Final Report

REG-6293: Managing the Cities in Asia
November 2012

Pre-Feasibility Study on Bus Rapid Transit Project Islamabad, Pakistan

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Abbreviations

ADB	Asian Development Bank
AFCS	Automatic Fare Collection System
ASEAN	Association of South East Asian Nations
BRT	Bus Rapid Transit
CBD	Central Business District
CCTV	Closed Circuit Television
CDA	Capital Development Authority
CDIA	Cities Development Initiative for Asia
EOI	Expression of Interest
FS	Feasibility Study
IFI	International Financing Institution
ITA	Islamabad Transport Authority
IPDF	Infrastructure Projects Development Facility
PESTLE	Political Environmental Social Technical Legal Environment
PFS	Pre Feasibility Study
PPP	Public Private Partnership
RPF	Request for Proposal
RTPI	Real Time Passenger Information
SWOT	Strengths Weaknesses Opportunity Threats
TOD	Transit Oriented Development

Disclaimer

The views expressed in this report are those of the GlobalWorks consultant team and IPDF, unless otherwise indicated. They are not necessarily the views of the Cities Development Initiative for Asia or of the Government of Pakistan.

Executive Summary

Introduction

This report summarizes the findings of a 4 month prefeasibility study which developed a 10 Year Public Transport Plan for Islamabad and a complementary BRT Project as a key component of that plan. The BRT Project, as defined herein has been developed within the context of the political, economic, technical and institutional landscape of Islamabad. For many stakeholders engaged in this PFS, it has been an initial introduction to the concept of a BRT. In this context, the BRT Project should be viewed as a work in progress where with subsequent analysis and detailed design, variations to some of the components and costs may be required prior to final investment decisions being made. However, in the context of the PFS process, the 10 Year Public Transport Plan and the BRT Project provide a sound basis and the initial step in developing a sustainable urban transport outcome for Islamabad.

Overview

The City and Development Issues: Islamabad is Pakistan's 10th most populous city with a current population estimated at 1.29 million, which is growing at 4 percent per annum. It is one if few cities in the world which has been fully planned from the outset and which continues to maintain the original urban structure. Moreover, being the nation's capital, some 47 percent of the total workforce commute daily to the range of Government offices, located in the Pak Secretariat and along the Kashmir Highway in Sector G-10 and G-11. The social profile of the urban area is generally uniform within the sectors. This means that the middle and lower income levels and the urban slums (katchi abadis) are identified and confined to discrete locations within the urban area. Lower income members of the community are most in need of public transport, and currently rely on existing services for their mobility. The BRT corridor alignments have been designed with this market in mind for this initial phase of the project.

Ten-Year Public Transport Plan: The city does not have an urban transport master plan for the forward management of the sector. Nor does it have any reliable data on travel desire lines with which to inform the development of a sustainable network. What is known is that of the 44 routes licenced to operate, only 14 were operating in 2009. This speaks volumes for the falling demand, and the future viability of the sector. Consistent complaints regarding the unsavoury treatment of passengers by transporters over the past decade have largely gone unnoticed by the authorities. Passenger surveys undertaken in this PFS have found over 90 percent of existing users are unhappy with the current system. A new impetus is required to improve the situation and to reverse this trend.

This PFS has undertaken limited traffic, household and consumer surveys to begin to understand travel demands and the mobility issues facing the urban population. From this, and in conjunction with other analysis, site observations and community engagement, a ten-year Public Transport Plan for the city has been developed as a reference framework within which a BRT network can develop. This BRT Project is the initial phase of a longer term strategy (within the Ten-Year Plan), where the BRT can be developed in to a whole-of-city network and form the backbone of a comprehensive and integrated multi operator public transport network for the urban area (including links to Rawalpindi).

BRT Project

Components: The Project includes a 26.6 km corridor with 53.2 km of segregated runningways operating adjacent to the median. It will be supported by 33 median-based stations, 4 end-of-line terminals and one depot. A fleet of 48 high floor/level boarding buses will provide a 10-minute frequency for four routes and a six minute frequency for one route during peak hours, and a 15-minute frequency at other times. Service hours will be from 6.00am to 10.00pm Monday to Saturday, and from 7.00am to 10pm on Sundays and public holidays. The BRT will be supported by an automatic fare collection system, real time passenger information at stations and CCTV system. Bus priority will be managed through a BRT Control Room, forming an integral part of the operation.

Indicative Project Costs and Revenues: Based on initial PFS project specifications, the indicative capital cost estimate (including the fleet) for the BRT Project is US$ 79.00 million. The annual operating costs (including a provision for infrastructure maintenance) is estimated to be US$ 3.78 million. Due to the complete absence of any prior travel demand data and limitations of PFS traffic counts undertaken, passenger demand is extremely difficult to estimate. Early indications however infer a demand approaching 42,000 passengers per day may be achievable. Revenues, based on a daily passenger demand of 42,000 at an average fare of Rs. 30, Rs. 40 or Rs. 50 provides an annual revenue stream of US$ 3.89 million, US$ 5.19 million or US$ 6.5 million respectively. In addition, advertising revenues may add a further 1 percent to the above revenue stream.

Financial Analysis: On the basis of the above, the estimated cost recovery varies from 102 percent, 137 percent and 170 percent, depending on the fare to be charged. This estimate, although preliminary should be viewed with considerable caution as fare box revenues of the great majority of BRT systems globally do not cover annual operating costs and is the reason why most BRT systems receive an operating subsidy from Government as part of Government's contribution to the task of providing equitable mobility for all.

From a capital investment perspective, the assessment has shown that assuming (i) Government funds all capital costs, (ii) the daily patronage is as suggested above,; then the IRR estimates for fare level scenarios of Rs 50, Rs. 40 and Rs. 30; are 14 percent, 11.6 percent and 8.6 percent respectively, and the payback period under these conditions is 15, 17 and 20 years respectively. Clearly the project requires additional patronage to make it a viable investment. This underscores the need to penetrate the estimated 400,000 per day commuter market travelling from Rawalpindi.

Economic Assessment: Irrespective of the need for public subsidy, cities continue to invest in BRT systems on the basis of the economic benefits captured. These include savings in travel time and operating costs, reduced motor vehicle accidents and lower pollution levels. Increased mobility also generates additional employment opportunities, adding to the economic activity of a city. The proportionate impacts on the poor and women is also likely to be significant due to their existing reliance on (poor, inefficient and largely unregulated) public transport. Increased BRT connectivity and travel efficiency improves the attractiveness of businesses along the alignment, raising land values, and significantly larger volumes of passengers can be moved through congested corridors compared with private vehicles. In the future, if the Islamabad BRT system is linked to Rawalpindi, it will then have a marked benefit for the many thousands of commuters relied upon by Islamabad for its economic and commercial vibrancy.

Implementing Institutions: The Capital Development Authority (CDA) will act as the implementing agency. It is currently establishing a BRT Cell within its structure to develop and implement the BRT Project. The cell is proposed to initially comprise 13 personnel in four specialist units (network development, engineering services, contract and legal, and market development). In addition to this, it is envisioned that the initial functions of the cell could be greatly enhanced through international technical assistance provided by one or several IFI's if possible. Over time, and in order to develop the additional BRT phases and other initiatives contained in the ten-year Public Transport Plan, it is envisaged that the BRT Cell will transition into an Urban Transport Wing within CDA, to assume responsibility for all relevant aspects of the urban transport sector.

Three other institutions are also involved in the urban transport sector. Firstly, the Islamabad Transport Authority (ITA) licenses vehicles and issues passenger carriage permits for bus and taxi services within Islamabad. Secondly, the Islamabad Police is responsible for traffic management and general security matters on the city's urban road network. And thirdly, the Infrastructure Project Development Facility (IPDF) has a specific mandate to assist all Government agencies to prepare projects for public private partnership (PPP) modalities, such as the BRT Project. The IPDF has also been instrumental in the PFS by completing the financial and economic analyses of the PFS.

Implementing Modalities: The CDA is keen to optimize private sector involvement through PPP modalities. The recent increase of PPP projects in Pakistan demonstrates the Government's desire to consider innovative ways of developing and financing infrastructure investments such as this. Through this PFS process, three BRT financing options have been assessed by the CDA and PFS team; (i) CDA self-financing (ii) Government grants with IFI support, and (iii) financing though PPP

modalities. Following the analysis, it is clear that the most plausible way forward is a mix of options (ii) and (iii), that is, financing through Government grants and available IFI support, with optimized private sector involvement wherever possible.

Also, there appears to be a paradigm shift away from the original CDA concept that the private sector will 'design-build-finance-operate' the entire system with little Government support, through to concepts where CDA is to retain ownership and control of the BRT system, and engage the private sector to provide and operate specific components and systems, where their involvement is advantageous to all. This includes the CDA taking a lead position in the development and implementation of the Project, funded through a blend of financing provided by the CDA, the private sector, and potentially one or several IFIs. The CDA are currently discussing these options, and the IPDF is advising on possible PPP structures and how to proceed. The IPDF welcomes additional support and guidance from IFIs in this process.

Environmental Assessment: Initial analysis indicates that the BRT Project is unlikely to result in significant impacts to receptors or the environment. The Project will also have a significant positive impact from a climate change perspective by reducing the greenhouse gas emissions within the urban area. From the estimated 16.294 million km reduction in annual kilometres travelled (mainly by low occupancy private vehicles), it is estimated at this PFS stage that this translates into approximately 4,290 tonnes of CO_2 emission savings per year.

Social Assessment: PFS surveys confirm widespread (>90 percent) public dissatisfaction with existing public transport services, and high levels of support for improved, higher quality services. Women, the elderly and disadvantaged groups in particular prioritize the issues of service reliability, seat availability and being treated with respect by drivers and conductors as key deficiencies. Two out of every three trips on public transport are daily commuter trips, the largest single market, where private sector workers account for 26 percent of the market and Government employees 20 percent. Most respondents (83 percent) pay less than Rs 100 per day for public transport, and there is widespread willingness of current users to pay for premium services, although women are more price sensitive. Over 75 percent of journeys by low-income households are by public transport, underlining their reliance on this transport mode, while less than 25 percent are by bicycle, reportedly due to safety fears.

Next Steps

Feasibility Study: A full Feasibility Study is recommended as the next phase of Project development. This will involve the preparation of detailed designs and cost estimates; relevant financial, economic, social and environmental assessments, and necessary capacity building in order for the BRT Cell to be able to develop and implement the BRT system going forward. The estimated cost of this Feasibility Study is US$802,340.

The BRT Cell must fully understand the market for travel and how to develop policies which are relevant for the city, assist the BRT maintain its relevance and ensure mobility options for all residents are maximised in accordance with modern policy and planning principles. These are the basis of any future TAs the CDA should consider seeking assistance with.

Project Implementation: Successful implementation will depend on CDA's capacity to prepare itself (during the time the Feasibility Study is being undertaken) for a number of key capabilities so that it becomes an informed agency in relation to BRT and (eventually) to the urban transport sector in general. These tasks include (i) preparation of various contract documentation, (ii) BRT planning and design manuals, (iii) the preparation of EOIs and selection of contractors,(iv) the financial management of the construction and procurement processes, (v) BRT operations and management expertise (for application in the BRT Control Room) and (vi) a vast improvement in the capacity to engage in a meaningful way, existing transporters, Government agencies, and the general community. Only when this has been achieved, can CDA claim to be in a position to successfully implement the BRT and manage the broader responsibilities required of the ten year Plan.

Such expertise will require a TA program to impart this capability. This PFS has estimated this will require a 7 month dedicated effort by CDA and the TA supporting team. Should CDIA consider this TA, the estimated cost is US$ 515,900. To move the entire process forward, CDIA, CDA and IPDF

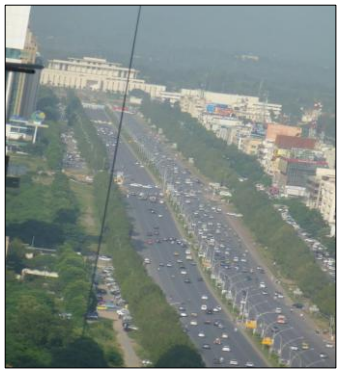
should commence serious discussions on the extent to which CDA is progressing with the activities documented in Volume 1, Chapter 12.

1 Introduction

1.1 The City Context for the Project

Islamabad, the capital city of Pakistan, is a fully planned city. Unlike virtually any other city in the world, it has a unique system of wide roads, medians and verges. Its development has been well managed and not subject to the familiar encroachment so common in many other Asian cities (Figure 1.1). From an urban planning perspective, Islamabad is an optimal city for implementation of a BRT.

Figure 1.1: BRT Project Alignment Details



Jinnah Avenue

IJP Road

Mangala Road, Sector G-9

The city, the tenth most populous in Pakistan, currently has an estimated population of 1.29 million and an estimated growth rate of 4 percent annually. As shown on Figure 1.1, it's commercial center is known as the 'Blue Area', named as such from it being annotated 'blue' on the city's original master plan. This area is considered to be the city's central business district (CBD). Comprising a 5-km long, east-west trending precinct along Jinnah Avenue, it contains many of Islamabad's corporate offices, banks, Government buildings and retail areas. Overall, the city's structure is well defined, comprising essentially a uniform land use within square shaped sectors. Each sector contains a markaz, which is a local commercial precinct and shopping area that serves surrounding residential areas.

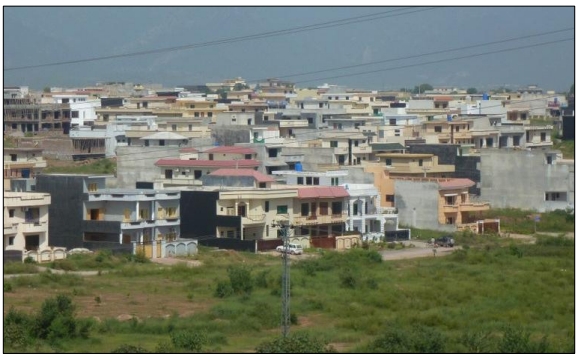


Figure 1.2: Islamabad Urban Sprawl (Sector G-14)

Figure 1.3: Government Subsidized Housing

Within each sector of the city, residential land use has generally been reserved for 'high income', 'middle income' or 'lower income' development, largely resulting in social profiling and stratification of large areas of Islamabad. Within these areas, the housing precincts generally comprise of blocks of unit developments with reasonably high densities (in the Islamabad context). Government workers, which comprise nearly 50 percent of the working population, generally live in lower to middle income

