



Establishment of the Dhaka Integrated Transport  
Management Center (DITMC)  
*Transport Operation & Information Center (TOIC) & Bus  
Information & Management System (BIMS)*

People's Republic of Bangladesh

**Project/Program Concept Paper**

31, 12, 2023

<i>Applicant Information</i>	
<b>Name</b>	Shabiha Previn c/o Md. Tusher
<b>Position</b>	Executive Director
<b>Organization</b>	Dhaka Transportation Coordination Authority (DTCA), Road Transport and Highways Division, Ministry of Road Transport and Bridges
<b>Telephone</b>	+88 02 0226603684

<b>E-mail</b>	eddtca60@gmail.com; ed.dtca60@gmail.com
<b>Address</b>	DTCA Bhaban, Tejgaon, Dhaka-1208

## PROJECT/PROGRAM CONCEPT PAPER (PCP)

SECTION 1. BASIC PROJECT INFORMATION		
1.1	<b>Country</b>	Bangladesh
1.2	<b>Title</b>	Establishment of the Dhaka Integrated Transport Management Center (DITMC): <i>Transport Operation &amp; Information Center (TOIC) &amp; Bus Information &amp; Management System (BIMS)</i>
1.3	<b>Location(s)</b>	Dhaka, Bangladesh
1.4	<b>Duration</b>	24 months (2025-2026)
1.5	<b>Budget (total)</b>	US\$ 10.56 million
1.6	<b>Objectives</b>	<p>The DTCA and other Dhaka stakeholders are working towards a total reform of the bus system in Dhaka, much like the way that Seoul reformed its own bus system in the early 2000s. Despite moving forward with some piloting work and small projects, the DTCA now understands that there is a lack of manpower, advanced technologies, technical knowledge, and resources in Dhaka to accomplish this. Dhaka and the DTCA wish to learn from Korea and its experience in reforming its bus systems, partially through the implementation of advanced technologies. As such, we wish to implement/undertake pilot projects for</p> <ol style="list-style-type: none"> <li>1. a transportation monitoring and information center including online platforms for information provision, similar to the Seoul Transport Operation &amp; Information Service (TOPIS); and</li> <li>2. a pilot project for the implementation of Bus Route Rationalization Piloting Corridors, including real-time Bus Information and Management systems (BIMS) and training for operators and management staff; and</li> <li>3. capacity building for public officials, operators, and other staff relating to bus reform, the transportation monitoring center, and BIMS.</li> </ol> <p>The above-mentioned pilot projects will be based in part on the technical specification defined by the recently completed CTCN Technical Assistance (<i>Development of a Framework for Real-Time Transport Information Systems for Public Transport in the Greater Dhaka Area</i>).</p>

1.7	<b>Beneficiary</b>	<p>The beneficiaries of this program will primarily be the Dhaka Transport Coordination Authority (DTCA), as well as the Bangladesh Road Transport Corporation (BRTC), Bangladesh Road Transport Authority (BRTA), Ministry of Road Transport and Bridges, the Dhaka Bus Rapid Transit Company (BRT), and other government organizations.</p> <p>In terms of Dhaka citizenry, the immediate beneficiaries will be any existing and future bus users, who will surely benefit immensely from the provision of real-time information and the better planning that will ensue from its implementation.</p> <p>Buses are mostly used by lower-middle to middle-income dwellers in the city. It is expected that even after the metro rail operation the buses will carry around 35-40% of total daily passenger trips. It is to be noted that about 30 million passenger trips are generated in the city, each day.</p>
1.8	<b>Implementing organization</b>	<i>Dhaka Transport Coordination Authority (DTCA)</i>

