

The Study on Strengthening Intermodal Transfer Functions of Urban Railway Systems

Final Report Summary



September 2009

Japan International Cooperation Agency (JICA)

Value Planning International, Inc.

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List of Acronyms/Abbreviations

CBD	Central business District
DDA	Delhi Development Authority
DF/R	Draft Final Report
DMC	Delhi Municipal Corporation
DMRC	Delhi Metro Railway Corporation
DTC	Delhi Transport Corporation
F/R	Final Report
GNCTD	The Government of National Capital Territory of Delhi
ISBT	Inter State Bus Terminal (This is one of three ISBTs of Delhi)
IC/R	Inception Report
IT/R	Interim Report
JICA	Japan International Cooperation Agency
MoUD	Ministry of Urban Development
MoR	Ministry of Railway
MCD	Municipal Corporation of Delhi
NDMC	New Delhi Municipal Corporation
NMCD	Municipal Corporation of New Delhi
ODA	Official Development Assistance

Executive Summary

“Study on Strengthening Intermodal Transfer Functions of Urban Railway Systems”

1. Study Objectives

This study was conducted by Japan International Cooperation Agency to identify current problems and vital issues of intermodal transfer functions at railway stations and to formulate improvement measures for the intermodal transfer functions to facilitate more passengers' use of the railway systems. The target of this study is to build an effective promotion policy for public transportation usage in Delhi Metropolitan Area, by improving intermodal transfer functions of the stations, and the expected outcome is to prepare strategic projects and / or programs to implement the above policy. The outcomes of this study are expected to be a model for other cities.

2. Awareness of Issues for Intermodal Transfer Functions of Delhi Metro Stations

The residents and employees around four (4) Metro Stations in different category groups of Metro stations were interview-surveyed and the following issues were identified.

Table 1 Awareness of Issues of Metro Users

Station	Priority Issue	Other Issues
Station Category 1 (SHAHDARA)	Insufficient Access Bus Service (Route, Frequency, Punctuality)	<ul style="list-style-type: none">• Space for Auto Rickshaw / Rickshaw Stand / Drop-Off;• Private Vehicle Facilities / Parking
Station Category 2 (JANAK PURI WEST)	Insufficient Access Bus Service (Route, Frequency, Punctuality)	<ul style="list-style-type: none">• Free Passage with Escalator / Elevator in the Station;• Pedestrian Facilities
Station Category 3 (UTTAM NAGAR WEST)	No Wide Road for Feeder Buses	<ul style="list-style-type: none">• Space for Auto Rickshaw / Rickshaw Stand / Drop-Off;• Private Vehicle Facilities / Parking
Station Category 4 (RAJIV CHOWK)	Space for Auto Rickshaw/ Rickshaw Stand / Drop-Off	<ul style="list-style-type: none">• Space for Access Bus Facilities;• Security Check Line

Source: JICA Study Team

Table 2 Reasons for Non-Metro Users not to Use the Metro

Station	Priority Issue	Other Issues
Station Category 1 (SHAHDARA)	Travel Cost	Insufficient Access Transport Means; Discomfort of the Metro
Station Category 2 (JANAK PURI WEST)	Travel Cost	Insufficient Access Transport Means; Frequency of the Metro
Station Category 3 (UTTAM NAGAR WEST)	Insufficient Access Transport Means	Travel Cost; Inconvenience of Transfers
Station Category 4 (RAJIV CHOWK)	Travel Cost	Insufficient Access Transport Means; Discomfort of the Metro

Source: JICA Study Team

Table 3 Awareness of Issues of Transfer Passengers with Other Modes

Transfer Mode	Priority Issue	Other Issues
To/from Indian Railway	Station Facilities (New Ticket Vending Machine, Waiting Facility, Security Line, Escalator, etc.)	Insufficient Indian Railway Service (Frequency, Punctuality, etc.) Pedestrian Facilities
To/from DTC Bus	Station Facilities (Same as above)	Insufficient Access Bus Service (Route, Frequency, Punctuality) Pedestrian Facilities
Motorcycle Park & Ride	Private Vehicle Facilities / Parking	Station Facilities (Same as above) Pedestrian Facilities
Car Park & Ride	Private Vehicle Facilities / Parking	Station Facilities (Same as above) Pedestrian Facilities

Source: JICA Study Team

3. Improvement Measures

The improvement measures were studied based on the requirements identified by the survey. The major issues in the suburban stations are how to enhance the bus service level by providing effective bus route and bus stops with more frequency and punctuality to enable to attract more Metro users, and how to restructure and redevelop the intermodal transfer spaces around the stations for the bus going in/out and car / motorcycle parking based on the intermodal demand. On the other hand, the major issues in the central business district are how to provide the spaces for auto rickshaw / rickshaw and access buses to enhance the accessibility to / from the Metro station.

