be highlighted is limited role of universities in career counseling. Only 20% of the students said that they received some job related information from their respective universities. Out of those working, only 3% received help from their educational institutions when looking for a job.

Internet has come to the forefront in helping students looking for jobs. 29% of the respondents find role of internet to be the most important in their job hunt. Newspapers, however, still play a lead role with their share of 31%. Remaining 26% prefer relying on their friends and family. Significant use of internet for this purpose, despite limited employment information available online, provides the labor market with a much transparent platform which is all set to be fully

exploited. Dedicated job portals along with online career counseling can play a significant role in ensuring efficient signaling.

Use of Internet has also started to become visible in the professional spheres of people's life. 62% of the respondents said that they mostly use internet for work or study purposes. This percentage is almost the same for both employed and students.

Survey results are very much in line with the expectations and lend significant support to the reforms proposed in the next section.

7. Reforms

7.1 Promoting Public-Private Partnership (PPP) in Infrastructure Development

There is need for improving PC-I with respect to involving private sector in financing infrastructure projects. It should be made sure that first the project is floated to the private sector for take up with full ownership and if not successful only then the government is approached for funding. Another section on '**PPP Option Analysis**' in the PC-I document, as suggested by the Infrastructure Management Unit (IMU), can be a good addition in this direction.

Similar analysis is required to be made part of **NHA Act** which does not contain any such requirement and therefore discourages private sector participation. NHA Act also does not empower assignment of toll receivable in favor of the private project company executing the project. Such a requirement has been very detrimental to fast track completion of infrastructure projects and has in many cases deprived Pakistan of possible foreign investment.

'Procurement laws' and **'procurement processes'** also need to be simplified and made more investment friendly. In this regard, procurement laws must require that the public body first considers infrastructure service delivery through the private sector before it steps in. Procurement processes should also be decentralized. All procurement decisions which are 100% based on PPP and do not require any sovereign guarantee should not require any approval from the highest level of the Government (Federal or Provincial).

Restriction on **local governments** against financing development projects through user charges or fees should also be reviewed by respective provinces. Furthermore, **land acquisition laws** must also be reviewed and brought in line with international best practices.

7.2 Improving Public Transport Network

Instead of seeing road construction as the only solution to traffic jams, an **efficient inter and intra city transport system** must be introduced.

Most large cities of the world use some form of rail for effective public transport. The Karachi Circular Railway (KCR) was a popular public transport system during the 1970s with about 0.3 million daily passengers (Sohail, 2000). KCR facilitated the urban poor as well as middle-income population. However, with deterioration of infrastructure, stations and the crossings led to the reduction in the number of commuters. The number of daily trips of KCR reduced from 104 in 1970s to 1 in 1999 (Qureshi, 2007). By running a train-based public transport system, commuting times can be reduced for the general population that can facilitate commerce and commercial activity, as well as increase the productivity of labor and other resources.

The Public transport system in the cities has also collapsed as the public sector (Provincial Governments) completely withdrew itself from investment, management and operation in public transport, both within and between cities after mid 1990s. Under the franchise arrangements private transport companies operated bus systems in a few major cities for some time but for lack of financing and infrastructure, such as bus terminals, bus depots, workshops etc., these systems are now reduced to about 1200 operational buses in the five major cities of Punjab. The vacuum has been filled by poor quality, generally unfit and owned by small operators, the 25 seats Mazda, 18 seats Toyota and 12 seats Suzuki.

Appropriate regulation of road based public transport is required. It would involve realignment of existing routes by bringing major avenues within cities into the public transport network; auctioning of these routes to private sector; ensuring appropriate number of buses for every route; declaring extreme left lane on major avenues as bus lane only; and time dependent insurance cover for new entrants against the hostility of existing mafia.

Case Study 3: Public Transport Model for Islamabad

Lawson's (2004) model sketches an ideal public transport scenario for a grid city. It is therefore easier to apply this model to Islamabad, which itself is a grid city. Figure 8 (a) shows a map of Islamabad with 11 possible routes in blue and red lines. Each route passes between the two sectors (G-10 and G-9) where each sector is a square of length 2 Km. According to the model, highest journey speed of 15 km/hr is attained when bus makes a stop after every 0.5 km. Journey speed is the average speed of a person between his home and desired destination. It would include time taken to reach the bus stop; waiting time at the bus stop; time taken by the bus to reach the desired bus stop; and time taken to reach the desired destination from the destination bus stop.