<b>SECTION 2. PROJECT RATIONALE</b>	
2.1	<p><b>SITUATION ANALYSIS:</b></p> <p><b>Introduction</b>  Dhaka, the capital and largest city of Bangladesh has experienced rapid population growth in recent decades. The metropolitan area has a population of more than 22 million people, making it one of the most populous cities in the world. It is also one of the densest, with most estimates of the urban area of Dhaka having more than 45,000 persons per square kilometer, which is amongst the highest of any major city in the world. Within this small area, there are somewhere between 4,000 and 10,000 buses (including minibuses) that operate on Dhaka's streets every day, in addition to millions of motorcycles, hundreds of thousands of cars and trucks, tens of thousands of auto-rickshaws (CNGs), and perhaps half a million rickshaws. The government realizes its need to incentivize the use of public transport systems and control the permitted use of automobiles to materialize its mitigation goals and cater to the mobility needs of citizens. In particular, the service quality for public buses should be significantly improved by adopting information and digital technology in its operation and management. Encouraging the use of the public transport system, over the use of private transport, will require making the system more accessible, easier to use, and more convenient for users.</p> <p><b>The Situation in Dhaka</b>  Dhaka is home to numerous public transport modes including a relatively new metro system, cycle rickshaws, taxis, autorickshaws, buses, boats, and a small suburban rail network. From the mobility analysis of the 2015 Rajuk Area Structure Plan for Dhaka, it was concluded that on an average working day about 21 million trips take place in the planning area (greater Dhaka), and of those trips, about 0.5 million are external to the Dhaka area to other areas in Bangladesh. Dhaka itself has a high</p>

mobility rate due to the high population density, from the modal share data, the highest modal share percentage is for rickshaws (38%) and the second highest percentage is for the bus (30%), followed by walking, auto-rickshaw, cars/motorcycles, and finally rail. These mode shares will undoubtedly change significantly as the metro system is built out, and socioeconomic changes occur in Bangladeshi society.

For now, Dhaka has been characterized as a rickshaw city due to the major prevalence of this non-motorized mode in this city. Indeed, Dhaka is often called the “city of rickshaws”, and estimates put the number of rickshaws in the city within the hundreds of thousands, perhaps 500,000. Motorization of the population and the number of cars on the streets is relatively low for a megacity of its size, accounting for less than half a million registered vehicles, with around 800,000 motorcycles.

Vehicle registrations are on the rise, with annual vehicle registrations of motorcycles especially increasing at a rapid rate, with a 126% increase<sup>1</sup> in annual vehicle registrations of motorcycles from 2011 to 2020.

#### *Public Transport*

The Dhaka Metro is a highly anticipated addition to the city's public transportation system. The first line, Line 6, was completed in December 2021 with a further extension in November 2023. With a total length of approximately 22 kilometers, this new metro line connects the northern and southern parts of the city, providing residents with a fast and convenient mode of transportation. A full metro network, designed by the Japan International Cooperation Agency (JICA), will eventually be constructed covering the entire city and serving millions of commuters and residents every day. However, it will be the better part of a decade before the system is fully running. As of 2024, buses remain the main form of public transport other than rickshaws in Dhaka. Around 4,000 – 7,000 vehicles fill the streets of Dhaka every day moving millions of passengers. Over each day, bus departures follow the demand patterns in Dhaka, which follow a familiar pattern of higher demand in morning and afternoon peak periods as seen in many other urban areas.

The DTCA is undertaking a bus reform process to take over the planning of the routes and modernizing the system. A committee was formed to spearhead the project, which was started in 2018. This committee is made up of a variety of stakeholders including members from the City Corporations, BRTA, BRTC, Police, and crucially the Bangladesh Road Transport Owners Association, and Workers Federation. So far, several new policy measures have been implemented, but there remains much more work to be done.

The use of technology and other enhancements has been identified as a key aspect of bus reform. Based on the experiences of the BRTC with a real-time tracking system, they have noted many benefits including safer driving and more efficient operation. However, a Dhaka-wide system that is universally used by all operators is needed.

#### *Telecommunications*

There are more than 180 million mobile subscriptions in Bangladesh, which is a rate per capita of over 1 subscriber per person, indicating that many users have more than one subscription. A very high proportion of households in the country do have access to mobile phones of some kind, at around 97% of households. In urban areas, especially Dhaka, usage of ICT is higher than in rural areas. In Dhaka, 58% of the population had access to the internet, with nearly 70% of households having access

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<sup>1</sup> Bangladesh Road Transport Authority (BRTA), 2021 Bangladesh