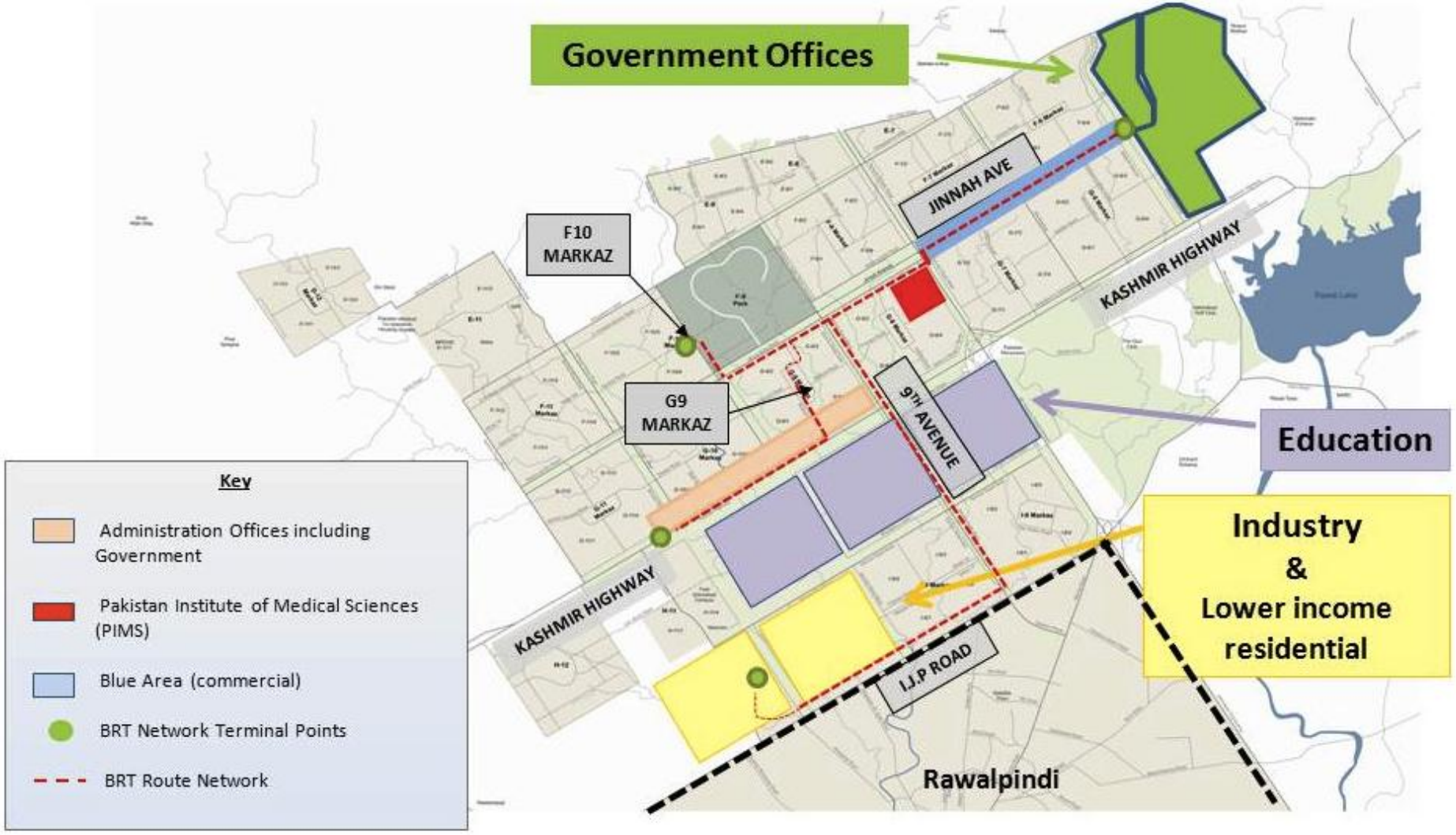


Figure 1.4: Islamabad Urban Area – Key Features (including the proposed BRT Network)

areas; primarily residing in Government subsidized housing blocks (Figure 1.3). Although primary and secondary education employment is spread across the urban area, the majority of university employment is restricted to Sectors H8 to H10, and G3. Figure 1.4 shows the key features of the city. Figure 1.5 shows the social profile stratification of the urban area.

Islamabad's urban poor are estimated to comprise about 30 percent of the city's population, primarily residing in makeshift shantytown developments known as katchi abadis. Recent assessments indicate that there are 34 katchi abadi settlements in the city[1]. The origin of these areas arose from the initial days of Islamabad's development, when the demand for labor was high. In response, government encouraged unskilled workers to migrate in from the surrounding rural areas to fill the labor gap. Formalized accommodation for these workers however was not provided, culminating in the proliferation of temporary tents and work camps. Over time, the camps became permanent and expanded rapidly. Government action was rarely taken to encourage these workers to return to their previous rural lifestyle or to relocate them to other formal residential areas within Islamabad. As a result, they remained in situ, as katchi abadis.

Today, the katchi abadis represent the poor, as most of the residents are either daily wage laborers, working as sanitary workers for Government or others, or as general domestic workers. They lack entitlement to land and mostly live under the threat of being forcefully relocated. For the most part, they also lack private motorized transport and therefore rely heavily on walking, bicycling, or existing public transport to access employment and other services offered by the city. These are likely to be key beneficiaries of a well-planned BRT system with a complementary secondary public transport network. This is a prime consideration in the development of the Ten-Year Public Transport Plan, of which the BRT Project is the first and vitally important component.

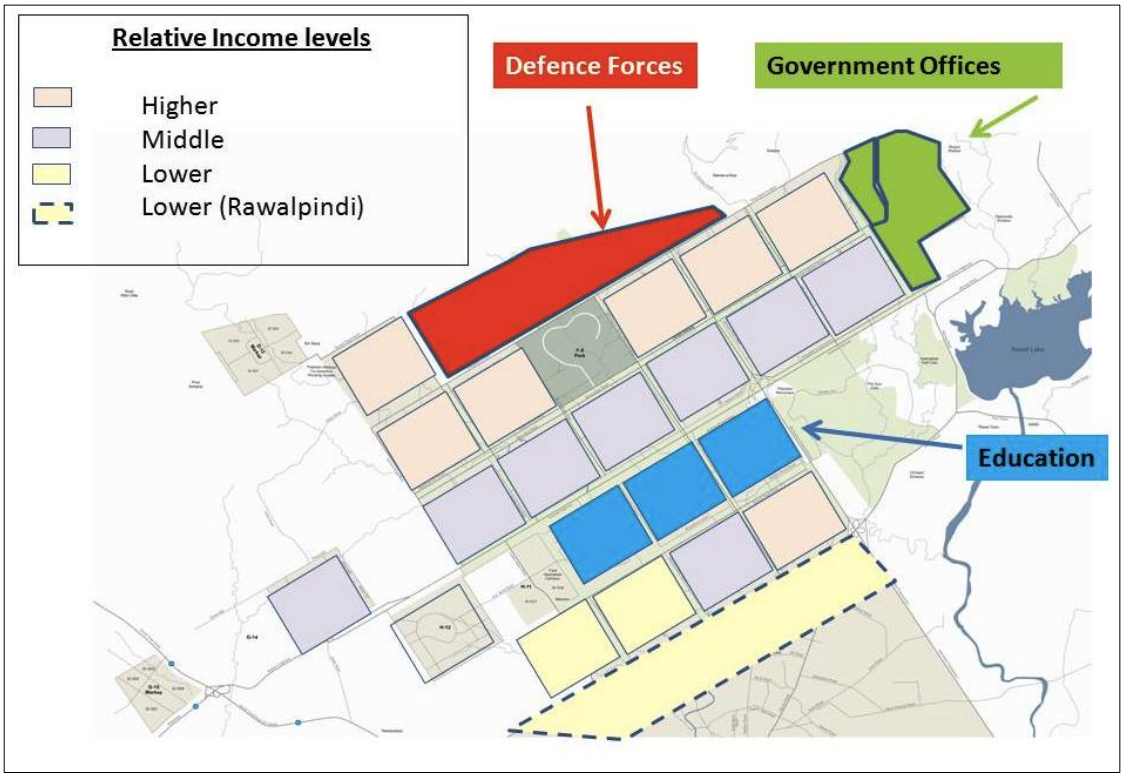


Figure 1.5: Spatial Plan Showing Areas of Income Stratification

Islamabad's urban sprawl is continuing westward (Figure 1.2), which in the absence of formalized and quality public transport systems, is creating a rapid rise in congestion levels in more established urban areas of the city. Also, nearly half of the workforce is employed by Government, which relies heavily on public transport commuting to key areas of Islamabad, including the Pak Secretariat, the

[1] From '*Shelter for the Poor: Legislation and Enforcement A Case Study of Islamabad Kachi Abadis' www.ahkrc.net.pk/assests/pdf/Housing-for-the-poor.pdf*

'Blue Area' and the Service Road East (Sector G-11). Potentially, this is therefore a ready market for a well-designed BRT system.

1.2 Existing Public Urban Transport

Despite being the nation's capital, Islamabad does not have a formal licensed urban transport system that is managed in accordance with modern urban transport practice. For the most part, the small 13-seater wagons and buses operating between nominated termini in Islamabad and the neighbouring twin city of Rawalpindi function in an essentially unmonitored environment.[2] These services contribute about 35 percent mode share of the general traffic. In addition, selected Government departments provide dedicated buses for worker commutes, the fares of which are subsidized by the Government departments. Moreover, schools and universities also have dedicated fleets for their students, further demonstrating a crucial need for enhanced and expanded public transport. Although passenger information relating to these bus services and their overall mode share contribution does not exist, it is conjectured to be over 40 percent.

There have been several initiatives over past decades to upgrade Islamabad's public transport sector, but reportedly due largely to inefficiencies and a general lack of will at higher levels, these initiatives were not successful. The one notable exception to this however was a franchised contract issued to 'Varan Tours', in order for them to operate large, modern buses on nominated routes between Rawalpindi and Islamabad. Due to subsequent events however, the existing transporters essentially forced the Varan Bus service to withdraw from service, despite a substantial level of passenger support at the time. Since then, the public transport sector has not been considered a Government priority; private vehicle ownership has grown exponentially, thereby adding the increased burden of congestion to the roads.

Due to a lack of quality public transport services, the general public suffers daily[3]. Existing services have no fixed timetables, and passengers wait times are unpredictable, a situation that is particularly disturbing for women and the elderly who have little alternative to the existing system. Passenger demand is falling and the quality of service, relative to those with private transport, is declining[4]. These are the reasons why many Government departments, schools and universities have elected to provide their workers and students with contracted bus services. The existing system is not well regarded by existing users. Local media reports during the past decade and the social survey conducted as part of the PFS confirm a widespread level of discontent with current arrangements. Respondents to the survey overwhelmingly supported the concept of a BRT system and expressed a willingness to pay a premium fare for such a premium service. This bodes well for a well-designed BRT system.

1.3 The Project Need and Opportunity

The city is growing, and beginning to suffer from increased levels of congestion. Moreover, as the demand for public transport declines as those (who can afford to do so), purchase private vehicles, those still relying on public transport face the familiar decline in standards as transporter revenues continue to decrease. In time, the consequences of this cycle will act as a barrier to equitable economic growth, and the cycle will become increasingly difficult to manage. This is a familiar story in many Asian cities, which requires a timely intervention while there remains a reasonable demand for services. Failure to act on this timely situation in Islamabad will result in a decline in such a basic public service, which is likely to reflect poorly on the nation as a whole.

With modernization and increased mobility demands, urban transport has become an essential urban service. It provides improved urban amenity by allowing more direct and efficient travel, provides equitable accessibility for all, and helps create a better urban environment by reducing congestion and pollution emission levels. It has a naturally positive business impact, as accessible locations are intrinsically valued higher by commercial interests, which in turn, can attract additional investments

2 From a licensing and service standard perspective.

3 See Volume 1, Chapter 5 for the current perceptions of existing users.

4 Of the 44 routes actually licensed in 2009, only 14 were operational at that time. This PFS has identified 23 routes operating in 2012.

and further contribute to economic growth. At a micro level, an increase in accessibility provides the opportunity for land value capture as a source of capital funding for the public infrastructure[5].

Although Islamabad has a significant proportion of Government workers (47 percent of the working population), there is still a substantial amount of economic activity in the private sector. In addition, with an estimated 30 percent of the population classed as urban poor, an affordable and accessible public transport system for all residents is essential. As noted above, there is widespread disquiet with the conditions being suffered on existing public transport services. This has been the case for the past decade and (in part) contributed to the previous establishment of the ill-fated Varan bus service. The time has therefore arrived for the development of a BRT system, utilizing a sustainable implementation and management model. The BRT Project documented in this PFS is the first stage in the longer term development of a BRT system for the twin cities to act as the backbone of a modern integrated public transport system for the greater urban area. With implementation, the project will result in a modal shift towards public transport and will be a catalyst for a long term viable business opportunity for the private sector, with an oversight and management role for Government.

2 The Project

2.2 Route Selection

It is firstly important to emphasize that, in addition to the technical assessments, the selection of the proposed BRT route network is also a result of extensive consultation with Islamabad's stakeholders, in order to reach a general consensus on the recommended routing. From a technical perspective, the unique grid pattern of the city, together with the relatively uniform land uses within each sector provides a logical basis for developing the BRT route network. As the Pakistan Secretariat at the eastern end of the city accounts for much of the commuter demand, this is regarded as the prime destination for the BRT. The Blue Area and the markaz within each sector grouping represent the bulk of the remaining trip attractions (except for education and medical trips) for the city. The BRT corridors have therefore been defined on this basis. Other key technical factors in the route selection process also include the necessity to link the high-demand/low-income areas of the I sectors (bordering Rawalpindi along IJP Road), Markaz G-9, and the numerous Government and private sector administrative offices fronting Service Road East in Sectors G-9 and G-10.

Regarding broader route selection issues, the process has been careful not to emulate previous, unsuccessful attempts in Pakistan to improve public transport services by immediately replacing existing private sector transporter services with a modern BRT system. For this reason, the development of corridors where high demand for travel forms the basis of the current transporters' livelihood, although attractive as a BRT corridor, presented too great a risk for conversion to BRT in the short term. As a result, the selected BRT corridor network has been framed to serve known corridors of demand, but which minimize as much as possible any adverse impacts on existing transporters. Over time, and with improved operating conditions, the transporters can increasingly appreciate the need for improvements as the existing transporter passengers choose to use the BRT. At that stage, and with successful engagement, transporters can become part of the new system within the umbrella of the ten-year Public Transport Plan.

The need to access the Pakistan Secretariat in Constitution Avenue was recognised at the outset. However, due to the limited capacity of CDA to guarantee access either via Aga Khan Road or through the closed section of Jinnah Avenue from Ataturk Avenue during the limited period of the PFS, this aspect has been identified as a key item for resolution during the Feasibility Study (FS).The option considered most practical is for the BRT to extend to Pak Secretariat via the closed section of Jinnah Avenue. In the medium term, and when Ataturk Avenue is widened sufficiently, an additional route could be instigated via Aga Khan Road with a station outside the Marriott Hotel. At that stage, the route to Pak Secretariat via Jinnah Avenue could then turn south on Commonwealth Avenue and service all Government agencies down to the vicinity of the Serena Hotel. Such extensions should be considered as part of the FS.

[5] As has increasingly become the case with for example, public transport investments in Hong Kong.

In addition, as momentum grows for the BRT Project during the FS, and with the support of the Prime Minister, there will be an increased willingness by CDA to meet with those Government Agencies and private sector interests (such as the Marriott Hotel) who currently provide subsidised bus transport for their workers with a view to having the BRT Project cater for these transport demands where practical.

Furthermore, given the imperative of the BRT servicing the substantial commuter workforce from Rawalpindi, the CDA needs to establish a viable proposition with the Government of Punjab to make sure the BRT penetrates this vital market segment. It is understood that arrangements are now being made to accommodate this necessary requirement as a prelude to the FS.

2.3 Project Outline

The Project consists of a BRT network of 53.2 km of median runningways along an alignment network of 26.6 km. It is supported by 33 stations, four route terminals, one bus depot, and one park-and-ride site. The network will be served by a fleet of 48 large buses operating on five routes. Four routes will operate on a 10-minute headway during peak periods, while one will operate at a 6-minute headway. Off-peak services will be on a 15-minute headway. The alignment network is shown in Figure 2.1, and the route network is shown on Figure 2.2. With the wide corridor alignments, passenger access to and from 22 BRT stations will be supported by dedicated walkover bridges of the form outlined in Figure 2.3.

The BRT will contain the features and components of a modern world-class system. It is envisioned to have a standardized and 'branded' station design with adequate capacity for current passenger demands as well as capacity for future growth. Furthermore, dedicated runningways will be physically separated from adjoining traffic lanes and subject to BRT priority signals at intersections, and at median breaks along the corridor so that BRT operations remain unhindered. Where future route frequencies or flexible operating patterns are likely to be required, staggered median platforms for a BRT fleet passing capability will be developed as part of the detailed design. Moreover, an automatic fare collection system, real time passenger information, and a modern air-conditioned and GPS equipped bus fleet will be an integral part of the system. This will be supported by a communications system and managed by a fully functioning BRT control room as part of an ongoing monitoring and management function. These components are represented in Figure 2.5.