Table 4 Improvement Requirement identified by the Survey

Station	Access Road and Feeder Bus System	Intermodal Transfer Functions around Station
Station Category 1 (SHAHDARA)	Enhancement of Bus Service Level (New Routes & Stops, Frequency, Punctuality, etc.)	<ul style="list-style-type: none"> • Provide More Spaces for Auto Rickshaw / Rickshaw Stand / Drop-Off • Private Vehicle Facilities / Parking
Station Category 2 (JANAK PURI WEST)	Enhancement of Bus Service Level (New Route & Stop, Frequency, Punctuality)	<ul style="list-style-type: none"> • Provide Free Passage with Escalator / Elevator in the Station • Develop Pedestrian Facilities
Station Category 3 (UTTAM NAGAR WEST)	Urban Development for Providing Bus Roads	<ul style="list-style-type: none"> • Space for Auto Rickshaw / Rickshaw Stand / Drop-Off • Private Vehicle Facilities / Parking
Station Category 4 (RAJIV CHOWK)	Provision of Access Bus Facilities near Station	<ul style="list-style-type: none"> • Provision of Auto Rickshaw / Rickshaw Stand / Drop-Off Facility near Station • Improve Security Check Line System
Transfer Functions with Other Modes	<ul style="list-style-type: none"> • Improve Station Facilities (New Ticket Vending Machine, Waiting Facility, Security Check Line, Escalator, etc.) • Enhance Indian Railway Service Level (Frequency, Punctuality, etc.) • Improve Access Bus Service (New Route & Stop, Frequency, Punctuality, etc.) • Provide More Private Vehicle Facilities / Car & Motorcycle Parking • Provide Comfortable Pedestrian Facilities with Green Shelter • Review the Fare System and Synchronize the Timetable of Different Modes 	

Source: JICA Study Team

4. Implementation System

It is important to review the existing urban master plan both on the land use and transport for the redevelopment of the catchment influence area of the station. The intermodal transfer functions should be incorporated as one of the important urban facilities. The legally authorized planning and implementation system is expected to be organized for developing the intermodal transfer functions together with the financial support system of the government. The citizen's participation in the development of intermodal transfer functions is inevitable and the utilization of private vitality has to be studied for the redevelopment of the station area. The following two organizations are expected to be established to promote and strengthen the intermodal transfer functions of the urban railway system.

Figure 1 Proposed Organization of “Delhi Metro Intermodal Transfer Committee (DMITC)”