	<p>to SmartPhone and 99% having access to a mobile phone of some kind. Women are far less likely to have access to a SmartPhone or the internet than women<sup>2</sup>. Mobile network coverage in Dhaka is generally very good, with all four major mobile operators (Banglalink, Robi-Airtel, Grameenphone, and Teletalk) offering services in the city. 100% of the Dhaka urban area is covered with 2G, 3G, and 4G/LTE networks for all four mobile operators. Mobile phone data is very cheap, with an average price of less than \$0.32 per gigabyte.</p> <p><b>Dynamics of the Bus Sector in Dhaka</b></p> <p>Bangladesh currently lacks the funds and technical ability to implement such a solution. Since the bus system in Dhaka is mostly run by private operators. The private operators will not be able to invest in such systems on their own, and there is no guarantee of profitability for them if they do. Therefore, government intervention, and consequently funding is needed to implement and manage the system. Technologies themselves have been developed and widely used around the world. Systems developed in Korea, for example, are well established and simple to export. Furthermore, private operators almost certainly lack the technical knowledge to implement a system that requires the establishment of set bus stops and routes that are rigorously used with no deviations. As the being undertaken by DTCA continues, the bus operation system will become increasingly more planned and governed by central authorities. which will allow the system to be more useful. With funding in place, the BIMS can be implemented methodically and universally with all operators under the control of a central system.</p>
<p><b>2.2</b></p>	<p><b>COUNTRY DEVELOPMENT STRATEGIES AND POLICIES:</b> Please describe how the Project relates to other relevant national development strategies and policies, and provide the ongoing status of their implementation, results and effects, if any.</p> <p><b>International / National Policies</b></p> <p><i>GHG Emissions &amp; Nationally Determined Contributions (NDCs)</i></p> <p>Bangladesh is a country that is vulnerable to the impacts of climate change, with frequent flooding, cyclones, and other natural disasters causing significant damage to the country's infrastructure and economy. As a result, the government of Bangladesh has set several environmental goals to address these challenges and promote sustainable development.</p> <p>NDCs, or Nationally Determined Contributions, are commitments made by countries under the United Nations Framework Convention on Climate Change (UNFCCC) to reduce their Greenhouse Gas (GHG) emissions and address the impacts of climate change. These commitments are part of the Paris Agreement, which is an international treaty signed by countries around the world to combat climate change. Bangladesh is a signatory to the Paris Agreement, and it has submitted its NDCs to the UNFCCC. In terms of mitigation, Bangladesh has developed two scenarios for NDCs (unconditional and conditional). Transport is forecasted to account for a 32.89 Mt CO<sub>2</sub>e reduction (12.30% unconditional) and 26.56 Mt CO<sub>2</sub>e reduction (10.23% conditional). According to the NDCs, policies that will reduce the GHGs from a change in fuel, and the introduction of the metro system. However overall and to date, few transport projects or policies have been identified that will contribute. New policies</p>

<sup>2</sup> Bangladesh Bureau of Statistics (BBS), 2022 Census (ICT)

and projects that will increase the attractiveness of public transport and avoid more traffic congestion are needed.

#### *UN Sustainable Development Goals (SDGs)*

The Bangladesh government ratified the UN SDGs. Relevant SDGs for Bangladesh include SDG 11 (*Make cities and Human settlement inclusive, safe, resilient, and sustainable*) specifically, by 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport with special attention to the needs of those in vulnerable situations, women, and children, persons with disabilities and older persons.

Under this goal the sub goal 11.2, directly related to public transport and RTHD is the lead Ministry. Public transport system will also facilitate special arrangement for woman and persons with disabilities including special fares for older people and children etc.

#### *8<sup>th</sup> Five-year Plan (2020 – 2025)*

Overall goals of the eighth five-year plan for the development of Bangladesh include Overall Goals include recovering from the COVID-19 pandemic, Restore human health, confidence, employment, and economic activity.

Accelerate GDP growth and employment: Achieve 8% average annual growth rate and reduce poverty from 20.5% to 15.6%. Promote prosperity and inclusivity: Narrow inequality and improve living standards for all citizens. Attain Upper Middle-Income Country (UMIC) status by 2031. Align with Sustainable Development Goals (SDGs). There are plans to import public transport, especially in the Dhaka metro area and reduce traffic congestion while promoting “green” transportation and improving the accessibility of public transport for marginalized individuals.

### **Regional**

#### *Dhaka Bus Rationalization Project*

The bus system in Dhaka is currently inconvenient, unsafe, and unreliable, frustrating current users. At the same time, the rising economy of Bangladesh will lead to more and more private vehicle ownership; most of these new vehicles will be powered by fossil fuels and will contribute to the worsening traffic situation in Dhaka. Reforms are needed for the Dhaka bus system, and one major component of reforming the bus system will be technological enhancements including a bus information and management system (BIMS) which can significantly increase the efficiency and convenience of the bus system overall, and thus increase ridership/maintain on this sustainable transportation mode.