The definition of the BRT network has been determined against a background of (i) the need to service demand, (ii) a logical solution, given the sensitivities of existing transporters (and being cognizant of the fate of the previous Varan bus service) and (iii) the current limitations of the Capital Development Authority CDA and other Government entities in developing and managing the BRT[6]. A summary of the specific design features of the BRT Project follows:

1. Where service headways or flexible service patterns are likely to incur bus bunching, the installation of staggered platforms with the necessary indented bus pull-in bays will provide for a passing lane at stations. This will be most relevant in Jinnah Avenue and (when Rawalpindi services come on line), 9th Avenue and IJP Road. The medians at the station sites should be designed during the Feasibility Study with this in mind.
2. Reinforced hard stands at the stations are to be provided to prevent pavement failure. In time, and as the bus volumes on any alignment increase with network extensions, the prospect of pavement failure between stations may need to be addressed. This is an issue to be addressed in the future.
3. Station fencing is to be provided for 100 metres either side of each platform to deter at-grade pedestrian access where an over bridge has been provided for that purpose. In addition, the issue of pedestrian/bus conflict needs to be addressed and this will reduce such incidents.
4. Median breaks that allow private vehicles to perform a U-turn (Figure 1.1) will need to be managed. Ideally, the U-turn should be removed and vehicles required to proceed to the next intersection. In cases where this is not possible, a turning slot with BRT bus controlled signals

[6] Further discussion of the logic behind the definition of the network, and the functional specifications of the various components are contained in Volume 1, Chapter 8 and Volume 2, Appendix 8.

will be required at the median break. These arrangements will be part of the detailed design during the Feasibility Study.

5. Station platforms are to be a standard 900 mm high to comply with BRT bus specifications. Where the Feasibility Study determines a substantial level of interchanging between routes (for example, the park-and-ride station at the intersection of 9th Avenue and IJP Road and the stations near the intersection of 9th Avenue and Jinnah Avenue, then additional waiting capacity should be incorporated into the design in accordance with the 'Fruin[7]' level of service standard. Care should be taken to provide for additional passenger capacity as and when the BRT network expands into Rawalpindi, and west to the developing sectors, such as G-14. This aspect of additional capacity should be addressed during the FS.
6. The runningways are to be separated from the adjacent general traffic lane by physical separators. An example of the effects of a lane separator is shown in Figure 2.4. To support this, a new regulation will be required to ensure that only authorised vehicles are to enter and operate along the runningways. This would normally include the BRT fleet, authorized maintenance vehicles and emergency vehicles while en route to an emergency.
7. The Islamabad Traffic Police will manage intersection priority under a formal working agreement such as a Memorandum of Understanding (MOU) for the management of BRT priority at intersections and bus gates. Terminals (and stations at key locations, such as Markaz G9) should be designed to provide for interchanging between existing transporters and operators. To maintain a sense of order, this function will need to be designed for compliance and supported by a manned presence. This should be addressed with detailed design in the Feasibility Study.
8. The park-and-ride facility will be a new concept for Islamabad. In this respect, it should be fully designed to ensure compliance and supported by a manned presence. Formal concessions for shops can be included but must comply with strict conditions to ensure encroachment does not become an issue. Furthermore, a passenger and general public information program will be required as part of the community awareness process.
9. It is proposed that fleet maintenance is to be provided as part of the fleet purchase contract. Over the initial 3-4 years of the contract, the vehicle manufacturer will be required to train the local mechanics employed by the BRT operator. This transfer of knowledge will be considered complete upon a third party accreditation and certification.
10. Operator, driver and conductor accreditation is to be provided by a third party in accordance with the technical requirements of the CDA as the BRT Project implementer. These technical requirements are to reflect the standards applied internationally to BRT systems elsewhere.

[7] Pedestrian Planning and Design, by JJ Fruin, 1971.

Figure 2.1: BRT Project Alignment Network

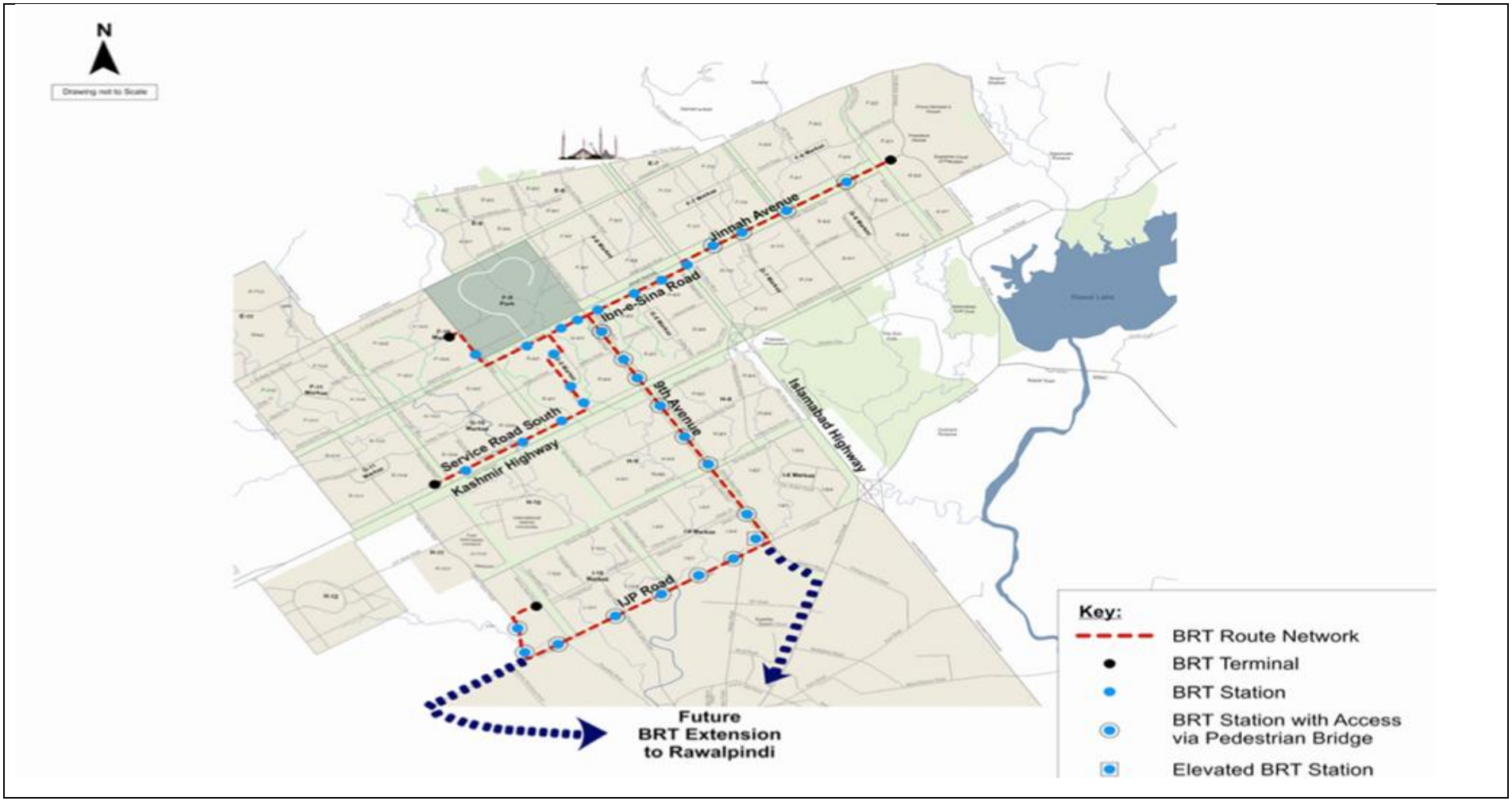
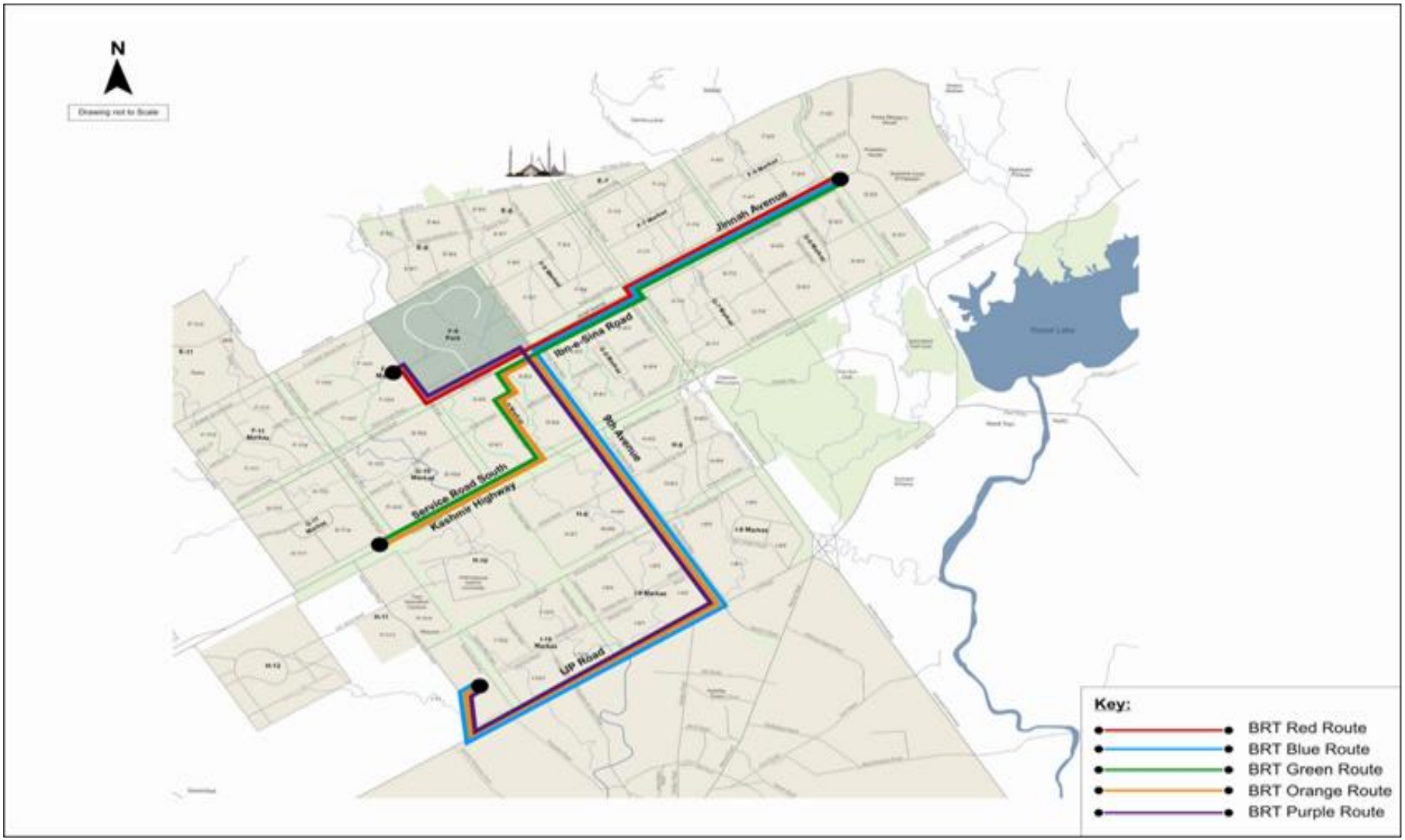
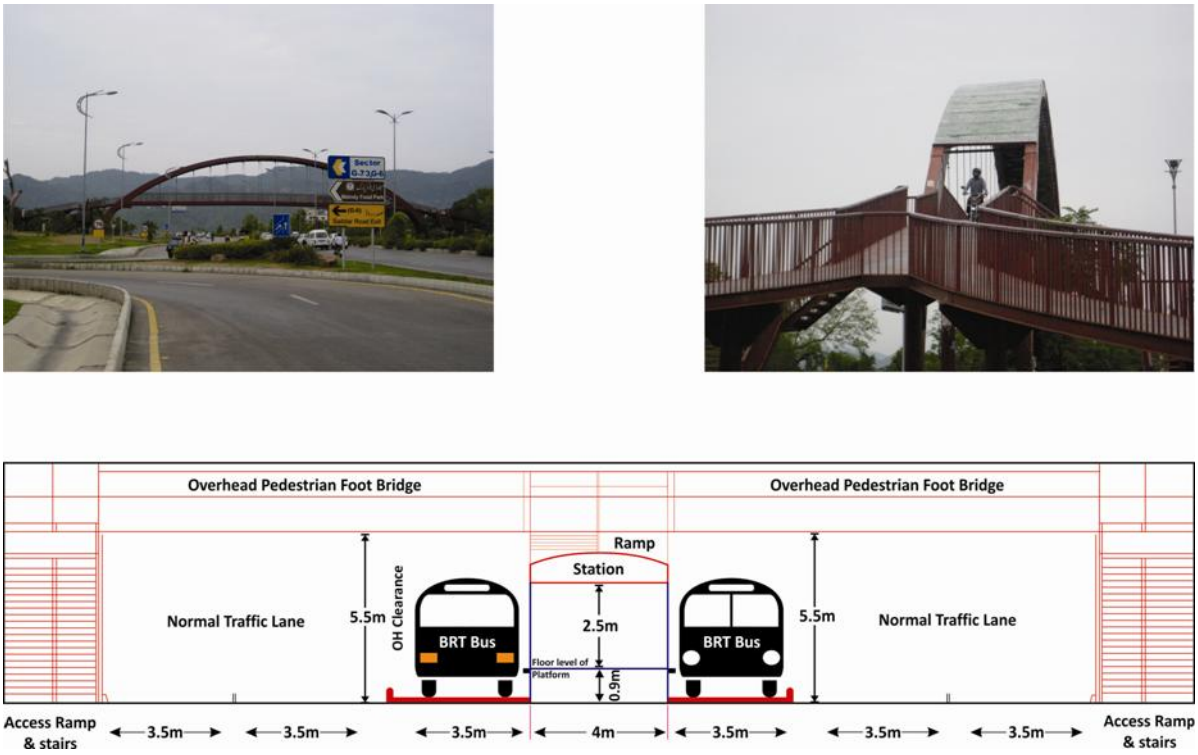


Figure 2.2: BRT Project Service Network



The BRT Project documented in this PFS represents the initial component of a broader Twin City BRT network (Islamabad and Rawalpindi), with supporting secondary and feeder networks. It has been developed having regard to (i) the known demand corridors in the city, (ii) the need to accommodate a potential future extension into the neighbouring city of Rawalpindi and urban expansion to the west, (iii) the needs of existing transporters and, (iv) Government capacity limitations to manage the sector in the short term. Furthermore, it is a project within the context of a Ten-Year Public Transport Plan prepared for the city, and is to be supported by a complementary secondary network going forward. Within the context of the Ten-Year Plan, the BRT project is therefore to act as the 'backbone of the future public transport system' of Islamabad. In time, and as the CDA capacity increases, extensions can be made to the expanding F and G sectors to the west.

Figure 2.3: Dedicated Walkover to BRT Station



2.3 The Logic of the System Specifications

In the design of most BRT systems, while there may be planning manuals in which specific system designs are preferred, there are often local conditions which, if not taken into account can place any investment in BRT at serious risk. The recent experience with the Varan Bus service in Rawalpindi-Islamabad and the earlier experience with the Swede Bus project in Karachi are cases in point[8].
For this reason, particular attention has been paid to the unique political, economic, technical and institutional landscape of Islamabad when considering the various components of the BRT project. Figure 2.4 summarizes a number of the background considerations contemplated in this process and demonstrates the impact local conditions can have when developing a workable BRT project. Given the importance of this impact, additional discussion is also contained in the sections below.

2.3.1 Alignment and Median Stations

Median alignments were chosen because of the need to separate bus lanes from general traffic. With the presence of wide medians and the difficulty police have in managing poor lane compliance, it was considered too difficult to manage a future BRT lane and kerbside stations at/near a number of intersections where existing kerbside lanes are often cluttered with taxis and vans waiting for passengers. The potential for BRT disruption as a result of civil disobedience mandated a median lane.

[8] For details of these experiences please refer to Volume 1, Chapter 4, and Volume 2, Appendix 4.