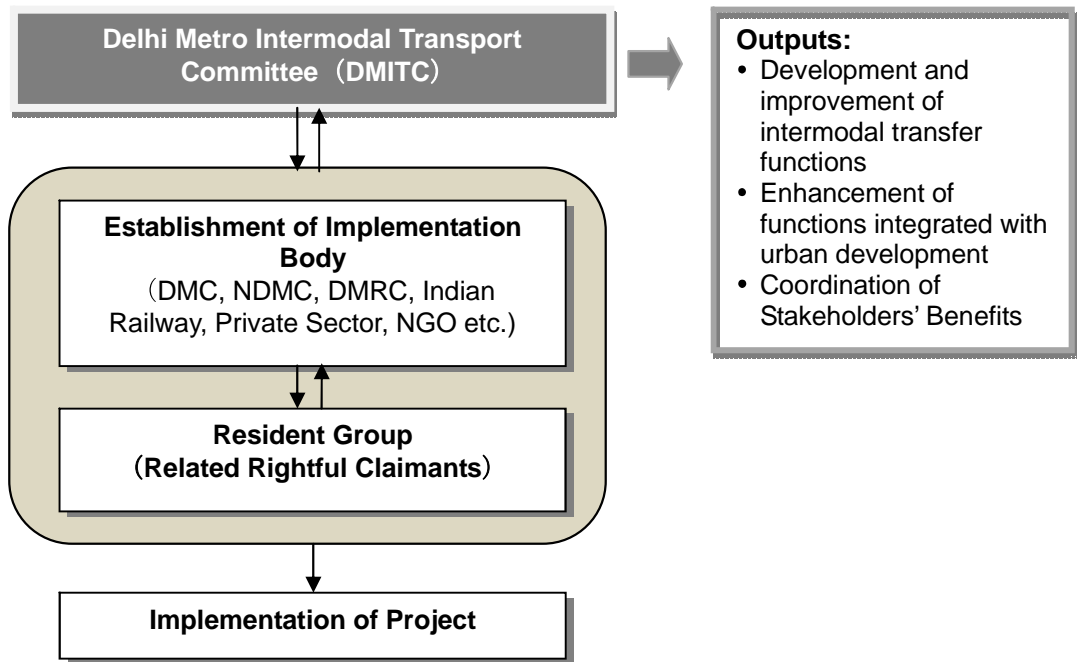
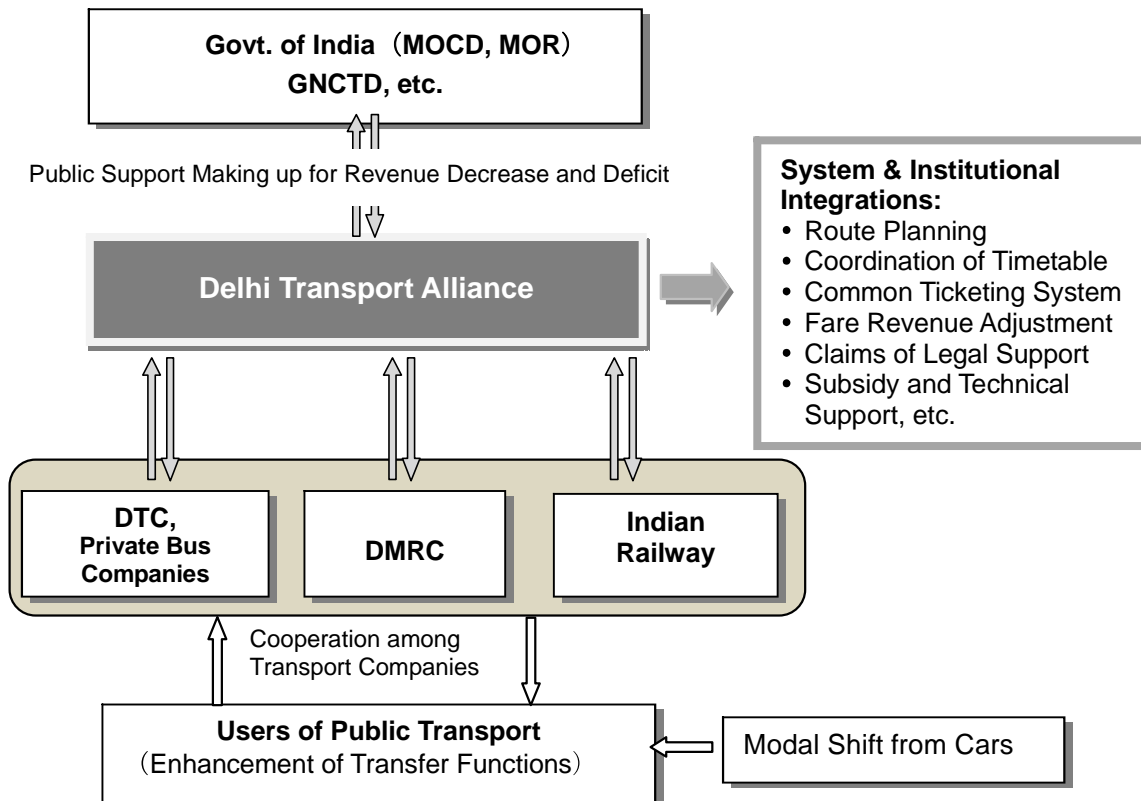


Figure 2 Proposed Organizational Structure of “Delhi Transport Alliance (DTA)”



1 . Introduction

1.1 Study Objectives

The main objective of this study is to identify current problems and vital issues of intermodal transfer functions at railway stations in the railway systems developed by the Yen loans, and to formulate improvement measures for the intermodal transfer functions to facilitate more passenger use of the railway systems.

As a case study, the current situation of the Delhi Metro stations was investigated, and a Questionnaire Survey was conducted to identify actual usage of passengers of the Delhi Metro and potential demands on facilities and services to improve transfer activities. Based on this case study, improvement measures for the intermodal transfer function in Delhi Metro were examined, especially taking into account strengthening of integration with feeder transport systems including pedestrian facilities.

An organizational structure was explored to promote coordination among public transport service providers (railway, the Metro, bus, taxi, etc.) and the city government authorities in charge of urban development and environmental administration. Consequently, strategic projects and/or programs have been proposed. The results of this study will be applicable to not only Delhi Metro but also other railway projects.