A 10-member coordination committee was formed back in 2018, chaired by the Honorable Mayor, Dhaka South City Corporation to rationalize the prevailing bus routes, develop a bus management system through company-based operation, and introduce a bus route franchising system in Dhaka City. Dhaka Transport Coordination Authority (DTCA) is providing necessary technical and administrative support. Initially in clusters (6 Urban & 3 suburban, each having different distinguishable colors such as red, green, blue, pink, orange, etc.), 22 companies and 42 routes have been proposed for implementation of bus route rationalization for Dhaka city.

As per the decision of the committee, a pilot bus service named *Dhaka Nagar Paribahan* was inaugurated on 26th December 2021 in a route (Route No. 21) with a total number of 50 buses including 30 double-deckers. In the first phase (piloting), a total of 54 routes currently running in the Green Cluster have been combined into 8

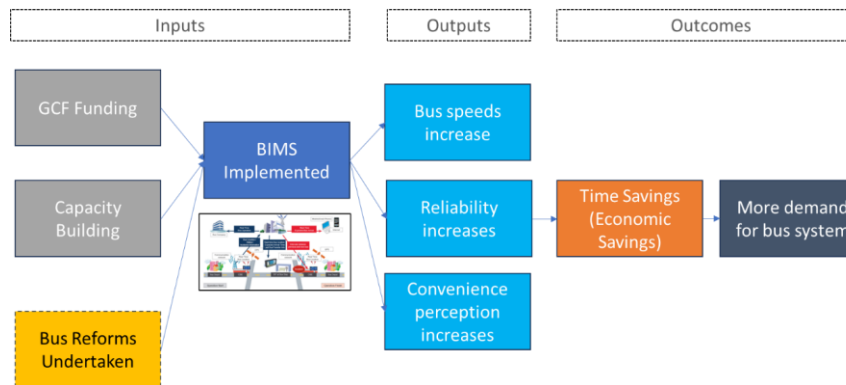
	<p>routes (from Route No. 21 to Route No. 28). Route No. 22 &amp; 26 was inaugurated on 13th October 2022. There is a plan to complete the Green Cluster operation by the year 2023.</p> <p>Around 70 bus stops have already been built and land acquisition for the construction of four bus depot/terminals in the vicinity of Dhaka for inter-district buses and one layover terminal for city buses are in progress. Once built, the three (namely Sayedabad, Mohakhali, and Gabtoli) inter-district terminals will be converted into city bus terminals. The renovation of the city bus terminal at Sayedabad and Mohakhali is also underway by the municipal governments.</p> <p>Also, DTCA has taken up a project named "Preparation of Concept Design &amp; Implementation Plan for Bus Route Rationalization and Company-based Operation of Bus Service in Dhaka". This project will complement these works and provide all necessary technical support for this process. DOHWA Engineering Company Limited, Korea, is the lead consultant for the work. The main scopes of the project are developing a public transport demand model (with public transport O-D matrix), location and suitability analysis for the bus stop and bus bay locations, conceptual design of Bus Information System, business model development for bus operation and management, preparation of project proposal for bus procurement and contracts, facilitating the ongoing bus route rationalization work etc.</p>
2.3	<p><b>JUSTIFICATION FOR INTERVENTION:</b> Please describe how the need for the Project was determined, and what the rationale/justification for the Project (why the Project is considered to be the most effective way the problem is resolved.)</p> <p><b>Overview</b></p> <p>The bus system in Dhaka is currently inconvenient, unsafe, and unreliable frustrating current users, to an extreme sense of the word. At the same time, the rising economy of Bangladesh will lead to more and more private vehicle ownership; most of these new vehicles will be powered by fossil fuels and will contribute to the worsening traffic situation in Dhaka. Reforms are needed for the Dhaka bus system, and one major component of reforming the bus system will be technological enhancements including a bus information and management system (BIMS) which can significantly increase the efficiency and convenience of the bus system overall, and thus increase ridership/maintain on this sustainable transportation mode.:</p> <p><i>Benefits from a BIMS</i></p> <p>Due to the enormous daily ridership on the Dhaka bus system, if fully implemented, the system could save an equally enormous amount of time and therefore have a large benefit, with knock-on economic effects as individuals have more time to put towards other economic activity. The following table shows the potential perceived/actual savings in hours and equivalent monetary value. The implementation of a BMS could potentially have a hypothetical socioeconomic value of around USD 210 million annually<sup>3</sup>, for bus customers alone. Additionally, BIMS can significantly increase operational efficiency, thus allowing for cost savings for operators as well. In many cities around the world (large and small), BIMS is simply an essential part of the public transport system. Further, the BIMS be part of greater reforms and systems to</p>