Figure 2.4: Comparative Assessment of a Range of BRT Project Component Options

ALIGNMENT CHARACTERISTICS – KERBSIDE OR MEDIAN		
Options considered relevant	***Options assessment***	***Selected option and key determinants***
Kerbside bus lane	Existing transporters and taxi drivers often congregate at key locations in the kerb lanes waiting for passengers at intermittent times and during peak periods. The absence of any prior experience by Government in addressing this issue (assuming a kerbside BRT design were to be considered) would require relocation of these intermittent waiting areas. In addition, the added concern regarding poor driving habits and potential conflicts with turning general traffic at intersections together with the limited capacity for regulatory control suggests a generally unsafe environment at these locations. In summary, at this stage of the project identification process, it is considered that Government cannot guarantee an unhindered kerb lane operation. The same sentiments as for the kerbside segregated option (below) also apply here.	The median segregated alignment with island stations is preferred because of: (i) the physical environment allows this with minimal disruption to surrounding infrastructure, (ii) this separates the future BRT operation from existing transporters and (potentially) any unrest created should be easier to manage by Government, (iii) this minimises potential lane interference at intersections with left hand turning traffic. (iv) the impact on the market is potentially maximised for the minimal cost (compared with the other options) (v) the median based island stations reduces the inconvenience of interchanging between routes and helps lessen the disadvantage compared to a full-flex system. None of the other options are able to do this as effectively.
Kerbside segregated	Existing transporters rely on kerbside access for their business. History has demonstrated the violence and destruction (by transporters and their support base) of the new bus fleet if existing transporters are faced with direct competition (ie same lane, same pick up and set down locations). Moreover, the Pakistan Government has shown it's incapacity to prevent these incidents. To repeat this approach with the present BRT project is demonstrating the lessons of the past have not been learnt. When asked, the CDA has acknowledged it does not have the capacity, nor the desire to deal with a repeat of past destruction in the short term. In view of this, kerbside BRT operations are at significant risk.	
Median bus lane (island stations)	This option provided partial separation from existing operations. However, the propensity for deliberate interference with BRT operations in a lane which is accessible to all vehicles is considered to be too much of a risk to unhindered operations. In many other countries, the combination of a "sense of lane compliance" by the general public combined with an appropriate level of law enforcement by Government could mitigate this impact somewhat. However for Pakistan, the view of the PFS team is that such capacity does not yet exist and to proceed with this option could potentially be a significant risk to the entire BRT project.	
Median lane segregated (island stations)	This option provides a solution to the above concerns. It also provides additional benefits in that (i) when future origin and destination demand profiles become known, and (ii) the then service patterns are being developed to meet these demands, interchanging between services is a simple process where passengers alighting at the station can wait for the relevant service (either in the same direction or otherwise). This will be particularly relevant at stations near the intersections of 9th Avenue and IJP Road and stations near the intersection of 9th Avenue and Jinnah Avenue (for the network identified to date in the PFS). In the longer term, when baseline demand profiles are known and the BRT is able to expand further, additional interchanging stations can be defined. When compared to a kerbside operation, this option provides for a more convenient interchange for passengers wishing to change to services travelling in an	

	alternative direction and where they must cross the road to access these services. In any one corridor, a median alignment reduces the number of stations required and therefore the overall costs (assuming the same standard of station is to be provided). Assuming the same reinforcing treatment for the lane (whether median or kerb) and the provision for passing at stations to accommodate variable service patterns is available for both median and kerbside, it was felt that for Islamabad, with s shortage of capital funds, a median alignment could have cost advantages over the kerbside option. As the CDA has maintained a preference for encouraging the private sector to fund all costs (capital and operating) in return for a 30 year lease on a 21 acre plot in Islamabad for the bulk of the PFS period, the concern over costs is a natural consequence of that preference. This is despite the PFS team advising the CDA on the shortcomings of that approach. In addition, the choice of median alignment in preference to a kerbside lane significantly reduces the potential for lane interference with left hand turning vehicles. In the case of a median alignment, the key concern is how the median breaks are addressed. This is an aspect for the Feasibility Study to address on a site by site basis. Finally, the presence of a segregated and appropriately badged median based station with complementary fleet livery will provide a powerful marketing tool and maintain the BRT system firmly within the minds of the travelling public more so than if the facilities are located on the kerbside and with a background of service road parking and commercial buildings (as per the image on the front cover of this report).	
Median alignment (lateral stations)	When considered against the previous option, this alternative effectively means providing two new lanes, doubling the number of stations and incurring substantial additional costs through the relocation of the median based street lighting system. Moreover, when the issue of passenger interchanging is considered, this option is less convenient than a median based island station option as passengers would be required to cross the alignment to transfer to a bus travelling in the opposite direction. There is a benefit in relation to fleet doors being located on the left hand side of the bus. This means that (assuming synchronisation of platform and bus floor height), a full flex system could be developed from the outset and with full urban area extensions made more readily. However, the issue of the role of the existing transporters in a full flex system was (despite being raised) not able to be settled upon during the PFS. The ongoing engagement and technical limitations of CDA contributed to this lack of response. For these principle reasons, it was considered that (although highly desirable) the reality of a full flex system was not yet practical.	
SERVICE TYPE		
Options considered relevant	***Options assessment***	***Selected option and key determinants***

Full Flex Services (minimal feeder services) Direct Services (minimal feeder services)	In an ideal world, these options are the preferred as it clearly maintains the passenger interest as the priority. At present, the existing transporters provide the services on a licensed but informal basis. Typically, the financial interests of the drivers and conductors are the key priorities at present. Government does not influence this priority through any formal arrangement. In view of this, transforming transporter priorities to a customer focussed one within the same operational arrangements as exist at present and simply by encouraging (or enforcing) a change of transporter attitudes is not considered achievable in the short term. It is at least 5 years away. Full-flex systems require a good level of trust and a sound working relationship between operators Government and the public. Unfortunately Islamabad has none of these critical attributes yet.	The trunk services (with feeder services) is preferred because: (i) The Government is unable to manage a more intimate mixing of a new BRT concept with existing transporters whose opposition (if it materialises) will cause the BRT to fail. (ii) This option allows the transporters to see first hand what the future requires from them. This, combined with engagement from CDA will assist in developing a whole of city integrated network. (iii) This option allows CDA to invest in transporter interchanges (as part of the 10 Year Plan) to support the BRT and demonstrate that it is serious about guaranteeing the future viability of the transporter livelihoods. It is a team approach.
Trunk Services (with feeder services)	A multi pronged approach where operators can see the preference of the customer switching to a quality system (ie the BRT) was considered to be the most practical way to achieve a change in the above transporter priorities. By offering the public a changed arrangement and allowing them to choose, would (in association with ongoing Government liaison) achieve a willingness (on the part of the transporters) to accept that the time has arrived for changes to the way public transport services are provided. Combined with the background setting of the 10 Year Public Transport Plan, this was considered a preferred approach to the challenge ahead. The transporters have been invited to document what role they wished to play in the public transport system of the future. Due to uncertainty, lack of trust with Government, uninformed opinions and the need to consider this paradigm shift in the way the system could develop, no response had been received by the end of the PFS. This reinforced the view that change will not occur rapidly. In the interests of the public (in the short term at least), this seemed to be the most practical option available. There may be a more positive response during a Feasibility Study if this process of engagement and CDA capacity development continues.	
VEHICLE FLOOR HEIGHT		
Options considered relevant	***Options Assessment***	***Selected option and key determinants***
Low floor (level boarding)	Low floor buses are generally preferable due to their being more flexible when (in the case of doors either side) servicing communities in a full flex service network arrangement. In the light of the private sector likely to be funding the fleet for this project, a key consideration was cost. Advice received from the market as part of the PFS process suggested high floor buses were less expensive than low floor buses. In addition, the preferred median based stations when constructed upon the raised median are likely to be at a minimum height in excess of that for a low floor bus (without additional infrastructure design costs). If either of these two observations can be altered as a result of the Feasibility Study, then low floor buses may be preferred.	High floor bus with wide door to allow rapid boarding and alighting is preferred because: (i) It is cheaper for the private sector to fund. (ii) .The median surface is raised and it is considered marginally more
High floor	High floor buses are less expensive however they are less flexible when considering the prospect of servicing a full flex	

(level boarding)	network as the available space on footpaths may restrict where high floor platforms may be located. Moreover a common complaint with the siting of high floor shelters in crowded footpath conditions is that it restricts access to adjacent shops commercial establishments. For this reason, shelters may not be located in the ideal locations and this often has the flow on effect of restricting the effective coverage of the route servicing these shelters. This may present a problem for some areas of Islamabad, however for the most part (and perhaps unlike any other developing city in Asia), the key routes for current and future bus routes have adequate medians for station locations (see as an example Figure 1.1).	cost effective to build on top of the median rather than to excavate it. Therefore platforms are likely to be raised above that required for a low floor bus. (iii) The number of passenger doors per bus can be confirmed during the Feasibility Study. For now, only one is suggested.
STATION SPACING		
Options considered available	Options assessment	Selected option and key determinants
Up to 800 metres (standard bus service)	This provides for a reasonable level of access to the route servicing the stations from a 400 metre walking catchment . While it can be argued that the surrounding street network will ultimately determine the actual walking distance to the station, for practical planning purposes, a spacing of this order was considered a relevant option for this BRT Project. Buses stopping every 800 metres can reduce the competitiveness of the operation relative to private vehicles in the adjacent lane. In this respect, when a mix of service patterns operate on the BRT alignment, this issue is overcome. This will only occur when the details of the baseline demand for travel is known.	Up to 800 metres spacing (depending on land use) is preferred because: (i) The initial BRT network is proposed to operate as a stand alone system. Therefore this additional catchment coverage functionality is required. (ii) In time, when transporters are accepting of the broader need to upgrade and be part of the system, consideration can then be given to develop the secondary network and expand the BRT so that additional coverage is provided. For now, this is all that is considered practical.
Up to 1.5km (for limited stop and express services)	Depending on the surrounding land use, the travel demands of the market being served, and the supporting/complementary bus network within the urban area, viable station spacing may up to 1.5km (or more). In this case, the task of servicing the market is shared between complementary networks. In the case of this BRT Project, the current view is that there is sufficient justification for reducing station spacing on the initial phase of the network (with provision for bus passing at stations) to ensure the demand is maximised at the outset and provided the incentive to expand when a better understanding of baseline travel demands is known.	

Figure 2.5: Selection of BRT Project Components

2.3.2 Alignment, Station and Terminal Locations

The BRT Project corridors seek to provide network coverage while being complementary to, rather than duplicating existing transporter routes. This will help guarantee their long term acceptability by existing operators. Site visits were made along each BRT Project alignment to locate stations based on local conditions, surrounding land uses and ease of access to the station from the kerb. This was done against a background of a station spacing of approximately 800 metres. Terminals were determined based on advice from CDA regarding access limitations to Pak Secretariat and from the suggestions of operators[9].

2.3.3 Bus Specifications

High floor stations and level boarding buses were specified due to (i) need to ensure bus stations are the focus for passenger pick up and set down (as distinct from the current largely pick up and set down on demand operation), (iii) the cheaper cost for operators (capital and maintenance) in the event that the private sector may wish to invest in the fleet, and (iii) the ability to manage the operations of the BRT system as an exclusive operation where only specific vehicles are permitted to enter the bus lanes. This latter aspect is critical to ensure minimal interference from the (often) civil unrest in Pakistan's cities.

2.3.4 Overhead Walkways

These are important means of access to the median stations in the Jinnah Avenue and 9th Avenue corridors. The relatively high speed of general traffic on these divided expressways mandated (for

[9] See Volume 1 Chapter 8.4 for further details.

passenger safety purposes) these walkways. Should there be a similar concern along IJP Road when the BRT Project is operational, these should be installed there as well.

2.4 Project Costs

The indicative capital costs for the BRT Project are estimated at Rs. 7.505 billion (US$ 79.00 million). Figure 2.6 provides a cost outline.

Figure 2.6: BRT Project Capital Costs (Indicative)

Project Component	Cost Estimate	
	RS (Million)	US$ (Million)
Infrastructure		
Stations	2,066.00	21.75
Runningways Construction	1,711.00	18.01
Park and Ride Site	210.00	2.21
Terminals	144.00	1.52
Depot	31.00	0.33
Supporting Infrastructure		
Automatic Fare Collection, RTPI System	1,441.00	15.17
ITS	155.00	1.63
Security System	79.00	0.83
BRT Control Centre	5.00	0.05
Contingency		
Infrastructure @ 10% of Infrastructure Cost	416.00	4.38
Supporting Infrastructure @ 10% of Supporting Infrastructure Cost	168.00	1.77
Fleet Procurement		
Bus Fleet	612.00	6.44
Miscellaneous		
Design @ 5% of total Capital Cost	321.00	3.38
Project Management @ 2% of total Capital Cost	129.00	1.36
Ancilliary Bus Costs @ 3% of Bus Costs	18.00	0.19
Total	**7,505.00**	**79.00**

Source: Consultant estimates
Exchange Rate Assumed: US$ 1.00 = Rs. 95.00 (numbers subject to rounding)

2.5 Estimate of BRT Passenger Demand

The BRT network is based on and represents a compromise of many factors, notably the need to minimize impacts of the BRT on existing transport operators plying various routes. Also, two other factors are destined to have a dramatic positive impact on future BRT ridership and therefore its longer term viability and sustainability. The first of these relates to Government's future approval to extend the BRT into the 'Red Zone' and the 'Pakistan Secretariat' area of Islamabad. This would have a significant positive impact on ridership, as it would transport commuting passengers directly into this area of major employment rather than stopping short of this location as is currently planned. The second factor is the considerable potential to capture a larger share of the substantial Rawalpindi to Islamabad commuter market by connecting the BRT to a future Rawalpindi BRT once it is developed. These two extensions would have a dramatic and almost immediate impact on ridership; where ridership could conceivably increase several-fold. For the purpose of this PFS, these extensions were not available and as a result, the demand estimate excludes this market.

Figure 2.7 summarises the source of the BRT demand estimate based on the trip categories of total travel market as determined by the traffic count surveys undertaken during the PFS and by applying mode shift assumptions based on what could be reasonably expected to materialise (based on BRT impacts elsewhere).

Figure 2.7: Trip Categories and Daily Passenger Flow Estimates

Trip Category	Daily Passenger Estimates

Internal to Internal (Within Islamabad)	– These passengers are likely to be the initial target market since the initial phase of the BRT is (by direction of the counterpart), to be wholly within Islamabad.
	– Internal passenger trips within Islamabad are estimated to be in the region of 695,000 passengers over a 12-hour period, segregated as follows:
	  – Public transport trips: 250,000 trips
	  – Private transport trips: 445,000 trips

Internal to External (From Islamabad) And External to Internal (To Islamabad)	– This category includes passenger trips originating within Islamabad with destinations outside, and trips originating outside of Islamabad with destinations within. – These are relevant since from a BRT system perspective, they represent commuters from Rawalpindi and residential areas to the west of Islamabad. – With the introduction of the BRT system as a high quality and reliable public transport system operating within Islamabad, there is a unique opportunity for passengers travelling into Islamabad to make use of the BRT network for at least part of their trip. – In the early stages of the BRT, prior to connectivity into Rawalpindi and the western sectors, it is anticipated that trips in these two categories will primarily comprise of (a) Rawalpindi residents adjacent to the IJP Road (outside the current study area), and (b) Islamabad residents travelling to Rawalpindi destinations within walking distance of the BRT station in IJP Road. – Estimated passenger trips in this category: 510,000 trips over a 12-hour period.
External to External (Through Islamabad)	– Passenger trips originating outside of Islamabad, passing through Islamabad, and reaching destinations outside of Islamabad. – Estimated passenger trips in this category: 127,500 trips over a 12-hour period. – These trips are not deemed relevant from a BRT perspective, as they are longer distance trips with no requirement to use the BRT system.

Based on this travel market, estimates of a likely daily passenger demand off 42,000 for the BRT has been made (see Figure 2.8). A more detailed account of this estimate is in Volume 1, Chapter 9.