Target of the Study: to build an effective promotion policy for public transportation usage in Delhi Metropolitan Area, by improving the intermodal transfer function of the stations

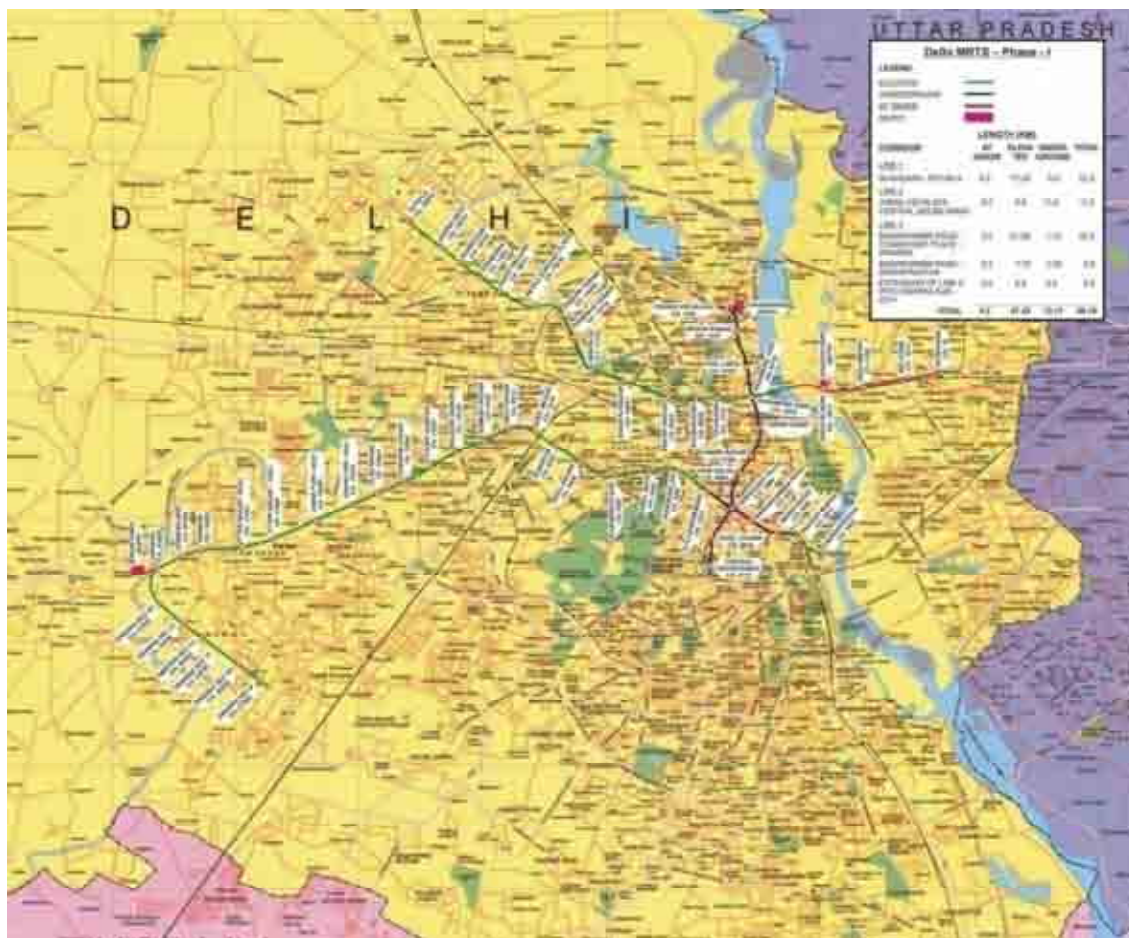
Expected Outcomes: to prepare strategic projects and/or programs to implement the policy above. The outcome of this study is expected to be a model for other cities.

1.2 Study Area

A literature study covers the worldwide discussion relevant to railway intermodal transfer systems, and a case study shall focus on Delhi Metropolitan Area being served by Delhi Metro System, which has three lines with a combined route length of 65 km and 59 stations in Phase 1.



Figure 1.1 Case Study Area Being Served by the Delhi Metro System



Source: Web-site of DMRC

Table 1.1 Profile of Delhi Metro Phase 1

	Total (km)	At grade (km)	Elevated (km)	Underground (km)	Station
Line 1	25.1	4.5	17.50	0.0	21
Line 2	17.36	0.0	6.36	11.0	15
Line 3	32.1	0.0	29.93	2.17	31
Total	74.56	4.5	53.79	13.17	67

Source: DMRC

1.3 General Characteristics of the Case Study Area, Delhi

Delhi Metropolitan Area, with a population of 16.3 million as of 2006, has developed a public transportation network system with bus, Metro, taxi, and paratransit systems. In particular, bus is the prime mode, accounting for approximately 30-35% of the total demand.