However, we will take this speed to be 20 km/hr. This is mainly due to higher concentration of our assumed routes on newly built avenues which have temporarily decreased traffic jams and therefore improved traffic flow.

With speed of 20 km/hr, it will take 1.5 minutes to cover 0.5 km (distance between two stops). Assuming that two buses maintain a distance of eight bus stops (2 km.) between them, maximum waiting time on each bus stop will be 12 minutes. This will require on average 5 buses per route with minimum 2 buses required on the shortest and 6 on the longest route. Total buses required on all routes within Islamabad will therefore equal 55.



Figure 7 (a)

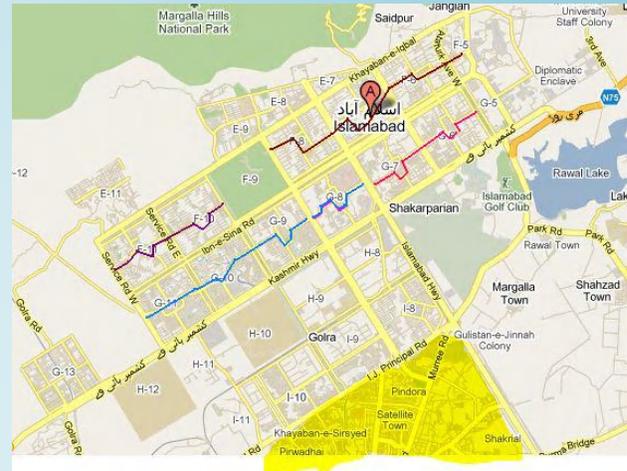


Figure 7 (b)

Such a model will allow people to get anywhere with just one transfer. Each bus stop at the intersection also allows mobility in all four directions, except for bus stops at the outer corridor. Such a network will bring time taken on bus to travel to the desired destination very close to time taken on a private car. On the longest route (I-11 to F-5) it will take maximum of 48 minutes to reach from lets say home to work.

To connect Islamabad with the suburban population, which is where most of the low income people, working in Islamabad, reside, three more routes have been shown with green lines in Figure 7 (a). Within city routes are not fixed and can always be realigned or increased depending on the demand. Figure 7 (b) shows possible alternate routes, connecting the centre point of some sectors, which could either replace routes shown in Figure 7 (a) or be added to total the number of routes.

To make this model work, Capital Development Authority (CDA) would have to auction all the routes while ensuring that no bidder acquires enough routes which discourage competition. Bidders must not be regulators or law enforcers. Also condition of minimum number of buses required on various routes must be observed. To further improve the flow of public transport, extreme left lanes on major avenues can be declared as bus lanes. Ticketing can also be introduced on the bus stops (e-ticketing) to make boarding more efficient e.g. Curitiba city in Brazil.

Government can also get into a joint venture with private sector which might help boost the confidence level. For this purpose, rules for public private partnership should be pre determined in cooperation with the market players. This will not only send a clear signal in the market but will also help in limiting exploitation at later stage.

In a situation where rail based city transport alone is seen as an expensive proposition and beyond the means of most local governments, a **mix of rail and road based network** which is integrated fully to cater to the needs of Pakistan's rapidly growing urban population has become an unavoidable necessity. For such integration of transport network, **strong regulatory institutions** – in charge of maintaining transport infrastructure and regulating private transport operators – should be established at provincial/district level.

Urban planners, apart from urban development, should also be responsible for providing **appropriate space for transport infrastructure** such as truck stands, bus terminals, bus depots, workshops etc. and transport related activities like wholesale markets and warehousing. Effort should also be focused at implementing traffic management measure such as: one way traffic; foot paths and cycle ways; improved signals; intersection improvements; bus bays; road maintenance; road drainage; removal of encroachments etc., than on road building projects.