<sup>3</sup> When fully implemented. Please refer to the attached report from the CTCN Technical Assistance: *Development of a Framework for Real-Time Transport Information Systems for Public Transport in the Greater Dhaka Area (Technical Framework Report)*

the bus network that will create more efficient services and consequently enhance mobility and decrease traffic congestion in Dhaka, which is considered amongst the most heavily congested in the world. In 2022, the annual cost of congestion to the Bangladesh economy was estimated to be approximately \$6.5 billion USD<sup>4</sup> or up to 10% of GDP. Previous BIMS systems have been known to increase operation efficiency by up to 10%<sup>3</sup>, which could result in a decrease of operating distances by Dhaka buses of around 48,000 km per day, equivalent to \$xxx USD/day or \$xxx annually<sup>3</sup>. This efficiency will have enormous knock-on effects in the Dhaka case, as it is known that the inefficient operation of buses is one of the major causes of congestion today in Dhaka, and any increase in their efficiency will increase the efficiency of the roads to an even greater degree.

**The socioeconomic benefits of BIMS in the Dhaka case are likely to far outweigh the costs associated with implementation.**

The theory of change associated with monitoring and BIMS systems is shown below



By increasing the actual and perceived convenience of the public bus transport system, the overall system becomes more useful, and people who would have otherwise switched to private transport, will continue to use public transport and potentially people who have access to private transport, may choose not to use it if the bus system is convenient enough. This could result in a reduction in Greenhouse Gases (GHGs). Specifically, GHG reductions may come from (1) a modal shift, that is, people who previously used fossil fuel-powered private vehicles will instead switch to public transport, thus reducing the overall vehicle-kilometers traveled (VKT) in the region and consequently the amount of fuel burned (which produces GHGs); and (2) a reduction in operating distances of buses due to an increase in operating efficiency (and therefore also reducing fuel burn).

Item <sup>3</sup>	Hours	Value (\$USD 2023)
Time savings, daily	256,000	\$0.7 million
Time savings, annual	76.7 million	\$210 million

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<sup>4</sup> <https://www.dhakatribune.com/business/265726/the-economic-cost-of-dhaka%E2%80%99s-insane-traffic>

Time savings, 10-year	769 million	\$2,100 million
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The main benefit for bus users is an increase in information and convenience which causes them to experience better, more enjoyable, and more reliable journeys. Individuals who have used passengers' information (or perceive) that they save an average of 2.5 minutes per journey on average (the average bus journey length is 43 minutes in Dhaka according to reported values). Therefore, the time savings is significant (5-6% on average). This may result in a reduction in GHGs. Specifically, GHG reductions may come from (1) a modal shift, that is, people who previously used fossil fuel-powered private vehicles will instead switch to public transport, thus reducing the overall vehicle-kilometers traveled (VKT) in the region and consequently the amount of fuel burned, which in turn produces GHGs. And (2) a reduction in operating miles due to an increase in operating efficiency (and therefore fuel burn). The total GHG reductions are summarized in the table below. Total GHG reductions could amount to just over 200 tonnes of CO2e per day of operation.

Item <sup>3</sup>	Daily Tonnes Removed (CO2e)	Annual Tonnes removed (CO2e)
Reductions from passenger activity	180	54,000
Reductions from operator activity	30	9,000
Total	210	63,000

**LESSONS LEARNED:** Please describe what lessons Partner Country has drawn on (from Partner Country's own and other's past experience) in designing this Project.

**CTCN Technical Assistance**

From January to December 2023, the CTCN Technical Assistance (TA) for Bangladesh entitled: *Development of a Framework for Real-Time Transport Information Systems for Public Transport in the Greater Dhaka Area* was undertaken. This TA was completed by Korea National University of Transportation (KNUT) and information and equipment are based on Korean standards. This framework forms the basis for this conceptual note. Additionally, as part of this project, the DTCA was introduced to the history of bus reforms in Seoul from the early 2000s, which provides inspiration and a framework for how to accomplish the same or similar reforms in Dhaka.