The Delhi Metro System, which consists of both with underground structure in the central business district (CBD) and elevated structure in suburban areas, has been well developed and rapidly expanded to widen the service areas. This system does/will play a prime role in the overall public transport network under the condition that chronically heavy traffic congestions always take place on roads. The Metro System is expected to contribute to mitigate the ambient air pollution.

Phase 1 of the Delhi Metro System Project (65.1 km long) had been financially supported by Japanese Yen Loan since 1996 with a total loan amount of JYN.162 billion. The whole Phase 1 section was completed and opened for commercial operation in November 2006, and it is reported that about 800,000 passengers are currently using the system every day.

At present, in order to meet the increasing demand, Phase 2 of the Project has been implemented to construct 83 km more with an additional financial support (JYN. 178 billion), and it is scheduled to be completed by 2011. Including Phase 3 and Phase 4, the total length of the Metro network will be 414 km in 2021.

2 .Underlying Issues on Intermodal Functions at Railway Stations

2.1 Overall Profile of Urban Railway Projects by Japanese Yen Loans

Started in Korea for the railway improvement project, a total of 205 yen loan projects in the railway sector have been carried out, and the total amount from 1966 to 2008 accounts for JYN. 2,390,503 million. Among them, 67 projects with JYN. 633,481 million loan have been carried out in **China**, sharing 26.5% of the total, followed by **Thailand** (21 projects, JYN. 391,085 million, 16.4% share); **India** (16 projects, JYN. 346,762 million, 14.5% share); and **Indonesia** (40 projects, JYN. 266,942 million, 11.2% share) . These four countries accounts for 68.5% of the total yen loan projects in the railway sector.

Among the 205 yen roan railway projects, the following seven urban railway projects are particularly noted in terms of scale and functions. The characteristics of these projects are summarized in Table 2.1.

Table 2.1 Representative Yen Loan Projects in the Railway Sector

Country	Project	Period	Amount Yen Loan	Lengths	Characteristics
China	Beijing Subway Project, Phase 1 and 2	1988~89 1991~94	JY.4 bill. (88-89); JY.15.7 bill. (91-94)	199.0km	The project was planned to ease traffic congestions and air pollution; the 1 st Line enters directly into the Beijing downtown; Inadequate transfer facilities due to the station's location in deep underground; hard to move between ground level and station.
China	Chongqing Monorail Project	2001 - 2007	JY.22.8 bill.	17.4km	First monorail system in China with inconvenient access to the service due to the stations' locations in residential area of city and topographical conditions; and Using Japanese technology with an aim to mitigate traffic congestions and air pollution.
Indonesia	Jabotabek Rail Modernization Project, Phase 1 - 9	82/05/31-9 2/10/08	JY.1,049 bill.	161.9km	Outstanding Yen loan project that continued 20 years. First project with a long-term master plan, supported by Japanese technical assistance; Introduction of used-rolling stocks from Japan; and integration of both utilization of existing railways and developing new urban railway.

Philippines	Metro Manila LRT Project	1993 - 2005	JY.1,048 bill.	15km	Three (3) LRT lines are introduced by Belgium, Japan, and Czech Republic, therefore, holding a difficulty to assure integrated operation under the entire railway network. The 1 st Line has faced chronic congestion.
Thailand	Bangkok Blue Line Project, Phase 1-5	1996 - 2000	JY.193 bill.	20km	Introduction of a subway system under swampy soil conditions, based on the Greater Bangkok Master Plan. Construction was started in 1997. The total construction cost of US\$2.7 billion was mostly provided by yen loans.
India	Kolkata Metro Construction Project	1983~1992	JY.4.8 bill.	5.0km	The project without any long-term plans had supported the project, therefore, faced with serious problems such as delay in the construction and expansion of the budget. Number of ridership is considerably lower than an expectation, still facing problems such as irregular operation intervals, delay in development of the East- West Line, poor coordination with feeder bus services and so on. Given a longer network of the Metro with East-West Line, the ridership of the Metro as a whole is expected to grow, as its network utility will increase.
India	Delhi Metro System Development Project	1997~2008	JY.2,633 bill.	75.3km	Step by step development, based on a long term plan. Integrated management for user promotion such as feeder bus, car parking in stations, and real estate development at main stations. Technical assistance for the operation and management has been associated with infrastructure development project. The station facilities are well developed with a high standard, but station plaza and intermodal facilities still remain for further improvement.