7.3 Creating Sophisticated Market for Railways

Railways employ 90,000 people and carries on average 65 million people annually (Privatization Commission). Indian Railways on the other hand employs 1.6 million people and carries 7.3 billion people annually. This gives us an annualized passenger per employee figure of 722 for Pakistan railways and 4562 for Indian railways. With massive losses, the Pakistan railways needs to better handle its employees and operations. To constrain corruption, employees should be given **performance based remuneration**. Time delays should be cut to make the trains a feasible option for inter and intra city travel.

Pakistan Railways are facing significant losses due to mismanagement, overstaffing, under-investment, poor maintenance and weak ticketing checks allowing people to trick the system and not pay for the ticket. Over time, there have also been political interventions in deciding which new routes to open. Furthermore, railways are not allowed to charge a market clearing price, which has always been dictated by the federal government.

Prices should be deregulated and Railways Corporation should be given full power to charge market clearing price. A recent withdrawal of some amount of government subsidy on ticket prices is a step in the right direction. But to make sure that public interests are being served and exploitive prices are punished, an independent regulatory body is a must.

To improve management, **partial privatization should be encouraged**. In India, partial privatization of railways gave the railways a boost. Pakistan Railways can adopt similar partial privatization measures, e.g. outsourcing stations management, rail hospitals, allowing companies to run their own container trains, letting suburban trains run as separate companies. This will increase private sector participation necessary for promoting competition. Also when outsourcing station management, contracts should be based on total number of tickets sold,

e.g. some percentage share of the revenue from all tickets sold on a particular station would go to the management. This will incentivize the management to make sure maximum tickets are sold through better provision of services, efficient ticketing system and minimum free riding.

Gradually Pakistan Railways should be **unbundled and privatized completely**. Unbundling may include privatization of rail track, station management and services (passenger and freight) separately. **Privatization of rail track** will especially improve track utilization which currently stands at only 42%. This will also minimize government's ability to control competition by disallowing track usage to private operators. Furthermore, earnings of the track operating company will be solely dedicated to the maintenance and expansion of track infrastructure. Such unbundling will create a sophisticated market in railways sector which is necessary for efficient allocation of resources and hence growth of the sector.

Independent regulatory bodies should be established for Pakistan Railways after privatization with sole responsibility of promoting competition and implementing quality control. Improved private participation and increasing competition will result in greater benefits if independent regulatory bodies exist.

7.4 Towards Becoming a Regional Hub of Aviation

Pakistan needs to introduce competition in its aviation industry. This is essential to improve efficiency and to compete better, internationally. With world class airlines, such as Emirates and Singapore Airlines, operating in the same region, it is important for Pakistan to try and match up to their standards. Currently government's **close cooperation with PIA is the main obstacle** in ensuring competitive environment.

Pakistan's current regulatory regime is too restrictive and gives airports of regional countries a significant advantage. It must therefore create a level playing field for itself. In this regard, right to carry passengers or cargo from a second country to a third country by stopping in one's own country (6th freedom rights) should be introduced. This will make Pakistan more attractive for potential investors and facilitate current players by increasing the profitability of the sector. Singapore and several other airlines use this right extensively to fly passengers between Europe and Australasia. Given Pakistan's strategic location, this can significantly improve connectivity on Central Asia to Africa and Europe to Australasia routes. Thinking on similar lines, the design of new Islamabad airport (under construction) must envision itself as a hub catering to the Central Asian requirements.

While effort is made to become competitive at regional level, competition must also be encouraged at domestic level. To make this happen, Civil Aviation Authority (CAA) should continue pursuing 'open skies' policy in both passenger and cargo traffic. All airlines should be free to operate on routes of their choice. Routes which are congested should be auctioned

instead of giving a preferential treatment to the PIA. Similarly on international routes where ‘open skies’ or ‘multiple designations of airlines’ is not available, such routes should also be auctioned to all airlines including the national carrier in a transparent manner.