2.4

This project established a baseline with data and information available in Dhaka, and developed a framework for the Dhaka Integrated Transport Management Center (DITMC) including management center systems and BIMS including the required equipment, technical specifications of the equipment, cost breakdown, overview of the benefits of BIMS, a review of data and information and mock-ups for the Dhaka case, a review of the bus reform and how to include technology in reform efforts, geographical review and potential pilot projects for Dhaka as well as concluding remarks and summaries.

Previous experience in the country has shown that accomplishing the bus reform is a difficult and onerous task that will take years and hard dedication. The DTCA cannot

accomplish this on its own, but with the partnership and most importantly technologies and experience of Korea, the chances of success will increase drastically.

**Experience and Efficiencies in Investment Cooperation**

Korea has been recognized as one of the world's most technologically advanced countries. Especially, it is specialized in railway industry.

In recent years, Government in Bangladesh has closely cooperated with Korea International Cooperation Agency (KOICA) and Korea Import-Export Bank (K-EXIM) and Korea companies successfully completed the Transport Infra projects, using KOICA ODA, EDCF funds, as follows

- 'Establishing a data center and web-portal system for digital BRTA project (2014)',
- 'Master plan for water supply and sewerage system management in Chittagong, Bangladesh (2007)',
- 'Feasibility study for construction of the railway cum road bridge across the river Karnaphuli (2015)',
- 'Feasibility study for modernization of railway signaling system of 25 stations in Bangladesh (1st) (2009)',
- "Feasibility study for modernization of railway signaling system in Bangladesh (2nd) (2018)' and so on.

In addition to that, Korean companies have won several railway projects from Bangladesh government as follows.

- Consulting services for modernization project of signaling system (11 stations) from Chinki Astana to Chittagong in Bangladesh (2013, BR)
- Rolling stock procurement consulting in Bangladesh (2013, BR)
- Construction supervision works for construction of Akhaura and Laksam double track (2016, BR)
- Feasibility study, detail design and tender preparation for Bangabandhu-Payra port railway (2018, BR)
- Procurement consulting for 20 Meter gauge rolling stocks (2018, BR)

Through the co-operation with Korean contractors, Bangladesh contractors also approach and learn new and advanced technologies suitable to the economic, cultural, and ecological environment in Bangladesh.

**SECTION 3. PROJECT DESCRIPTION**

**Objective/Outcome/Output:** Please outline the objectives, the expected outcomes, and outputs of the Project.

**Objective**

3.1

Dhaka and the DTCA wish to learn from Korea and its experience in reforming its bus systems, partially through the implementation of advanced technologies. As such, we wish to implement/undertake the following pilot projects:

1. a transportation monitoring and information center including online platforms for information provision, similar to the Seoul Transport Operation & Information Service (TOPIS); and

2. a pilot project for the implementation of Bus Route Rationalization Piloting Corridors, including real-time Bus Information and Management systems (BIMS) and training for operators and management staff; and
3. capacity building for public officials, operators, and other staff relating to bus reform, the transportation monitoring center, and BIMS.

The above-mentioned pilot projects will be based in part on the technical specification defined by the recently completed CTCN Technical Assistance (*Development of a Framework for Real-Time Transport Information Systems for Public Transport in the Greater Dhaka Area*).

*Target site (location)*

Establishment of the Dhaka Integrated Transport Management Center (DITMC) consisting of a management center and piloting of a BIMS for the Bus Route Rationalization Piloting Corridors, Circular and Shuttle Bus Services. The Circular and Shuttle Bus Services operate in Gulshan and Hatirjheel areas (map attached in Annex 1). The bus route rationalization piloting corridors are mainly in the Mohammapur, Dhanmondi, Motijheel, and Jatrabari areas.