Source: JICA Study Team

2.2 Delhi Metro Questionnaire Survey

The Questionnaire Survey on Delhi Metro and Intermodal Transfer Facilities aims at understanding current usage of the Metro and clarifying what aspects Metro users are satisfied with and dissatisfied with, especially focusing on the intermodal transfer function of each Metro station. Metro stations should be located and designed to promote the shift to the Metro from other transportation modes and to maximize Metro users' utility level.

(1) Target Stations for the Survey

Metro stations can be classified into several groups based on the characteristics of each station. A representative station has been selected from each group and the Questionnaire Survey has been conducted around this station as the main target. The selected representative stations

from four groups are: SHAHDARA; JANAKPURI WEST; UTTAM NAGAR WEST; and RAJIV CHOWK, and these stations' location characteristics are as shown in Table 2.2.

Table 2.2 Selected Representative Stations and Their Characteristics

	SHAHDARA	JANAK PURI WEST	UTTAM NAGAR WEST	RAJIV CHOWK
Location	Suburban	City	City	Central Business District
Station Plaza	Existing	No	No	No
Car Parking	Existing	Existing	No	No
Surrounding Development by DMRC	Existing	No	No	No

Source: JICA Study Team

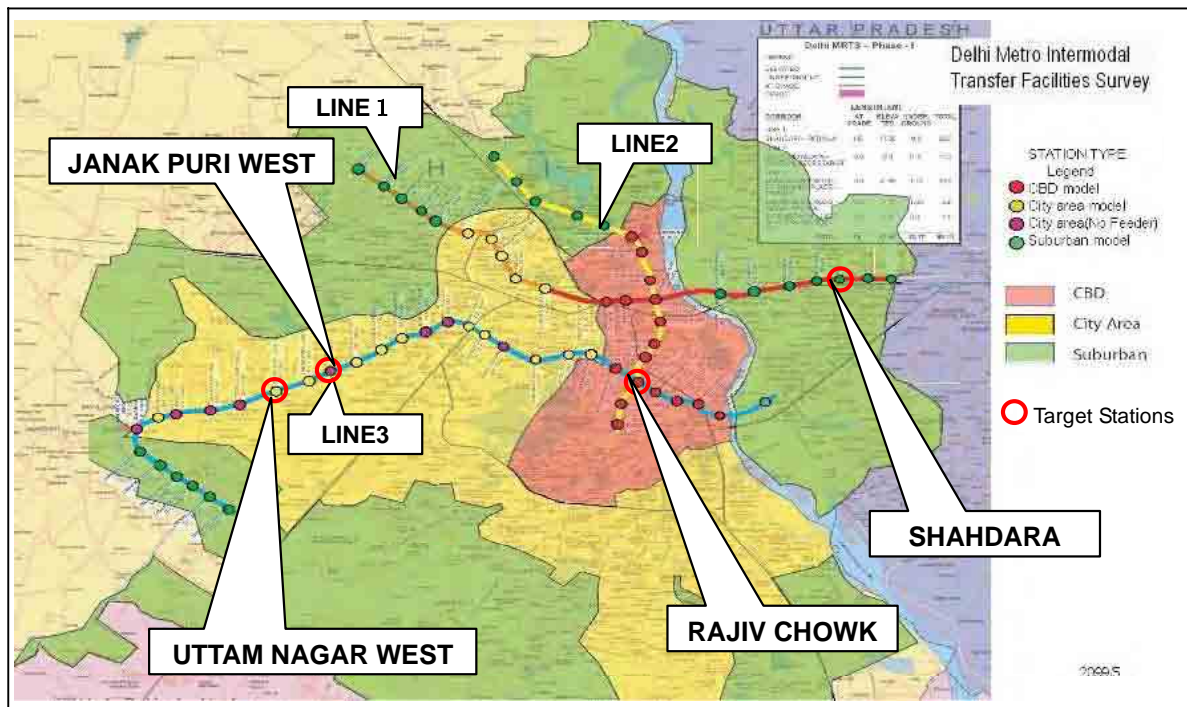


Figure 2.1 Locations of Selected Stations

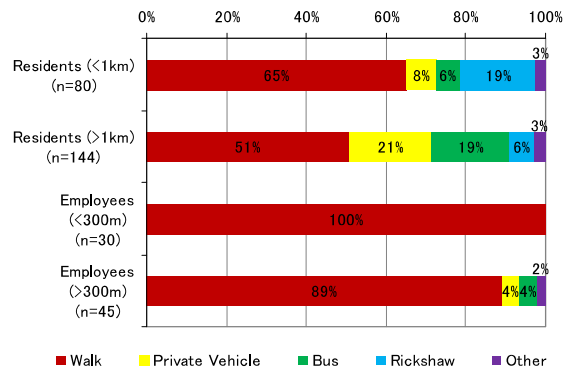
(2) Sample Size

A total of 500 sample households were randomly selected for the four representative stations, that is, 125 samples for each type of the station. Samples were selected in consideration of the conditions of their residential places in terms of physical distance from the stations, availability of feeder bus services, and convenience of their transportation modes, so on. For the supplemental survey, additional 400 Metro passengers were interviewed.

2.3 Metro Users’ Improvement Needs for Intermodal Transfer Functions

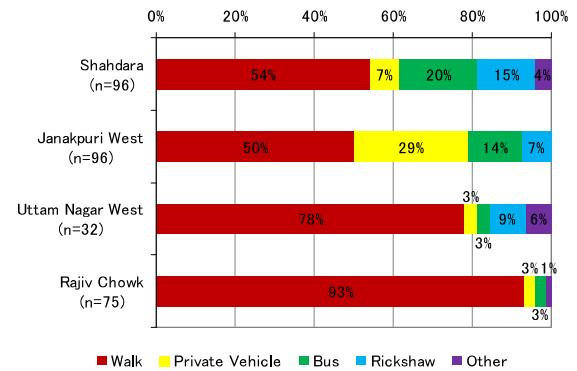
(1) Access Modes