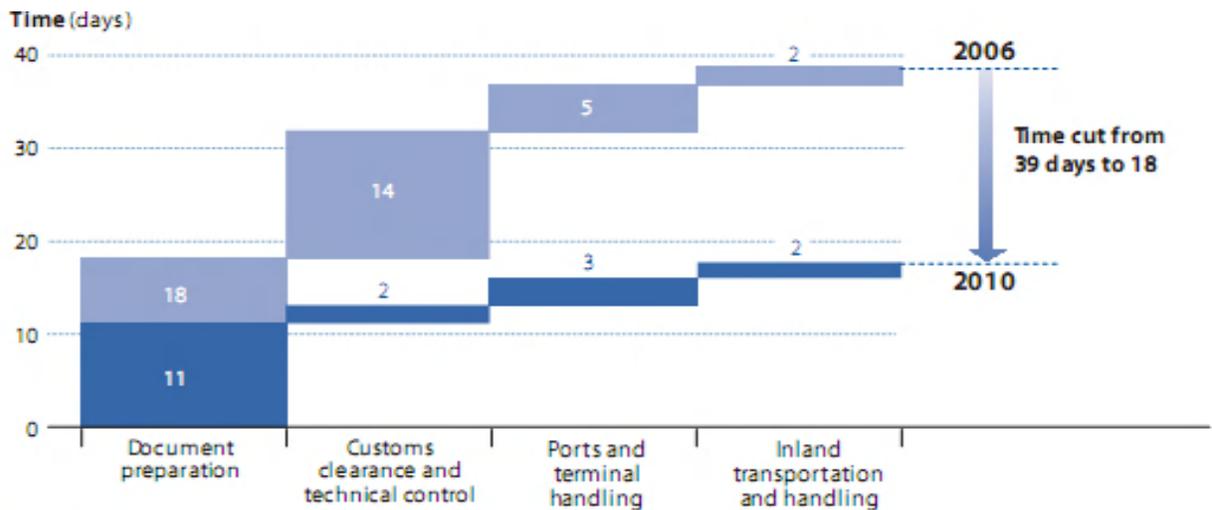
Currently, landing rights fee and timing slots allocated to private airlines by the CAA are also favored towards PIA. CAA, by the nature of its mandate, should not have control over any assets which makes it a player in the aviation industry. However, all the national airports are under its control. Therefore, to create level playing field for all market players, airports should be privatized. This will not only reduce the fees through healthy competition between airports but will also improve over all efficiency by improving check-in procedures, flight management, and provision of modern facilities.

7.5 Improving Trade Facilities through Adoption of ICT

To further facilitate trade activities, **electronic customs declaration form** should be adopted. The form is already available and Pakistan can simply consolidate other information onto the form, in line with integrated systems of France or Hong Kong (World Bank, 2010). Only doing this will significantly reduce the number of documents required for exporting/importing purposes. **Pakistan Customs Computerized System** which was piloted in Karachi (Figure 8) is still to be rolled out through out the country’s customs posts. Its successful implementation will provide a comprehensive, user-friendly and interconnected electronic data interchange system.

Sialkot Dry Port Trust model should be adopted on all the national dry ports to allow traders to clear their goods in their cities. Most of the goods are currently sent to the seaport for clearance purpose mainly due to longer clearance times, insufficient capacity and higher costs at the existing dry ports.

Figure 8: Time Needed to Import was Reduced in Karachi



Note: The reforms were implemented between April 2006 and December 2009.
Source: Doing Business database.

7.6 Incentivizing ICT Services through Provision of Local Applications

Despite significant growth rate in broadband penetration in urban areas, rural areas largely stay untouched due to insufficient demand. Government can therefore play big role in creating rural-urban demand for broadband services by incentivizing its use.

In the **e-government** evolution process, we stand at a starting middle stage where government institutions provide significant information and limited services using their websites. Recently FBR has taken some key initiative to provide options for **paying taxes online**. By **providing more services online**, government can incentivize broadband usage by reducing waiting time, travel costs and administrative hassle.

Furthermore, **Electronic Signature Act** should be passed to provide legal cover to the use of digital IDs, signature certificates and electronic authentication and verification. The proposed law should ensure that the electronic signature is: uniquely linked to the signatory; capable of identifying the signatory; created using means that the signatory can keep solely under his/her control; linked to the data to which it relates in such a manner that any subsequent change of the data is detectable. However, it must also be recognized that ensuring all this must not de-incentivize its usage thus forcing people to stick to the traditional ways. Such act will promote use of Internet and Intranet e-mail for inter-office communication, both at horizontal and vertical level, which will ultimately replace physical file system with computer based file system. Government of India passed a similar act in 2000 which addressed following issues: legal recognition of electronic documents; legal recognition of digital signatures; offences and contraventions; justice dispensation systems for cybercrimes (Information Technology Act 2000, Government of India).