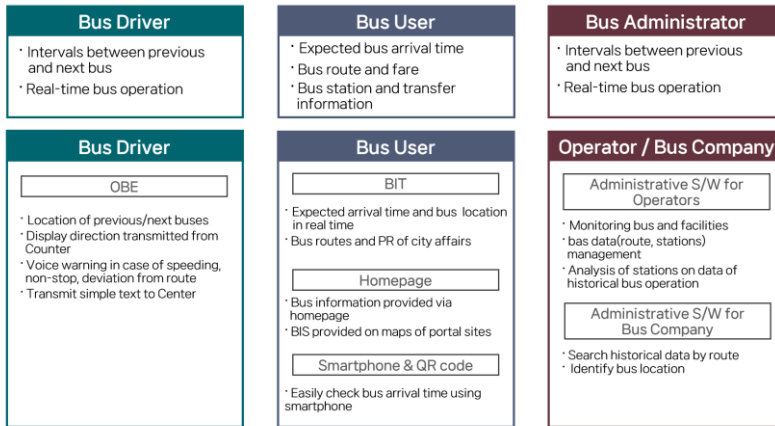
*Expected output:*

- a fully functional and operational Bus Information and Management System (BIMS); and a
- a centralized management center;
- the development of a bus operation system to introduce a bus franchising system (bus reform plan and operation system)
- capacity building drivers, operators, and public officials; and
- publicity and promotion for public transport and creation of awareness

**Overview of BIMS**

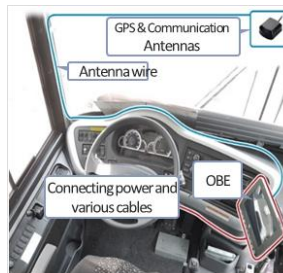
BIMS is made up of two distinct but related technology systems, the Bus Management Systems (BMS) and Bus Information Systems (BIS). BMS are systems and technologies that are generally used by the bus operator. They include tracking devices, management systems, and software. BMS can be used by bus operators or government agencies to significantly improve efficiency in operation and manage headways, and drivers, monitor for accidents and incidents, and have many other benefits. BIS refers to the systems, technologies, and devices that communicate the location of buses to customers.

BIMS can provide information to many different groups: bus drivers, customers (passengers), bus operation companies, and management authorities, see below.



### On-Board Equipment

On-board units (OBUs) are the devices that are installed in vehicles to enable real-time tracking and monitoring of their location and other important parameters. OBUs may be small devices with no Human-Machine Interface (HMI), meaning there is no way for the driver to interact with it, to larger units with screens that can provide the operator with additional driving features, as well as the ability to receive messages from a central dispatch (known as Computer-Aided Dispatch, CAD). The bus location tracking method uses a Global positioning system (GPS) and communication via existing wireless network infrastructure. The OBUs continuously measure longitude, latitude, and altitude generally reporting this information to a central management center every 20-30 seconds.



### Bus Stop Equipment

Bus stop equipment consists of devices used to communicate information about the buses and their schedules to passengers who are waiting for the bus. The most important item is the Bus Information Terminals (BIT), which are electronic information displays that can provide real-time or scheduled information on bus schedules, routes, and arrival times at bus stops. While there are many ways to provide bus information to customers including with physical infrastructure at bus stops, equipment within the buses themselves, via the internet, websites, text message, or by ARS. However, the BIT is the most convenient and accessible way to provide information to public transport users, as it can easily be used by anyone, even if they do not have access to a SmartPhone or the internet.



*Hardware / Management Center*

A high-quality management center is crucial for a bus operating management company to efficiently oversee and coordinate its bus operations center. The management center must be outfitted with high-quality hardware and act as the central communication node to connect with the software, communication network, and hardware in the center itself. Several hardware pieces will be required, especially servers and operation/monitoring terminals. A total of eight different servers within the management center would be required, each with specific functions. In addition, some office space and subsequent renovations will be needed to build the management center.

*Software*

Software for BIMS is complex and consists of numerous systems and subsystems including software for data collection, server operation, data processing, and analysis in addition to the three most important functions are dispatch (for operations) and monitoring and management (for management/planning agencies), and information provision (for passengers and operators). The former is known as real-time passenger information (RTPI) or simply passenger information and the latter is computer-aided dispatch (CAD).

**Activities:** Please describe what will be carried out in terms of planned activities, their timing and duration, and who will be responsible for each activity. It should indicate the sequence of all major activities and implementation milestones.

**3.2 Project Activities**

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**Budget:** Please provide a brief requirement by activities. The budget requirement is not a full and well-defined. The detailed budget requirement will be fully elaborated after the PCP is selected. Nevertheless, this information is to help KOICA to better understand the project.