Figure 2.8: Initial Daily Passenger Demand Estimate for the BRT

Passenger Transport	Total per Day	Percent in BRT walk access Range (500 m)	Pax in BRT walk access Range (500 m)	Percent Transition to BRT	BRT Demand Estimate
INTERNAL TRIPS					
Public Transport	250,000	20	50,000	20.0	10,000
Private Vehicles	445,000	20	89,000	3.0	2,670
INTERNAL/EXPERNAL TRIPS					
Not Segregated - (ie private and public transport trips)	510,000			5.0	25,500
				Subtotal for a 12 hour service day	38,170
				Conversion to an 16 hour service day	3,817
				Total for an 16 hour service day	**41,987**

2.6 Estimate of Operating Costs and Revenues

Operating costs have been calculated at Rs 276 million (US$ 2.91 million) per year (net of infrastructure maintenance costs). When a 2 percent allowance for maintenance of infrastructure is included, the annual costs rise to Rs 359 million (US$ 3.78 million). Figure 2.9 provides a breakdown of this. Revenues, based on a daily passenger demand of 42,000 at an average fare of Rs. 30, Rs. 40 or Rs. 50 provides an annual revenue stream of US$ 2.02 million, US$ 2.69 million or US$ 3.37 million respectively. In addition, advertising revenues may add a further 1 percent to the above revenue stream.

Figure 2.9: BRT Annual Operating Costs (Indicative)

Operating Cost Components	Rs (Million)	US$ (Million)
Fuel	130	1.37
Employee Costs	54	0.57
Other Operating Costs (10% of Operating Costs)	33	0.35
Civil Maintenance (2% of Civil Costs)	83	0.87
Control Centre Maintenance (1% of Control Centre Capital Costs)	0.05	0.00
Bus Maintenance	27	0.28
Tyres	14	0.15
Insurance (3% of Bus Capital Costs)	18	0.19
Total Operating Costs	**359**	**3.78**

Source: Consultant estimates.
Exchange Rate Asseumed:US$1.00=RS95.00 (numbers subject to rounding)

2.7 Financial Assessment

On the basis of the above estimates of operating costs and revenues, the estimated cost recovery could vary from 102 percent, 137 percent and 170 percent, depending on the fare to be charged[10]. This estimate, although preliminary should be viewed with considerable caution as fare box revenues of the great majority of BRT systems globally do not cover annual operating costs and is the reason why most BRT systems receive an operating subsidy from Government as part of Government's contribution to the task of providing equitable mobility for all. Moreover, the existing fare of Rs30 provides for a cost recovery estimate of 102 percent and (in the context of this prefeasibility study) represents a risk which would require further analysis as part of a Feasibility Study.

In the event that this market does not materialise as indicated above, the need to penetrate the the Rawalpindi commuter market will become a critical aspect. In addition, passenger revenues may be further guaranteed if Government departments transition their workers from the subsidized worker bus services to the Islamabad BRT system, therefore increasing the BRT farebox revenues. Additional feasibility assessment should therefore evaluate these options as their potential emerges through future developments.

From a capital investment perspective, the assessment has shown that assuming (i) Government funds all capital costs, (ii) the daily patronage is as suggested above,; then the IRR estimates for fare level scenarios of Rs 50, Rs. 40 and Rs. 30; are 14 percent, 11.6 percent and 8.6 percent respectively, and the payback period under these conditions is 15, 17 and 20 years respectively. Clearly the project requires additional patronage to make it a viable investment. This underscores the need to penetrate the estimated 400,000 per day commuter market travelling from Rawalpindi[11].

[10] All financial assessments were undertaken by IPDF from cost estimates supplied by the PFS consultant team
[11] As estimated by the National Transport Research Centre.

2.8 Economic Assessment

Irrespective of the need to provide public subsidies, cities continue to invest in BRT systems on the basis of the economic benefits to be captured by the host city. Such economic benefits include savings in travel time, reduced overall operating costs as mode share shifts to the BRT from private transport, reduction in motor vehicle accidents per passenger distance travelled, and lower levels of pollution. With increased mobility levels to all sections of the urban population, increased employment opportunities are generated and this adds to the economic activity of the city as a whole. While those with access to private transport may be affected by this BRT, the proportionate impact on the poor and women is likely to be much higher due to their existing reliance on (poor, inefficient and largely unregulated) public transport.

In addition, increased connectivity and efficiency of travel makes the BRT system more attractive to businesses along the alignment. This has the flow on effect attracting investment and raising land values; and additional land value capture has the potential to be used as a basis for helping to fund capital infrastructure as the BRT network expands. From an efficiency perspective, the BRT system has the added advantage of moving significantly larger volumes of passenger volumes through congested corridors compared with private vehicles. While corridor congestion is not as pronounced in Islamabad as in many other Asian cities, including Rawalpindi; if the Islamabad BRT is to eventually service the twin cities, then this issue becomes highly relevant.

In summary, quality urban public transport is increasingly being regarded as a critical component of urban services in a modern city environment. While this BRT Project cannot by itself satisfy all these requirements, it is the first step in this direction. Being part of the first Ten-Year Public Transport ever produced for Islamabad, it presents a unique opportunity to deliver significant economic benefits to all sectors of the community. In the future, if it is linked to Rawalpindi, it will then have a marked benefit for the many thousands of commuters relied upon by Islamabad for its economic and commercial vibrancy. These economic and other benefits can be quantified during the Feasibility Study when further details of passenger demand are known.

2.9 Project Construction Program

There is a strong desire within Government to have the BRT project operational as soon as possible. For this reason, the project reflects a modest beginning to a broader BRT network that will serve the entire urban area of Islamabad and (potentially) the contiguous urban area of Rawalpindi. Following further detailed feasibility assessment[12], it is envisioned at this stage that the project can be delivered in two phases. The first phase is constructing a fully functional BRT system, complete with all supporting components that serves Jinnah Ave, 9th Ave and G-9 Markaz to be operational during 2015. Extensions beyond these locations, to the west (and especially to Rawalpindi) can be then be considered[13]. Figure 2.1 shows these future connections.

3 Ten-Year Public Transport Plan

The BRT Project is the priority project for the new ten-year Public Transport Plan (the Plan) developed for Islamabad as part of this PFS. The purpose of the Plan is to provide a direction and focus for the CDA going forward as it seeks to assume responsibility for the future development and management of the urban transport sector. The components of the Plan have been compiled, having regard to priority areas for the ongoing development of the BRT project and the (as yet) limited capacity of CDA to undertake and manage this effort. Its components include the development of (i) a transport demand forecasting model, (ii) a secondary public transport network and (iii) a 'TransMarkaz' program which is to address parking, traffic and non motorized mode requirements in the many commercial areas of the city.

12 As is required through the PC-1 process to receive Planning Commission approval to proceed.

13 Subject to satisfactory resolution of any outstanding security concerns as expressed by existing transporters in response to the civil unrest on Friday September 21, 2012 where protestors damaged up to 20 mini vans were damaged by protesters.

Within the Plan, a five-year Action Plan provides guidance on the immediate steps to be taken by CDA (Figure 3.1). This action plan has as it's principal focus:

1. Establishing capacity within the CDA to plan for, design, manage and monitor progress on well-conceived plans to deliver the ten-year public transport outcomes as envisioned.
2. Planning and implementing the BRT Project as a viable component of a longer-term comprehensive public transport strategy for Islamabad (and potentially Rawalpindi).
3. Undertaking data acquisition for the development of plans and strategies and to develop a public transport demand model as part of a whole-of-transport sector improvement strategy.

Figure 3.1: Five-Year Action Plan

No	Action	Target
1	Prepare and implement the BRT project as per the specifications and recommendations of the PFS team. By end 2015.	Improve public transport for all, especially the disadvantaged. Provide a BRT that is based on a sustainable business model.
2	Commence discussions with Government of Punjab to explore how Rawalpindi may be serviced by the BRT. By end 2013.	Engage stakeholders (Punjab Government and transporters) in meaningful discussions on the matter. Develop a functioning BRT to Rawalpindi by end of 2015. Improve the overall viability of the BRT network.
3	Establish secondary route network. By end 2017.	To complement the BRT routes in providing additional coverage and support for greater public benefit.
4	Conduct travel surveys and establish baseline measurements. By end 2013.	To document and understand the market requirement for urban mobility. To establish baseline mode share levels for subsequent assessment of improvements achieved. To provide the necessary data sets for the development of a robust public transport travel demand model.
5	Identify candidate multimodal interchange sites, prepare network interchange strategy and concept plans. By end 2014.	A simple plan that prioritises a program of interchange upgrades: the prioritisation of the sites to be achieved by a sound technical and socially responsible toolkit method. A set of supporting routes that clearly shows where routes are to be licensed as a result of the interchange upgrades.
6	Undertake surveys at markaz and sectors to determine non-motorized transport needs. By end of 2013.	Prepare a pilot precinct upgrade project for Markaz G-9 that addresses pedestrian precincts, formalized off street parking and cycleway linkages to surrounding sector. Use this as a broad template for subsequent markaz precinct upgrades (with the necessary modifications as required). Include a plan for formalization of taxi stands as a prelude to a city wide strategy. Update traffic ordinances as required
7	Develop a city wide parking strategy. By mid 2014.	Undertake surveys to determine demand prior to reviewing policy options. Then, based on a range of consultation activities, develop policy/ strategy.
8	Commence a community engagement program to assist in the delivery of improvements to urban transport. By end of 2012.	Prepare a communications strategy for each stakeholder group. Commence discussions and incorporate responses into plans. Incorporate this process as a CDA policy requirement on any future projects.
9	Undertake first review of Ten-Year Public Transport Plan. By end 2017.	Review progress on the above eight tasks. Establish priorities for the next five years based on lessons learnt during the first five years.

4 Institutional Landscape

4.1 Sector Status and Challenges

At the federal level, the three key agencies primarily involved in urban transport sector development are the Cabinet Secretariat, the Ministry of Finance and the Ministry of Interior. Regarding the Islamabad transport sector, the key agencies are as follows:

1. **Capital Development Authority (CDA):** The CDA is responsible for implementing municipal functions within the Islamabad Capital Territory (as is the case with local governments in many countries elsewhere). It is mandated in its responsibilities by a number of Ordinances and Acts, and continues to have the overall responsibility for the ongoing spatial development of the urban environment, including land development, road and rail networks, and urban utilities. The CDA has a staff of over 12,500 personnel.

2. **Islamabad Transport Authority (ITA):** The ITA, which is under the Ministry of Interior, is responsible for vehicle licensing matters and issuing passenger carriage permits for buses and taxi services within Islamabad. For public passenger services travelling beyond the ICT into Rawalpindi, the Punjab Transport Authority (PTA) is then responsible for the licensing function within this province. A mutual agreement exists between the ITA and PTA to enable the services to operate legally.
3. **Traffic Police:** The Inspector General Police within the Ministry of Interior is responsible for traffic management and compliance of traffic rules within the ICT. It operates under the Police Act of 1861, and more recently developed Police and Discipline Rules. From the BRT perspective, the tasks of issuing licenses to BRT fleet drivers, ensuring lane exclusivity, and protecting BRT operations and passengers is of relevance, given past experiences with proposed improvements to urban passenger transport services[14].
4. **Infrastructure Projects Development Facility (IPDF):** The IPDF, under the Ministry of Finance, has a specific mandate to assist Government agencies to prepare projects utilizing public/private partnership (PPP) modalities. In this role it provides technical advice and analysis on financial and environmental aspects as part of the development of the business case for transaction purposes. This is a critical component of the Planning Commission's requirement prior to any Government approval being granted for the Project to proceed.

Within these institutional arrangements, it is the private sector however that operates Islamabad's passenger transport services and maintains its fleets. Moreover, due to Government's historic, limited capacity to provide sector leadership and effective management and planning functions, private fleet owners, drivers and conductors operate in a predominately-unregulated environment. As has been the case elsewhere in Pakistan, where Government has attempted to introduce new and improved services in competition with existing operators, civil unrest by existing operators and interests supporting the status quo has seen the failure of these initiatives.

As is the case with many cities within the Asian region, the lack of formal Government involvement in the urban transport sector during past decades has led to a reduced ability of Government to formally intervene when the need for structural changes arise in response to rising urban congestion. This is the case in Islamabad, as despite the falling mode share as more residents revert to private transport, the informal nature of the sector limits what can be achieved without formal Government policy intervention. This aspect received considerable attention during the PFS and as part of the task of appreciating the extent to which the sector 'trusts' Government (particularly the CDA) in dealing with policy and planning matters. The PFS found a gap in this 'trust', which can be mitigated through meaningful engagement and a deeper understanding of sector concerns and requirements going forward.

One-on-one discussions have been held with operator interests as the first step in this process. These discussions revealed demands for CDA to, (i) involve the sector at separate Board Meetings to demonstrate a commitment, (ii) profile the industry in detail so that it understands the sector and the ongoing challenges it faces, (iii) be part of a 'whole-of-Government' approach, and (iv) ensure the protection, safety, security, guarantees and sureties of public transport projects contemplated.

This last item, that of **protection, safety, security, guarantees and sureties** is the challenge before both CDA and Government as a whole as the BRT Project is implemented within the context of the 10 Year Public Transport Plan. Pakistan has previously demonstrated that without the ongoing support of the existing transporters, investments in improvements are at serious risk.

4.2 Implementing and Financing Arrangements

The CDA is the recommended implementing agency for the BRT Project, and in this context, it is keen to optimize private sector involvement through PPP modalities. The recent increase of PPP projects in Pakistan demonstrates the Government's keen desire to consider innovative ways of

[14] See Volume 1, Chapter 4 and Volume 2 Appendix 4 for additional details on this important aspect.

developing and financing infrastructure investments, such as the Islamabad BRT. As previously reported, the IPDF has also been established as an apex PPP facility within the Federal Ministry of Finance, in order to foster the development of PPP projects throughout Pakistan.

Through this PFS process, three BRT financing options have been assessed by the CDA and PFS team; (i) CDA self-financing (ii) Government grants with IFI support, and (iii) financing though PPP modalities, which included the CDA's early interest to include an undeveloped 21-acre land parcel within the city as collateral towards a PPP arrangement with a private sector partner[15]. Following the analysis, it is clear that the most plausible way forward is a mix of options (ii) and (iii), that is, financing through Government grants and available IFI support, with optimized private sector involvement wherever possible. The CDA are currently discussing these options, and the IPDF is advising on possible PPP structures and how to proceed. The IPDF welcomes additional support and guidance from IFIs in this process.

The CDA is lauded for its innovative efforts to finance the BRT Project through PPPs. There is however, limited technical capacity currently to embark on such an endeavor, in particular, given the complexities of the BRT Project. Throughout this PFS process, the CDA's analysis has evolved and matured from its traditional interpretation of PPP projects. From the start of this process, different views have prevailed in the CDA about the plausibility of PPPs; chiefly, that the Project could be designed, built, financed and operated entirely by the private sector, without any Government support apart from the private sector group's lease of an undeveloped 21-acre land parcel within the city, as previously reported.

Questions have also been raised about the legal provisions for PPP projects in Pakistan. Though a national PPP policy does exist, it has yet to be turned into law, which adds to confusion. This has not stopped the CDA and other municipal entities however from entering into PPP transactions, commonly through joint venture. Nevertheless, gradual thinking within the CDA now appears to be shifting to the possibility of accepting that, in order to enter into a PPP framework with the private sector, the CDA needs also to play its part by providing the public infrastructure 'hard assets'. There is therefore a possible paradigm shift away from the concept that the private sector will 'design-build-finance-operate' the entire system with little Government support, through to concepts where CDA is to retain ownership and control of the BRT system, and engage the private sector in the provision and operation of specific components and systems, where their involvement is advantageous to all.

Following recent Government discussions and analysis therefore, and incorporating feedback from a wide range of stakeholders at the two PFS stakeholder workshops, an alternative implementation modality has been identified for the Islamabad BRT[16]. This includes the CDA taking a lead position in the development and implementation of the Project, funded through a blend of financing provided by the CDA, the private sector, and potentially one or several IFIs. Based on this, and having regard for structures that have a proven successful elsewhere, the preferred financing, implementation and management structure for the BRT project is summarized in Figure 4.1.