Metro users’ access mode to the stations was analyzed by distance from the station. Among suburban residents, while larger shares of access modes other than walk (i.e., private vehicles and buses) are observed in Metro users living over 1 km from the station, walk still takes around 50%. As described earlier, this may be because a considerable number of Metro users have no other option than to walk to the station under the current conditions.



Metro Users’ Access Mode to Stations (by Distance)

Meanwhile, Metro users’ access mode varies in each representative station of which conditions are different in terms of availability of station plazas, feeder buses, DTC buses, car parks, and so on. However, walk takes at least 50% at all the stations. At Rajiv Chowk Station, in particular, walk takes the overwhelming majority. In the suburbs, access by bus or rickshaw takes relatively larger shares at Shahdara Station, which has a variety of access transport modes as well as a station plaza. On the other hand, access by walking takes nearly 80% at Uttam Nagar West Station, where few access modes are available.



Metro Users’ Access Mode to Stations (by Station)

(2) Users’ Satisfactory Levels

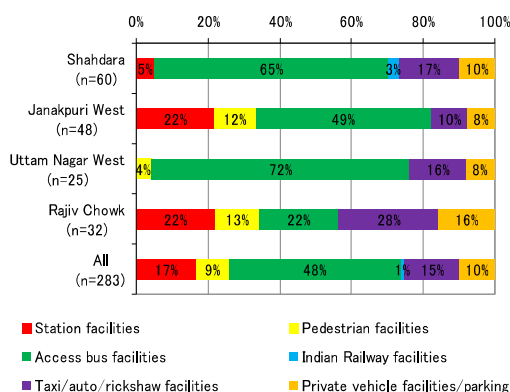
In terms of Metro users’ satisfaction level of intermodal transfer functions at the station, more than half of them are dissatisfied with some intermodal transfer functions of their suburban station except for Rajiv Chowk Station in CBD, which is accessed by walk in most cases. The share of dissatisfaction is the largest at Uttam Nagar West Station, in which few access modes are available.

Furthermore, which facilities/services Metro users are dissatisfied with was asked. Though the result varies by station, dissatisfactions with bus facilities/services take the largest share in the suburban stations. Those who use DTC bus or DMRC feeder bus as an access mode to the station take less than 20%; however, dissatisfactions with bus facilities/services take much larger share. It implies that, since bus services are not available to some Metro users at present, they have to take other access modes such as walk.