**3.3**

Activity	Contents	Proposed budget (in USD)
Management Center	Severs, computers, monitoring systems, office equipment, etc.	\$4,330,000
On-Board Equipment	GPS trackers, operator computers etc. for 300 vehicles	\$1,070,000
Bus Stop Equipment	Bus Information Terminals (BITs) for 50 bus stops (100 BITs)	\$1,410,000
Operation, maintenance, advisory & consulting services	Labor	\$2,400,000
Training, publicity, engagement & advertisement	Labor & equipment	\$870,000

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Workshop/maintenance & repair	Equipment & Property	\$480,000
See attached document (Annex 1)		
<b>Total</b>		<b>\$10,560,000</b>

#### SECTION 4. STAKEHOLDER ANALYSIS

	<p><b>TARGET BENEFICIARY:</b> Please describe the following information: a) direct and indirect/wider beneficiary group, b) number of beneficiary, with gender segregation if necessary (e.g. 300 children rather than children in 3 schools), c) how the target group was identified, d) why they were selected as target group, e) how intended beneficiaries have been involved in Project design, and their expected role in Project implementation and evaluation. If relevant, the target group needs be disaggregated by sex.</p>
4.1	<p>In terms of Dhaka citizenry, the immediate beneficiaries will be any existing and future bus users who will use the pilot target corridors (Gulshan and Hartijheel).</p> <p>Overall, buses in Dhaka are mostly used by lower-middle to middle-income dwellers in the city. It is expected that even after the metro rail operation the buses will carry around 35-40% of total daily passenger trips. It is to be noted that about 30 million passenger trips are generated in the city each day, with at least 5- 6 million trips on the bus system. Upon future full roll-out, all bus users will benefit from the system in place.</p>
	<p><b>OTHER STAKEHOLDERS:</b> Please describe other stakeholders (e.g. partner government agency, international organization, NGO, donor agency, etc.), if any, including a) name/group, b) respective role(s) and cooperation/coordination mechanism, etc.</p>
4.2	<p>Besides the project management teams, the following organizations have interest in the project and will be included as official stakeholder:</p> <ul style="list-style-type: none"> <li>• Bangladesh Road Transport Corporation (BRTC)</li> <li>• Bangladesh Road Transportation Authority (BRTA)</li> <li>• Ministry of Road Transport and Bridges</li> <li>• Dhaka Bus Rapid Transit Company (BRT), and other government organizations.</li> </ul> <p>Other potential stakeholders from the Korean side include</p> <ul style="list-style-type: none"> <li>• KOTRA (Dhaka office)</li> <li>• Korea National University of Transportation (KNUT)</li> <li>• University of Seoul (UOS)</li> </ul>

#### SECTION 5. PROJECT MANAGEMENT AND IMPLEMENTATION

<b>5.1</b>	<p><b>PROJECT MANAGEMENT:</b> Please describe a) who will be responsible for planning and management of the Project operations as well as coordinating other bodies and organizations associated with the Project, b) what arrangements will be established to ensure that there will be effective coordination with other relevant programs and activities.</p>
	<p><b>Main organization:</b></p> <ul style="list-style-type: none"> <li>• Dhaka Transport Coordination Authority (DTCA) of the Roads and Transport Division (RTHD), Ministry of Road Transport and Bridges.</li> </ul> <p><i>Other organizations:</i></p> <ul style="list-style-type: none"> <li>• Dhaka South City Corporation (DSCC)</li> <li>• Dhaka North City Corporation (DNCC),</li> <li>• Rajdhani Unnayan Kartripakkha (RAJUK, Capital Development Authority), Bangladesh Road Transport Authority (BRTA)</li> <li>• Roads and Highways Department (RHD)</li> <li>• Dhaka Metropolitan Police (DMP)</li> </ul> <p><i>Undertakings of the host countries</i></p> <ul style="list-style-type: none"> <li>• The Government of Bangladesh will take initiative for the infrastructural development.</li> <li>• DTCA will provide the required space for a management center or workshop</li> <li>• DTCA will provide office space for the project.</li> </ul>

**Commented [DF7]:** DTCA to check this section and replace as necessary.

The following documents as annexes, are required to be submitted with the PCP.

**Annex 1: Project location / maps**

**Annex 2: Estimated budgets**

**Annex 3: Development of a Framework for Real-Time Transport Information Systems for Public Transport in the Greater Dhaka Area (CTCN Technical Assistance)**