Figure 4.1: BRT Project Implementation Arrangements

No	Component	Finance	Implement	Manage
1	Legislation	Gov't	Gov't	Gov't
2	Contracts	CDA	CDA	CDA
3	Stations, Runningways, Terminals and Walk Overbridges	CDA	CDA	CDA
4	Ticketing & AFCS, Real Time Passenger Information	PSC	PSC	PSC
5	Closed Circuit Television (CCTV)	CDA	PSC	PSC
6	Fleet (Procurement and Maintenance)	PS	PS	PS
7	Depot	PS	PS	PS
8	Maintenance of Component 3.	PSC	PSC	PSC
9	BRT Control Room	CDA	PSC	CDA
10	BRT Services	PSC	PS	CDA

Note: Gov't – Relevant National Gov't Dep't.; CDA- specifically CDA PSC – Private Sector Contract; PS – Private Sector

15 This includes a 30-year lease on a 21-acre site in Sector I-11 (the I-11 Development).
16 The Second PFS Stakeholder Workshop confirmed this approach.

As shown on Figure 4.1, and for the purposes of this analysis, the BRT system is divided into ten individual components, and for each, the preferred entity to either finance, implement or manage that particular component is shown. The CDA is proposed to have a direct involvement in all aspects to a greater or lesser degree, depending on the specific aspect and this is the basis of the various colours. In the case of Gov't, this refers to the specific National Government Department responsible for that role. For example, the Ministry of Finance (incl IPDF), the Islamabad Transport Authority and the Islamabad Traffic Police will (in addition to the CDA) have a specific role in ensuring the relevant legislative aspects of the project are complied with. These are included here as a separate category to highlight the need for interagency cooperation. In the case of the CDA categories, this indicates the CDA will have the major and direct role in the implementation arrangement. In the case of PSC categories, this suggests a greater role for the private sector in the design, supply and management of the infrastructure in accordance with functional specifications as supplied by CDA. In the case of the PS category, apart from the initial specifications of the component and the ongoing contractual conditions, the private sector will have ultimate responsibility this aspect. The arrangements envisaged for key aspects of the Project are summarized as follows for further reference;

1. The supply and ongoing maintenance of the bus fleet is often a preferred investment item by the private sector. Moreover, it is a logical step in the process of transforming from the often-familiar informal operations to a more formal one where the prospect of operating subsidies exists. Implicit in this arrangement is the preference by the private sector to be responsible for the provision of services. As part of this package, operators prefer (generally) to fund, own and operate their own depot facilities. Experience shows that the private sector is able to undertake these tasks more cost effectively than Government.
2. The provision of a number of system components such as the ticketing system (including the AFCS) is often a role undertaken under a PPP arrangement. Due to the complexities of the financial transactions and the need for transparency (in the eyes of the operators), a third party is often a preferable option. In many cases a private sector consortium, including local banks, are engaged to provide this role.
3. Other supporting infrastructure, such as real time passenger information systems, stations and terminals can be provided through PPP modalities in cases where a defined revenue stream is available and sufficient to engage the private sector. The revenue stream generated by these facilities will normally determine the structure of the PPP. Advertising and (in the case of terminals), land development rights may also be the basis of the PPP.
4. Maintenance of the infrastructure and supporting systems (other than the fleet) are tasks that are also suitable for a PPP modality. This often allows the private sector to offer services at a more efficient and competitive rate than is usually possible by the public sector.

The specific financial arrangements for the Project will be further assessed at the feasibility stage, requiring additional market soundings to confirm the details of PPP arrangements in the Islamabad context. Overall, PPP modalities potentially offer access to new sources of financial and human resources, greater operational efficiencies, and an enhanced likelihood that higher quality public transport services prevail. Often with a strong cash flow and fiscal discipline, the private sector can access financial resources and expertise rapidly should the need arise. As the majority of the BRT operation and maintenance responsibilities shall rest with the private sector once the project is underway, the Project provides an excellent opportunity for the CDA to demonstrate that it has the capacity to engage in complex PPP transactions. This should generate significant kudos for the city locally, regionally and internationally.

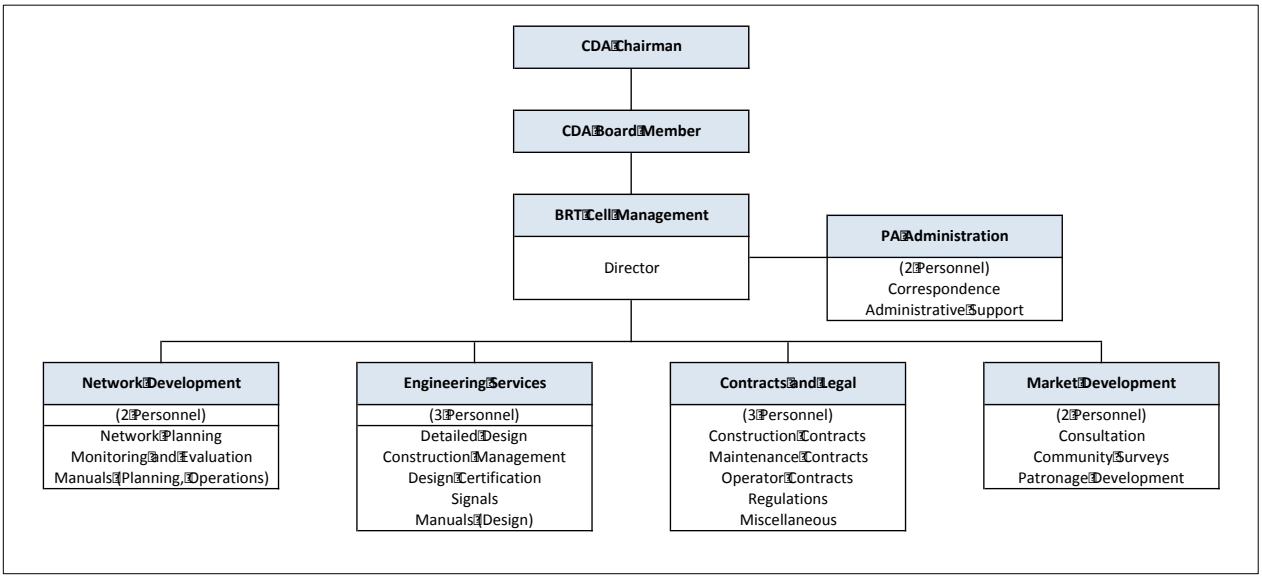
Despite the potential for such gains, the road ahead is not without challenges. Entering into PPP transactions for this Project requires considerable groundwork by the CDA. It will need significant support, and that is why the IPDF is such a critical partner in the BRT project development process. Moreover, any private sector party entering this covenant will need assurances that the CDA will play its part in the PPP framework for the Project. The CDA is also naturally keen to implement this Project in the shortest possible time, as evidenced by the earlier issuance of an EOI for the Project. More time is however needed.

At this juncture, without the BRT linking into the neighboring Rawalpindi city, the Project's bankability is questionable. Once this is achieved however, the Project would be an altogether more financially and economically attractive prospect. All things considered, the PPP procurement cycle process needs to be followed carefully. The IPDF intends to progress this with the CDA in the coming weeks and months. All said, significant progress has been made by the CDA in understanding the complex nature of the Project itself, and what it will take to finance it and eventually launch it. It is work in progress and must be seen within the context of the unique political economy of Islamabad and Pakistan more widely.

4.3 Preparing for the BRT

From a human capital perspective, the Project naturally requires CDA to have sufficient capacity to plan, implement and manage the various and relatively complex elements of the BRT as it develops. Having assumed responsibility for the ten-year Public Transport Plan as well, the CDA has now formally approved the establishment of a specialist group within its organizational structure to function as a dedicated project implementation unit, to be known as the BRT Cell. As shown on Figure 4.2, the initial structure of the cell includes a total of 13 staff, led by a Director, and including four specialist units; network development, engineering services, contract and legal, and market development. A small administration unit also supports the group. In addition to this, it is envisioned that the initial functions of the cell could be greatly enhanced through international technical assistance provided by one or several IFI's if possible. This would be particularly advantageous, as the development and operations of BRT projects are generally complex, and as this Project is pioneering in the Pakistan context.

Figure 4.2: CDA BRT Cell Organization and Functions - Short Term



The BRT Cell has a significant workload over the next six-months in order to prepare for the development and implementation of the Project. Activities include preparing designs and supporting manuals for design, and later, the operations and contract management of system components. Over time, the BRT network should also expand and be supported by a secondary network; and other urban transport improvements will be required, including transporter terminal upgrades and improved integration between the networks. The TransMarkaz program and the development of the public transport demand-forecasting model are also to be the responsibility of the cell.

Over time, and in order to develop other initiatives contained in the ten-year Public Transport Plan, it is envisaged that the BRT Cell will transition into an Urban Transport Wing within CDA. Such a wing will therefore, in time, absorb the functions of the BRT Cell and will assume responsibility for all relevant aspects of the urban transport sector (motorized and non motorized modes). This role, the relevant organisational structure, and the list of priority tasks for immediate action are discussed in Volume 1, Section 12.8.

4.4 Design and Monitoring Framework

A design and monitoring framework has been prepared to assist in project preparation and implementation. It is as follows.

Figure 4.3: Design and Monitoring Framework for the BRT project

Design Summary	Performance Targets/Indicators	Data Sources & Reporting Mechanisms	Assumptions and Risks
Impact • Increase in public transport mode shares • Improved conditions for existing and future bus passengers, especially women. • Reduced emission levels.	• Reduced rate of congestion growth (below 4% increase year on year). • Improved conditions for passengers as reported through feedback surveys. • Increased demand for park and ride sites.	• Traffic counts compared with baseline conditions. • On board passenger satisfaction surveys. • BRT Cell quarterly reports. • CDA Annual Reports. • Social and public perception surveys.	**Assumptions** • Political commitment remains. • Adequate budget to deliver as per PFS model. **Risks** • Political and ICT Agency commitment declines due to elections. • Public rallies damage components. • Natural disasters reallocate Government priorities.
Outcome • A fully functioning BRT system. • A BRT system operating according to a sustainable business model. • Reduced vehicle emissions. • Improved travel conditions for a disillusioned public suffering from existing poor services. • Dedicated seats for women on vehicles. • New model for other cities to follow.	• 15% increase in public transport (driven by the BRT) – measured. • 50% increase in public satisfaction with the introduction of the BRT (measured from baseline conditions). • Acceptance by transporters of BRT as a path for the future. At least 50% increase in support within first 3 months (measured from baseline conditions). • Park and Ride site filled to capacity.	• Initial impact reports. • CDA annual reports. • Improved passenger, social and environmental conditions as per documented monitoring reports. • Community and media feedback reports.	**Assumptions** • Adequate finances to complete project. • Co-operation of all stakeholders in delivering the project. • Political stability during entire process. **Risks** • The CDA priorities change due to political, financial or natural disaster reasons. • CDA elects to vary the business model. • Poor contractual performance.
Output 1 1.1 A CDA BRT Cell with full financing, human resources & accountability to proceed with actions as outlined in the PFS.	By end 2012 • Cell office established and resourced. 20% female employees. • BRT work programme established and funded • Cell reporting progress to CDA Board on a fortnightly basis • Negotiations with CDIA/ADB for assistance with BRT project FS -TA for 2013	• Annual Budget prepared and approved. • BRT Project briefing of 10 respondents to EOI complete with advice that EOI will be reissued in 2013. • Report to CDA Chairman and Board on a quarterly basis re Cell progress and human capacity development.	**Assumptions** • CDA BRT Cell is actually resourced and operational. • Continued support from Chairman. • Finance Structure as per PFS approved by CDA. **Risks** • CELL not established in time. • Inadequate Cell resourcing. • Project finance structure

Design Summary	Performance Targets/Indicators	Data Sources & Reporting Mechanisms	Assumptions and Risks
	in preliminary stage.		not followed. • Inadequate support from stakeholders on project design elements.
Output 2 1.2 Standard Designs for stations, runningways and other BRT project components. BRT Manuals covering network design, operations, contracting and draft BRT Service Contracts as required.	By end Q2 2013 • Detailed designs for runningway, pavement, stations and overhead walkways. • Detailed design for bus priority at intersections. • Functional designs for AFCS and RTPI • Functional design for BRT Control Room. • MOU's signed with Government and transporter stakeholders to proceed with calling for tenders. • Final tenders prepared for issue. • Support of ADB TA with international expertise. • RFPs prepared and issued.	• Project feasibility reports on passenger demand, infrastructure costs. • EIA Report prepared, submitted and approved. • BRT Manuals prepared and approved by Board. • Final Draft of service contracts approved. • Final Draft of component supply and maintenance contracts approved.	**Assumptions** • Finance structure is followed. • Adequate human capacity exists to deliver the advice of the international experts under the TA. • Adequate financial resources are provided and designs are not subject to shortcuts and compromise. • Community engagement is successful and designs are realistic. **Risks** • Interference with design process compromises entire project. • Inadequate resourcing. • Inadequate community engagement.
Output 3 1.3 Financing, BRT project complete.	By end Q3, 2013 • Financing as per agreed Financial Structure complete. • RFPs issued • Assessment of RFPs commenced.	• Project feasibility and appraisal reports complete and approved. • PC1 and PC2 applications approved. • BRT project budget approved.	**Assumptions** • Finance structure followed. • Adequate community support. • PC applications approved. **Risks** • CELL not established in time. • Elections interrupt/cancel support for BRT Project. • Inadequate effective community engagement.
Output 4 1.4 Construction complete, service contracts signed, training underway and baseline surveys complete	By end Q3 2015 • BRT Network ready for commissioning. • BRT concessionaire fully trained and ready to commence operations in accordance with CDA contract specifications. • All baseline measurements complete.	• Detailed designs & construction records. • BRT Cell project progress and completion reports. • Concessionaire road staff fully trained and formally accredited by CDA for BRT operations. • BRT Cell reports on community engagement process and feedback. • Baseline measurement reports.	**Assumption** • CDA and BRT Cell remain committed to delivering according to the financial structure, approved designs and with sound contract management principles and processes. **Risks** • Budget interrupted by political factors.. • Changing CDA priorities. • Vested interests within sector and community result in tensions and poor project outcomes.
Output 5	By end year 2015	• Project progress and	**Assumption**

Design Summary	Performance Targets/Indicators	Data Sources & Reporting Mechanisms	Assumptions and Risks
1.5 BRT commissioning complete, commencement of BRT services.	• BRT Operational and regular monitoring and reporting process in place.	completion reports. • Project performance monitoring and evaluation reports. • BRT operations and passenger reporting.	• CDA allocates adequate resources to the BRT Cell. **Risks** • Failure of CDA to guarantee resources and commitment. • Natural disasters reallocate priorities. .
Activities with Milestones			**Inputs**
1. Establish BRT Cell with adequate financial and human capital to deliver - by end Q4 2012. 2. Submission to ADB for ongoing TA and financial support for the project - by end Q1 2013. 3. Commence preparation of BRT designs and supporting Manuals for ongoing project development reference - by end Q1 2013. 4. Prepare draft relevant legislation to ensure compliance with BRT project by Q1 2013 5. Finalise ToRs for detailed design & demand (FS) and tender - by end Q1 2013. 6. Select preferred FS Consultants to undertake the FS by end Q1 2013 7. Commence regular discussions and engage with stakeholders (transporters and Markaz Chamber of Commerce, ICT Government agencies) - by end Q4 2012. 8. Complete detailed designs of all BRT infrastructure by end - Q2 2013 9. Complete functional designs of AFCS/RTPI, CCTV and SCADA - by end Q1 2013. 10. Issue EOI for AFCS/RTPI, CCTV and SCADA components - by end Q2 2013. 11. Complete detailed designs for all BRT project infrastructure and supporting systems - by end Q3 2013. 12. Continue human capital building - ongoing 13. Select tenders and commence construction of BRT infrastructure by start of Q1 2014 14. Select tenders for AFCS/RTPI, CCTV,SCADA by start of Q2 2014. 15. Commission, manage and maintain the BRT project (according to the various Manuals as developed in line item 3 above) -by end Q3 2015.			**CDIA/Partners:** $ X million • TA Consultants US$XX • FS Team US$ XX • Civil works: US$ XX • Capacity building: US$ XX • Contingencies: US$ XX **Government:** $ XX million • Staff: US$XX • Transport/Logistics: US$XX • Overheads: US$XX • Management: US$XX • Maintenance: US$XX

5. Social Assessment

5.1 Social Context

As a city with approximately 43 percent employees are from government sector[17], a significant proportion of the population may be classified as middle class. However, despite this, some 30 percent of the total population are classified as urban poor with many living in the 34 katchi abadis throughout the urban area. These urban poor are primarily dependent on public transport for their mobility needs. For those who are not classified as urban poor but rely on public transport,

Due to non-availability of decent public transport, general public has to suffer on daily basis as the existing service has no fixed timetables and people have to wait for long time. This situation has been particularly disturbing for students, elderly and women who have to travel daily on public transport. For the 30% of the population classified as urban poor and residing in the 34 katchi abadis, their dependence on public transport for mobility is particularly relevant in this context. The social survey undertaken in this PFS sought to better understand the plight of those dependent on public transport and to gauge their reaction to the benefits a BRT project such as this could offer. The survey covered existing public transport users and households. In the case of the latter, a stratified sample was taken to appreciate the view of lower, middle and upper income level residents.