To **promote right skills**, government should provide ICT infrastructure to rural schools. IT and Telecommunications Division can approach IT companies in this regard to encourage them in undertaking the responsibility of providing IT training and infrastructure in government schools on voluntary basis. Private sector can also help in establishing training institutes and internet centers in rural towns to create rural demand. Wireless technology can be used for areas which are otherwise inaccessible.

In Bangladesh, similar to Grameen Phone, **Grameenphone internet** was started to facilitate internet usage on the go and hard to reach areas. Mobile phones are an already established way to introduce internet to people without them incurring any substantial additional cost. With mobile phone, internet can be made available in rural areas which will ultimately increase income and stimulate growth. Similar to the village-phone model, a village internet model can also be introduced. Other innovative ways of using mobile phones are given in Box 3.

Box 3: Innovative ideas in using Mobile Phones

- 1) **Village phone model:** In many African rural areas, mobile phones have proved a great source of livelihood, especially among women. Women in villages buy mobile phones and sell calls around the neighborhood. The portability of the mobile phones makes this business flourish in areas where accessibility was denied before. In Bangladesh, this was promoted by the Grameen Phone, a subsidiary of the Grameen Bank and Telenor, which gives out microfinance for purchasing handsets. They gave loans to women in rural areas to buy a mobile phone to sell calls. This system has also been popularized in Afghanistan.
- 2) **Cell-bazaar:** Another innovative idea in Bangladesh is using mobile phones as markets. With the cell bazaar, people can list the items they are selling and the buyers can access these items and decide whether to buy them. This is important for many small businesses who cannot afford to advertise in the main stream media. Pakistan with its many and diverse mobile service providers can start such a service that can help small businesses as well as narrow gaps between consumers and suppliers.
- 3) **Information:** In Uganda, mobile phones have become an instrument used by farmers to get information about the weather and other factors that can affect crop yields. Farmers' Friend is a service that is accessible through text and can provide answers to questions asked by farmers. In some situations, people call back in response to specific queries. While television has been quite active in promoting farmer and general awareness, the use of cell phones can help provide awareness to remote areas. Mobile phones can be used to promote women empowerment, health and education information to enhance the social development of rural and remote areas.
- 4) **Mobile cash:** In many countries, mobile cash is thriving. Mobile money schemes allow transfer of money through cell phones. This is done by mobile phone top-ups or pre-paid vouchers as cash as compared to transferring money through people. Sometimes, this can be done through transferring airtime directly and then converting that into money through shopkeepers and retailers. G-cash and Smart Money in the Philippines, Wizzit in South Africa, Celpay in Zambia and M-PESA in Kenya are examples mobile-money schemes that are succeeding in this venture. In some countries, it has become popular enough to be used as an alternative to cash where it can be used to pay school fees and taxis.

8. Recommendations: Connectivity Action Matrix

Recommendations to ensure rapid connectivity in regards to goals to be achieved, current and proposed actions and institutional arrangements required are discussed as under:

S.No.	Goal	Current Issues	Proposed Actions	Institutional arrangement required
1.	Promoting private sector participation in Railways	Pakistan Railways ministry is self-regulating. This leads to biased policies which discourage private sector participation	Create an independent regulatory body, including in its members a private sector representative, having no financial stake in the market	Ordinance to be drafted by the Ministry of Law and promulgated by the President
2.	Creating a sophisticated market for railways	Monopoly of Pakistan Railways	Pakistan Railways should be unbundled and then privatized: <i>Rail Tracks and Signalling; Station Management; Rail services (Passenger and Freight)</i>	To be undertaken by the Ministry of Railways; Restructuring unit within the Ministry of Finance
		Federal government intervention in the form of tariff regulation	Transfer the authority of determining tariffs to service operators	Summary of tariff deregulation to be prepared by the Ministry of Railways and presented before the ECC
3.	Reducing number of documents required for exporting/importing purposes	Laborious documentation procedures	Electronic Customs Declaration Form should be adopted	To be done by Customs' department of Federal Board of Revenue
4.	Comprehensive, user-friendly and interconnected electronic data interchange system	Too many documents to be filled manually	Pakistan Customs Computerized System should be rolled out on all through out the country's customs posts	To be done by Customs' department of Federal Board of Revenue

Continued...