[17] Census 1998

5.2 Social Assessment

The survey confirmed a widespread disquiet with the public transport services being provided at the present time. This confirmed local media reports during the past decade and highlight the continuing problems such as regular fare gouging, abuse from drivers and conductors, variable (and often lengthy waiting times), seat availability for women and problems with vehicle crowding. As public transport users include those without access to private motorised transport, many are from the poorer sections of the community. Improvements to public transport by the introduction of a quality BRT system will (if funded and managed correctly), go a long way to address these lingering concerns. This is a prime social objective of the BRT project.

From field observations and from the results of surveys, it is clear that for the most part, males comprise the bulk of the market for public transport. Whether this is a function of the work trip being the dominant trip purpose (63 percent in the social survey) or whether the conditions on public transport simply do not encourage use by women is still to be confirmed. What is known however is that compared to the gender split of the general population, males dominate when ridership on public transport is concerned. If this represents suppressed travel opportunities for women, the provision of a quality BRT system, at an affordable price, will help alleviate this social imbalance. While Volume 1, Chapter 5 provides a full account of the findings of the survey, the most relevant findings can be summarised as follows:

1. The current level of dissatisfaction with existing public transport services remains at over 60% of all residents. If the perception of “average” is added to this, the figure rises to over 90%.This confirms a continuation of the situation during the past decade.
2. When presented with the prospect of improvements, and particularly when shown images of a BRT, over 90% of all regular public transport users gave their widespread support for the concept. This suggests (and has been reported in the media), there is an urgent need for improvements of the type currently available via the BRT project.
3. Existing passengers expressed a broad willingness to pay a premium fare for a premium service – the type offered by the BRT project. For these who are generally in the lower income groups, this willingness to pay highlights the priority the poorer sections of the community attach to such improvements.

The social impacts on drivers and conductors on the existing services are seen as the only potential adverse social impact of the BRT project. In view of this, transporters have been consulted and reassured that they can be part of the future plans if they so desire. These discussions continue.

6.0 Environmental Assessment

The key environmental impact is anticipated to be the reduction in emission levels as the BRT mode becomes a mode of choice for an increasing number of travellers. For the purposes of this initial assessment, and in the absence of reliable travel demand data at this stage, the source of the estimated 42,000 passengers per day has been assumed to originate from a number of different sources. In the process, there will be reductions in vehicle movements.

6.1 Estimate of reduction in vehicle movements

The source of the 42,000 passengers has been assessed as coming from:

1. Existing public transport users (10,000 passengers), as the advantages of the BRT option becomes a better alternative for existing users.
2. Cars and motorcycles (5,000 passengers), as the convenience and comfort of the BRT becomes appreciated.
3. Trips originating outside Islamabad but with a destination along the BRT corridor (25,000 passengers). The bulk of these trips are anticipated to access the BRT from Rawalpindi along the IJP Road section of the BRT.

4. Passengers due to the added convenience of travelling to other locations, such as the Blue Area, G-9 or F-10 Markaz, where previously it was too inconvenient to do so (2,000 passengers).

Based on these estimates, the impact on the existing vehicle fleets is estimated as follows.

1. For the 10,000 passengers from existing services, the Project will reduce demand (principally load factors). Based on a full load of 20 passengers per vehicle during the peak period, and with 1,500 wagons operating on the entire network, it has been assumed that when the wagon load in the peak period falls to less than 14, the flow on effect for the rest of the day will reduce the viability of that wagon to a level that it is not operated. On this basis, a reduction of 25 wagons could be expected.
2. For those passengers transferring from cars and motorcycles to the BRT system, the average occupancy of these modes was used as a basis for calculating the reductions. For cars the average occupancy is assumed as 2.6 and for motorcycles, the comparable occupancy is 1.5. On this basis, it has been assumed that there will be a reduction of 1,600 cars and 1,000 motorcycles on the road network as a direct result of the BRT.
3. For those 25,000 trips from outside Islamabad (12,500 each way), it has been assumed that the majority will be from existing public transport services. On this basis, and in accordance with the logic outlined in point (i), it is conjectured that up to 60 wagons could be withdrawn from service.

6.2 Estimate of Reduction in CO_2 Emissions

The BRT Project will have a significant positive impact from a climate change perspective by reducing the greenhouse gas emissions within the urban area. From the estimated 16.520 million reduction in annual kilometres travelled (mainly by low occupancy private vehicles), it is estimated at this PFS stage that this translates into approximately 4,290 tonnes of CO_2 emission savings per year.

7. Project Risks and Beneficiaries

7.1 SWOT and PESTLE Assessment

A preliminary SWOT analysis of the BRT Project has been undertaken to better understand the on-going risks associated with the investment and to highlight where additional actions are required to mitigate these risks[18]. Understanding these aspects will guide the BRT Cell in particular to develop adequate responses in the delivery of the project so that sustainable outcomes can be achieved. A summary of this initial SWOT analysis is listed in Figure 7.1.

Figure 7.1: Summary SWOT Analysis of the BRT Project

Strengths	Weaknesses	Opportunities	Threats
The unique road layout and wide alignments make Islamabad a favourable city in which to implement a BRT Project.	The CDA as the institution seeking to implement this project currently has limited human capacity to plan, implement and manage the BRT Project.	The national Government and CDA are both keen to develop and implement this project. The CDA is proposing the formation of a BRT Cell for this purpose.	A persistence with the desire to implement the original PPP structure involving the 21-acre site and no further Government assistance
The project complies with national urban policy and is strongly supported by Government. The CDA has all the legal powers necessary for the BRT.	The CDA is often mired in controversy to the extent that its ability to "stay the course" on the BRT implementation and management has yet to be confirmed.	The initial EOI as advertised in July 2012 resulted in ten expressions of interest being received. This suggests a broad level of interest from the private sector, given the correct financial structure.	Lack of coordination and cooperation between agencies with regard to licensing and traffic compliance issues.
There is widespread disquiet with existing public	There is a stark lack of up to date urban transport data for	The social survey undertaken during the PFS	Resistance and hesitation from existing transporters

[18] SWOT: strengths, weaknesses, opportunities, threats.

Strengths	Weaknesses	Opportunities	Threats
transport services, strong support for the BRT project, and a willingness (particularly by women) to pay a premium for the improvements BRT brings.	Islamabad. Moreover, the CDA has limited technical and financial capacity and a lack experience in managing and maintaining projects of this nature and magnitude.	has revealed widespread disquiet with the existing services and strong support for the BRT project. This will help sustain a revenue stream.	if they see their future businesses threatened. This was the essential reason for the failure of the Varan Bus Service.
The project components provide a good level of support to women and also the residents of katchi abadis who are disadvantaged by having to rely on existing inadequate services.	CDA suffers from ongoing financial limitations to the extent that (as reported in the media) staff salaries are sometimes in arrears. The capacity to make a financial contribution to the BRT project therefore is limited.	The upcoming national elections may provide a basis for the incumbent party to announce the required funding for the BRT Project as an election commitment.	A lack of systematic monitoring, and absence of an agreed plan to implement the recommendations of the PFS and necessary future FS may undermine the project's viability.

A PESTLE analysis has also been undertaken, in order to assess the BRT Project investment opportunity in terms of its political, economic, social, technological, legal and environmental context[19]. The results of the analysis are presented on Figure 7.2, and this analytical framework should be used in conjunction with the financial and economic assessment to inform financing and implementation strategies going forward into the feasibility assessment and later the Project preparation stages.

Figure 7.2: Summary PESTLE Analysis of the BRT Project

Political	Economic	Social
The upcoming elections may present uncertainty in the short term (that is, within the next 12 months). If commitments are not made before the election, this can lead to uncertainty and even disillusionment, thereby reducing private sector interest in the Project.	The introduction of the BRT will encourage existing passengers to transfer to the BRT. This will have a negative impact on the financial position of selected transporter routes.	No lasting adverse social impacts are anticipated. The alignment along the median will provide additional access rather than reduce access as there will be no additional call on kerb lanes in front of shops and vendor carts.
After the elections, changed priorities might see changes to key public sector staff positions such that the priority of the BRT project diminishes. Either way, after the election, the pressure of Government to ensure the project is implemented reduces.	Infrastructure investment will provide opportunities for additional mobility and improved access to employment and commercial opportunities. This will be particularly relevant for businesses along IJP Road who will now have direct and rapid access to clients in the residential areas along G and F sectors.	Improved service standards through frequency and reliability. Adequate seating for women, barrier free access to stations and level boarding of buses will provide substantial social benefits to those currently unhappy (but captive to) the existing transporter services. Substantial benefits for all members of the public.
There is a review of CDA roles and responsibilities as a result of the ongoing media reports of controversy within CDA operations. This may impact priorities in the short term.	The investment will bring economic benefits through a cleaner environment through reduced air emissions and a more viable public transport system in the long term.	Urban transport improvements by reducing traffic emissions, contributing to a cleaner environment and resulting in better respiratory health.
Technological	**Legal**	**Environmental**
Improvements in urban transport will provide impetus for fleet improvements including fuel-efficient vehicles. The BRT supporting components of AFCS, RTPI, CCTV and BRT Control Room will introduce an era of technological improvements for the public transport sector in general. In time, and with the ten-year Public Transport Plan, this can filter down to all operators.	According to the IPDF, there are no legal impediments to the CDA implementing and managing this BRT project. All that remains as a potential impediment is the means by which CDA acquires funds to make a financial contribution to the Project as per the conclusions of this PFS.	At this PFS stage, no significant adverse environment impacts from the BRT project have been identified. Improvements in urban transport will reduce vehicle emissions. In fact the BRT Project has the potential to reduce the CO2 emissions of the transport sector by 4,290 tons per year.

[19] PESTLE: political, economic, social, technological, legal, environmental.

New policies, planning, community engagement and project implementation needs will require up-skilling and capacity enhancement of the BRT Cell in the short term, and the CDA Urban Transport Wing in the longer term.	New bus priority compliance regime, operation and maintenance and monitoring of fleet and infrastructure will require additional technological skills. It may also require additional by-laws to be introduced.	With increased capacity, the ITA and CDA will be able to insist on and achieve improved compliance with bus emissions.

7.2 BRT Project Beneficiaries and Outcomes

Being part of the ten-year Public Transport Plan, the BRT Project will ultimately act as a catalyst for delivering a broad range of benefits across the entire urban area as the new secondary networks are developed and improvements via the TransMarkaz project are rolled out. In the short term however, the BRT Project, in itself will have a more focussed set of beneficiaries due to its limited coverage and 'stand alone' nature. In summary, the immediate and most obvious benefits will accrue to the (often) disgruntled existing public transport users who are captive to the combined effects of the 'whims' of the existing transporters and the inability of Government to improve the situation. In this context, it must be appreciated that the BRT Project is just the start of a paradigm shift in the way mobility needs are provided for in Islamabad. The beneficiaries in Figure 7.3 reflect this initial phase of the paradigm shift.

Figure 7.3: BRT Project Beneficiaries and Outcomes

Investment Project Component	Beneficiaries	Outcomes	
New BRT stations and terminals with frequent and reliable BRT services	Existing and future public transport passengers	– Improved waiting conditions for bus passengers (passenger comfort and safety)	– Improved service reliability – Improved pedestrian access for the elderly and disabled
	Bus drivers and conductors	– Reduced stress for drivers through less chaos and guaranteed demand – Improved working conditions	– Formal career generated through training and regular employment
	BRT operator and other transporters	– A more efficient operation which supports public transport usage – Retention of mode share increases employment security for drivers – Provides training for additional skills	– Improved business opportunities for Markaz and IJP Road vendors – A viable future for the sector as additional networks are developed via the ten-year Plan
Air-conditioned large Buses with modern depot facilities	Existing and future public transport passengers	– More comfortable and cleaner buses – Improved safety whilst on public transport	– Improved mobility and travel options
	Bus drivers, conductors and fleet owner	– More comfortable working conditions	– Reduced fleet costs through improved maintenance processes
AFCS/RTPI and CCTV Systems	Existing and future public transport passengers	– Added convenience of no fare gouging – Improved service schedule confidence	– Improved safety and security whilst waiting for services
	Fleet Operator	– Improved confidence in on road operations and in meeting contract conditions	– Improved investment returns – Transparency in contract delivery
BRT bus control room	Fleet Operator	– Transparency in contract compliance and (if relevant) subsidy entitlements	– Improved response times to unforseen circumstances and operational emergencies
	CDA	– Improved capacity for contract monitoring and compliance – Improved overall security monitoring capability	– Increased knowledge of bus operations and system planning capability

In summary, and following extensive stakeholder consultations, the two primary risks to this Project are (i) opposition to and direct action from existing transporters and their supporting interests, coupled with (ii) an inability of CDA to address the challenges which lie ahead when establishing policy, planning for, and engaging with stakeholders in the ongoing development of sustainable public transport initiatives. In this regard, CDA has been advised through direct engagement during the PFS that transporters want:

1. Security and protection from the frequent public protests and evidence that Government (including Police), is concerned about their business and is willing to stand by them in times of need.
2. Invitations to attend and be engaged in separate CDA Board and other meetings, where their views and demands can be articulated and incorporated into CDA plans.
3. Evidence that Government is serious about understanding the transport sector, including a detailed profiling of the sector to be utilized in plan preparation activities.
4. Ongoing protection, safety and security for public transport investments contemplated.

8 Additional Studies

This PFS has provided the necessary system concept and associated technical analysis to confirm that a BRT Project is not only required from a social perspective but is physically suited to Islamabad. Moreover, with the potential for extension into the Pak Secretariat, Rawalpindi, and (in time) elsewhere in Islamabad, the long term business case for the BRT is considered to be quite sound. As part of the project preparation process, the feasibility study for the BRT project is therefore the next step in making this a reality.

In addition to the Feasibility Study, the CDA should now consider three key technical activities which are considered the foundation for the successful development of networks as part of the 10 Year Public Transport Plan. The first of these include the development of an urban transport demand forecasting model. A large part of this need stems from the simple fact that there is no formal policy on urban transport for Islamabad nor are there any substantive data on which realistic policies can be based. As such this activity will be the foundation for the development of relevant policies and specific urban transport strategies going forward. As a consequence, and in consideration of the limited human capacity of the CDA in urban transport, the demand forecasting model will be an important addition to the CDA's transport planning toolbox as it will provide the needed credibility in the business cases of transport investment projects as they emerge from the 10 Year Public Transport Plan in the future.

The second key technical activity is the development of the long term BRT network for the urban area (including Rawalpindi) and the secondary route network to work with and complement the BRT. With the knowledge gained from the profiling of the existing transporters[20], input from the demand forecasting model and supporting travel demand management (TDM) policies, the basis of a stable route network as per the 10 Year Public Transport Plan can be created and help deliver a sustainable urban transport system for the city.

The third key technical activity is the development of a comprehensive TransMarkaz Strategy where the best principles of Transit Oriented Development (TOD) can be inaugurated to improve the urban environment at these key (but somewhat decaying) urban activity centres. It will also provide a basis for developing a parking policy which will assist in mitigating the growing congestion at these sites while assisting in retaining market share (and viability) for the public transport sector.

These studies are identified in Volume 1 Chapters 7 and 14 as essential components of the five-year Action Plan. The purpose of these studies is to (i) establish a sound scientific basis for future planning and investment decisions regarding the urban transport sector, and (ii) provide the necessary capacity development of the CDA (both the BRT Cell and the Urban Transport Wing) to take responsibility and leadership for the sector in a professional manner.

[20] As requested by the existing transporters in discussions held during October, 2012.

8.1 Feasibility Study for the BRT Project

With the closure of this Pre-Feasibility phase, a full Feasibility Study (FS) is now recommended for the next phase of Project development. This is required as it will examine in more detail, the business case for the project in the light of additional linkages to the Pak Secretariat and to Rawalpindi. Moreover, it is a Planning Commission requirement that a Feasibility Study be completed and attached to the PC-1 form application for projects such as this, which exceed an investment of Rs 300 million[21].

In this respect, it is considered that additional surveys be undertaken to develop reliable demand estimates for the BRT project (including links to Pak Secretariat and to Rawalpindi For this reason, a key component of the FS should focus on the demand forecasts and revenue estimates and provide input to the Urban Transport Demand Forecasting Model being undertaken as a separate activity. This should form a large part of the technical effort required in the FS. Other tasks required in support of the FS include, but are not necessarily be limited to:

1. Incorporation of CDA prepared concept station designs in medians for cost estimation purposes.
2. Review, amend and upgrade the CDA prepared concept designs for runningways, intersection treatments, elevated station and elevated runningway section, park-and-ride site, stations and terminals into detailed designs for costing and construction purposes.
3. Agree on the source of financing (Government/Private Sector/IFI) for all BRT components.
4. Review the functional specifications (prepared by CDA) for the range of supporting components (AFCS, RTPI, CCTV, Signals, BCR and so on) and issue RFPs and upgrade as necessary for procurement purposes. Undertake detailed market sounding and use this as a basis for the financial analysis.
5. Review cost estimates for remaining BRT Project components based on the detailed designs prepared for the Project.
6. Prepare cost schedules for all relevant components for inputs to the IPDF financial model.
7. Undertake financial analysis and report.
8. Make relevant decisions and proceed as necessary.

The estimated cost of the FS has been estimated at US$ 802,340 (see Figure 8.1). In addition, and as part of the task of developing an adequate human capital within the CDA, a specialist team would be embedded within the CDA to advise, guide and ensure the relevant skills are made available to the CDA. The cost of this TA has been estimated at US$515.900 (see Figure 8.2). These activities can be undertaken concurrently, however it is recommended that separate teams be engaged.

[21] Refer to item 6 on the Planning Commission PC-1 form.

Figure 8.1: Feasibility Study

FEASIBILITY Study on a BRT Project, Islamabad	Cost Estimate				
	No.	Unit	Unit Cost US$	Amount US$	Total US$
International Remuneration					**$ 321,000**
Team leader, BRT Specialist,Urban Transport Planner	6	month	22,000	132000	
BRT Cost Engineer	2	month	18,000	36000	
Architect	1	month	18,000	18000	
Traffic Modeller	3	month	18,000	54000	
Financial & Economic Specialist	1.5	month	18,000	27000	
Environmental Specialist	1.5	month	18,000	27000	
Social Specialist	1.5	month	18,000	27000	
National Remuneration					**$ 200,000**
Deputy Team Leader, Design Engineer	7	month	8,000	56000	
Cost Engineer	2.5	month	6,000	15000	
Finance/PPP Specialist	2	month	6,000	12000	
Quantity Surveyor	1.5	month	6,000	9000	
Traffic Modeller	7	month	6,000	42000	
Institutional Specialist	1	month	6,000	6000	
Social Specialist	7	month	6,000	42000	
Environmental Specialist	3	month	6,000	18000	
Drafter					
Project Expenses (Assumed @40% remuneration costs)					**$ 208,400**
Contingency (10% of remuneration and project expenses costs)					$ 72,940
Total Cost of Feasibility Study					**$ 802,340**

Figure 8.2: Development of Human Capital

Human Capital Development	Cost Estimate				
	No.	Unit	Unit Cost US$	Amount US$	Total US$
International Remuneration					**$ 222,000**
Team leader, BRT Specialist,Urban Transport Planner	6	month	22,000	132000	
BRT Contracts Specialist	2	month	18,000	36000	
Institutional/Train the Trainer	1.5	month	18,000	27000	
Project Financial Management Specialist	1.5	month	18,000	27000	
National Remuneration					**$ 113,000**
Deputy Team Leader, Institutional/Train the Trainer	7	month	8,000	56000	
Social Specialist	7	month	6,000	42000	
Legals/Contracts Specialist	2.5	month	6,000	15000	
Project Expenses (Assumed @40% remuneration costs)					**$ 134,000**
Contingency (10% of remuneration and project expenses costs)					$ 46,900
Total Cost of Feasibility Study					**$ 515,900**

8.2 Urban Transport Demand Forecasting Model

The objective of this initiative is to provide the basic tool for the CDA to assume any type of responsibility to help guide and nurture the development of the sector in a sustainable way. Satisfying urban mobility needs requires a whole-of-urban-area approach, including land use planning as well as travel demand management strategies. The CDA, as the agency responsible for the development of the city, will have this mandate.

This activity should initially include the selection of the correct software platform for the model. Candidate platforms include (but are not limited to) TRANSCAD, CUBE and VISUM. When selecting the software platform, it would be wise to ensure compatibility with that being used/being considered

by the Transport Department, Government of Punjab. The reason for this is that in time, the BRT network may well extend into Rawalpindi, towards the new Airport and other urban areas abutting the Islamabad Highway south and east of Rawalpindi. The model inputs from both the Government of Punjab and the ICT will require a common platform, and it would therefore be unthinkable to have two different platforms. The data inputs for the model will require at least the following tasks and surveys to be undertaken:

1. Prepare a comprehensive O/D zone plan and matrix for modelling inputs and outputs. This zone plan and matrix will need to help develop public transport networks (BRT and feeder routes). As the markaz generates a significant proportion of the travel demand, a simple zone structure based purely on the sector configurations (that is, F-6, F-7 to F14: G-6, G-7 to G14) may not, and probably will not be appropriate. It will need to be able to test route and service scenarios for both the future BRT network and the secondary route network. International expertise, with knowledge of the requirements of this future task, will be a mandatory requirement in completing this task.
2. Stratified household travel surveys which collect data on household characteristics, household and individual trip making, mode used, destination, purpose, travel time details (walk, wait, in vehicle and so on), income level, attitudinal data on modes used, willingness to pay and other items as considered necessary at the time of the survey.
3. Land use documentation by Model Zone so that the travel demand survey data can be matched with land use for demand forecasting purposes.
4. Traffic counts, vehicle occupancy, travel times and other items required as model inputs.
5. Road network details as required by the modelling platform chosen.
6. Model validation as an essential part in determining the accuracy of the tool in forecasting future (i) travel demand, and (ii) mode shares under various scenarios.

When these tasks have been successfully completed, and only then, will CDA be in a position to more accurately undertake detailed assessments of plans for the BRT network extensions, the secondary route network and the development of supporting travel demand strategies (such as a park-and-ride strategy for the urban area, TransMarkaz, a car parking pricing strategy, and other issues) arising out of the ten-year Public Transport Plan.

8.3 Long Term BRT Network Concept Plan and Secondary Route Network

The objective of this study is to prepare a roadmap for the development of the BRT and supporting secondary route network to serve the expanding urban area of the twin cities. As a longer-term strategy, it can be conceptual in nature. However it should represent a logical plan and be able to incorporate the key origins and destinations (such as Rawalpindi and the new Airport) in the concept. When the Urban Transport Demand Forecasting Model becomes operational, the network can be refined to ensure it is appropriate for the future. At that stage, the travel demand model should confirm the optimal longer term extensions to the BRT Project, identify any modifications required and, in conjunction with input from existing transporters, develop the secondary route structure. Detailed service plans can then be confirmed by robust demand (and therefore revenue) forecasts as a basis for informed decision making. Specific tasks for this study will include:

1. Document current land use, travel demand (by mode) for the study area. This includes documenting passenger demand for transporter services.
2. Document passenger demand for the contracted buses providing worker services to the various agencies (for example, the CDA, PKTV, Marriott Hotel, Pak Secretariat workplaces) so that a full account of the demand for public transport is recorded for future planning purposes.
3. Estimate the future land use development patterns and population distribution for the urban area. Use these as a basic logic for defining future demand for public transport services.
4. Document current and planned road improvements so that any future proofing for a BRT corridor extension can be recorded and acted upon during road construction.

5. Prepare the BRT extensions based upon the understanding of the future demand for travel. This task is to be done with extensive consultation with existing transporters so that they may become a part of the network.
6. Prepare a concept secondary network in conjunction with the BRT network so that an integrated and complementary network plan is achieved. Use the secondary network concept developed in this PFS as a starting point.
7. Identify locations for potential park-and-ride sites, secondary route network interchanges, intercity service interchanges and other multimodal interchanges (including rail) as appropriate.
8. Undertake other tasks as required at the time to develop and document a sustainable road map for the long-term development of the BRT network as the backbone of the public transport system for the twin cities.

8.4 TransMarkaz Strategy

The objective of this strategy is to ensure an orderly development and balance of amenity for both motorized and non-motorized modes at the markaz throughout Islamabad. Being the de-facto CBD for many sectors, there is a need (as there is in most CBDs in cities across the world) to ensure that the commercial center remains an attractive destination and the businesses remain viable. From the community's perspective, there is a growing demand for improvements to amenity in these CBDs and this is a prime reason why malls, streetscaping and open-air cafes have become synonymous with successful commercial centres. As both the BRT and the secondary route networks will be focussing on markaz sites for a substantial portion of travel demand, TOD principles are expected to inform this strategy. Specific tasks for this study will include, but not necessarily be limited to:

1. Undertake and document a comparative review of the spatial layout of a number of markaz (to be selected at the time after discussions with CDA) including the number of parking bays, and open space for non-motorized modes.
2. Undertake a survey of the motorized and non-motorized mode turnover rates in these selected markaz. This survey is to document the turnover by (i) road entry/exit location and (ii) within the markaz complex.
3. Undertake a community based survey, targeting a stratified sample of car users, cycle and walk walkers (by gender) to gain a fuller appreciation of community views on current arrangements, where concerns lie and how these concerns may be addressed. Include in this survey, images of suggested improvements (drawn from overseas examples) to assist as necessary. Repeat this with the Markaz Chamber of Commerce and shopkeepers to obtain their views.
4. Document the results of these surveys, discuss with CDA and prepare concept plans highlighting how (from an urban transport perspective) targeted investments in a city wide TransMarkaz program may be achieved. Draw on the ten-year Public Transport Plan and the five-year Action Plan in the PFS for further insights and guidance.
5. Undertake follow up consultation with Markaz Chamber of Commerce, shopkeepers and the community (by public displays and workshops at the markaz sites). Report to CDA and amend plans as necessary.
6. Prepare an implementation plan, a financial structure and agree with stakeholders.
7. Prepare final report for CDA to implement.

9 Next Steps

The next steps to be undertaken are (i) undertake the Feasibility Study and (ii) continue with the capacity development of the CDA to allow it to assume a leadership role in the implementation of the BRT and secondly, to enable it to deliver the ten year Public Transport Plan and in particular, undertake the actions outlined in the 5 year Action plan. These are discussed in detail in Volume 1 Chapter 12. The budgets for these actions are listed in Figure 8.1 and should form the basis of proactive and detailed discussions between CDA, CDIA and IPDF. Figure 9.1 summarises this activity timeline

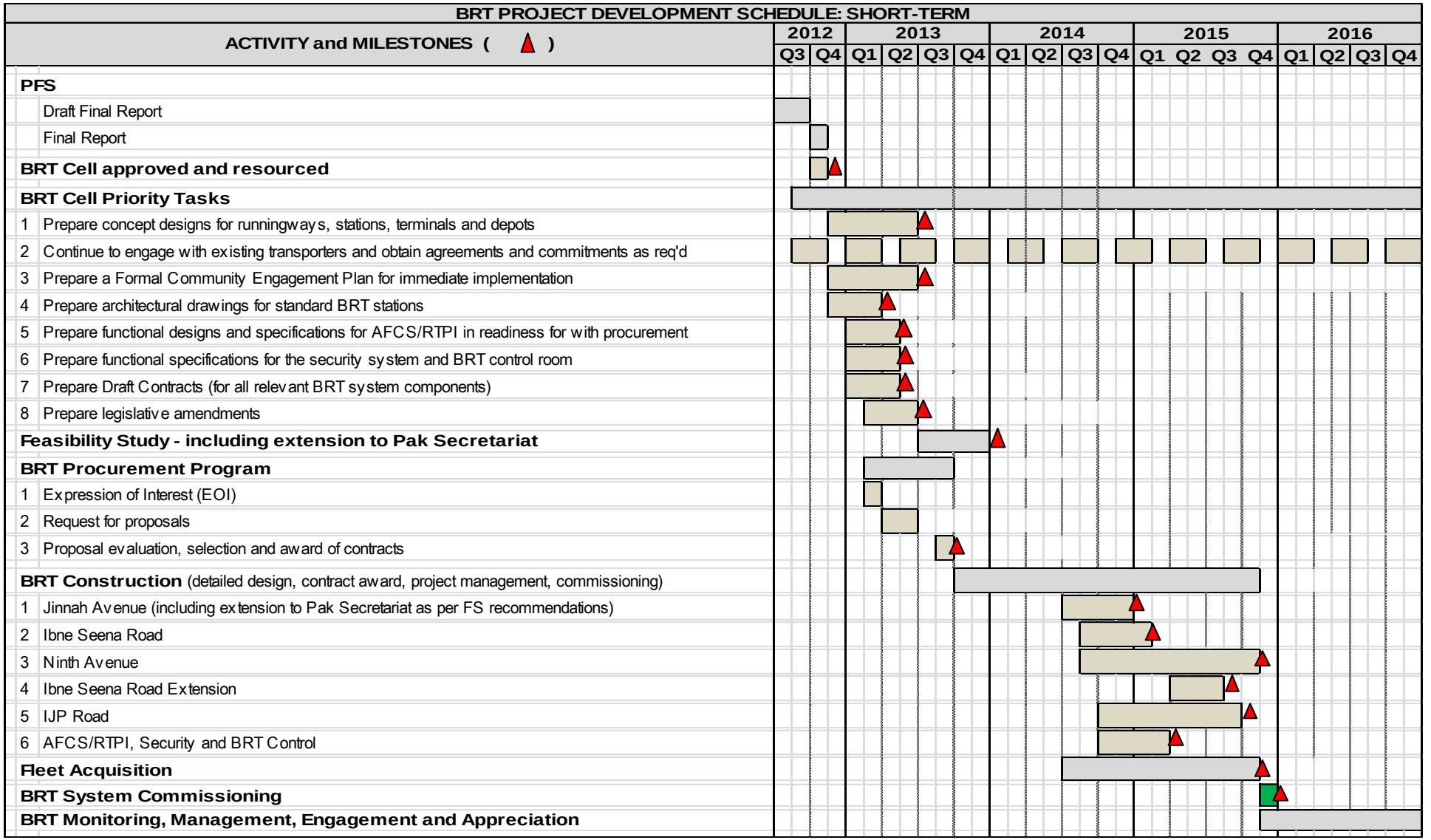



Figure 9.1: BRT Implementation Program