5.	Allowing traders to clear their goods in their cities	Long clearing times at the dry ports due to: <i>inadequate infrastructure and poor custom facilities</i>	Sialkot Dry Port trust model should be replicated on all dry ports	To be pursued by the Ministry of Commerce, Ministry of Communications and Ministry of Railways
6.	Efficient urban transport for facilitating citizens and limiting increasing burden on road infrastructure	Inadequate and non-transparent route allocations; Poor quality controls; Lack of buses; No protection/ insurance for new entrants against the hostility from existing mafia Inadequate regulatory controls	1) All routes should be realigned and auctioned in a transparent manner; 2) Minimum number of buses on each route and their quality should be observed strictly; 3) Provide bus/van insurance cover to new entrants against unexpected events e.g. attacks during protests; 4) Separate bus lane on 3 and more than 3 lane roads	Ministry of Transport (provincial level); City development authorities e.g. CDA, LDA, KDA etc.
7.	Competitive aviation sector	Close cooperation of government with PIA; Lengthy documentations; Unrealistic conditions; Biased route/slot allocations	1) Domestic and International routes should be auctioned; 2) Documentation procedure should be reduced; 3) Maximum time limit for responding to various applications; 4) Eliminate requirement of maintaining minimum financial capital before investing 5) Privatization of national airports	To be undertaken by Civil Aviation Authority

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8.	Making international routes economically feasible for national airlines	Less demand for travel to Africa, Central Asia, South East Asia	Introduce 6 th Freedom Rights. It allows airlines to carry passengers from one country to another while making a stop in its own country	To be proposed by the Civil Aviation Authority and approved by the ECC
9.	Promoting e-government to offer more online services	Poor ICT skills within government departments; No legal cover for Digital IDs;	<p>1) ICT training should be made compulsory for government employees;</p> <p>2) All departments should make their websites more active by uploading all project details;</p> <p>3) Back office of each department should be automated to bring all the information online and enhance inter departmental sharing;</p> <p>4) Electronic Signature Act should be passed to provide legal cover to the use of Digital IDs, Signature certificates and electronic authentication</p>	<p>All government departments with help from the Ministry of Information Technology;</p> <p>Act to be prepared by the Ministry of Information Technology and Pakistan Telecommunication Authority</p>

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10.	Promoting private sector investment in infrastructure development	<p>No requirement of involving private sector in following documents: PC-1; NHA Act etc.</p> <p>Restrictions of local government to finance development projects</p> <p>Improper procurement law and processes</p> <p>land acquisition laws in conflict with international norms</p>	<p>1). Introducing 'PPP Option Analysis' in PC-1 and NHA Act</p> <p>2) Reviewing restrictions on local governments in local bodies act</p> <p>3) Amending procurement laws: Making in mandatory for public body to consider infrastructure service delivery through the private sector.</p> <p>Decentralize procurement processes.</p> <p>4) Bring land acquisition laws in line with international best practices</p>	<p>Planning Commission; NHA; ECC</p> <p>Provincial Governments</p> <p>Ministry of Law; Respective bodies;</p> <p>ECC</p> <p>Ministry of Law</p>
11.	Promoting ICT skills within rural communities	<p>Poor ICT infrastructure;</p> <p>No ICT labs in most of government owned rural schools;</p> <p>Lack of awareness;</p>	<p>1) ICT infrastructure should be provided to rural schools along with skilled training staff (eg. Punjab government model);</p> <p>2) Internet centres-cum-training institutes should be established in rural town centres to facilitate people through effective use of internet and spread awareness</p>	<p>Ministry of Information Technology should encourage ICT firms to take up such projects on voluntary basis;</p> <p>Ministry of Information and Technology should also arrange appropriate space in corroboration with rural governments for interested firms</p>
12.	Flourishing and innovative telecom sector		<p>Encourage PTA for its progressive policies and facilitate its actions by removing hurdles in their implementation</p>	

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