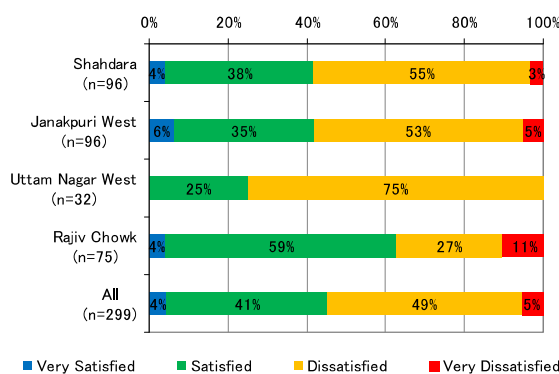
With respect to bus facilities/services, station facilities, and taxi/auto rickshaw/rickshaw facilities with which Metro users are most dissatisfied, their improvement needs were aggregated. Thus, requests regarding improvement of bus services take the majority. For station facilities, additional escalators/lifts, additional waiting facilities such as benches, and additional services to reduce the queues for ticket purchase and security check are needed. As for taxi/ auto rickshaw/rickshaw facilities, requests for more rickshaw space take the largest share. It may imply that the respondents request for improvement of traffic congestion caused by rickshaws waiting at the roadside due to the lack of a station square.

(3) Identification of Issues of Each Representative Station

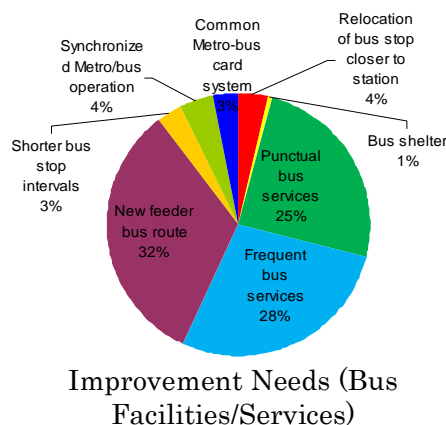
Shahdara Station: Improvement needs of bus facilities/services take more than half of the total improvement needs for both Metro users and non-Metro users at Shahdara Station. Major improvement needs are related to improvement of bus services such as new feeder bus routes, more frequent bus services, and punctual bus services. Meanwhile, requests that are related to further enhancement of the convenience are more remarkable including shorter bus stop intervals, construction of bus shelters (including waiting facilities and information boards), introduction of a common Metro-bus card system, and synchronized Metro-bus operation.



Facilities/Services that Metro Users are Dissatisfied with



Metro Users' Satisfaction of Intermodal Functions Level



Improvement Needs (Bus Facilities/Services)

Janakpuri West Station: Janakpuri West Station is a medium-scale station with feeder bus services as well as parking facilities. However, the station has no station plaza, and hence it is considered that facilities/services of each access transport mode need to be improved. The majority of requests made by Metro users are related to bus facilities/services such as new feeder bus routes, increase in service frequency, and improvement in punctuality. On the other hand, improvement needs about private vehicle facilities/parking are relatively large especially among non-Metro users. In fact, it is larger than the share of bus facilities/services. As for access mode shares of Metro users, private vehicle take about 30% which is larger than the other stations. Major requests for improvement include expansion of the car and motorcycle parks, provision of pick-up/drop-off space, parking restriction against non-Metro users, and so on.

Uttam Nagar West Station: Uttam Nagar West Station has no station plaza. Feeder bus services and parking facilities are also non-existent; thus, 80% of Metro users access the station by walking and the remaining are likely to use rickshaws. Available services and facilities for access transport are thus limited. Therefore, the share of Metro users who are dissatisfied with intermodal transfer functions is the largest of the four representative stations. About reasons why non-Metro users do not use Metro, while the major reasons is that the total cost including the Metro fare is higher than that of the current travel mode at the other three stations, what the non-Metro users pointed out most regarding Uttam Nagar West Station is dissatisfaction with intermodal transfer functions such as inconvenience of transfers and insufficient access transport means.

Rajiv Chowk Station: Although Rajiv Chowk Station, which is a representative station in CBD, has no station plaza, the Metro users' level of satisfaction in terms of intermodal transfer functions is relatively higher compared to the suburban representative stations. The number of passengers who use this station is very large, and walk is the dominant access mode with a 90% share. Meanwhile, there are a variety of access modes, and the questionnaire survey revealed complaints about those facilities/services. Thus, intermodal transfer functions need to be enhanced.

3 .Improvement Measurements by Station Type

3.1 Current Issues on Existing Intermodal Transfer Facilities at Delhi Metro Stations

Based on the Interview Survey and the site reconnaissance survey, overall issues hold by the Delhi Metro are summarized as shown in Figure 3.1 and Table 3.1. The development issues are categorizes into five (5) groups of facilities, that is, 1) Station function related; 2) Pedestrian-related; 3) Feeder bus service connection related; 4) Taxi & para-transit related; and 5) Private transportation related.

Figure 3.1 Overall Issues for Intermodal Facilities Improvement of Delhi Metro

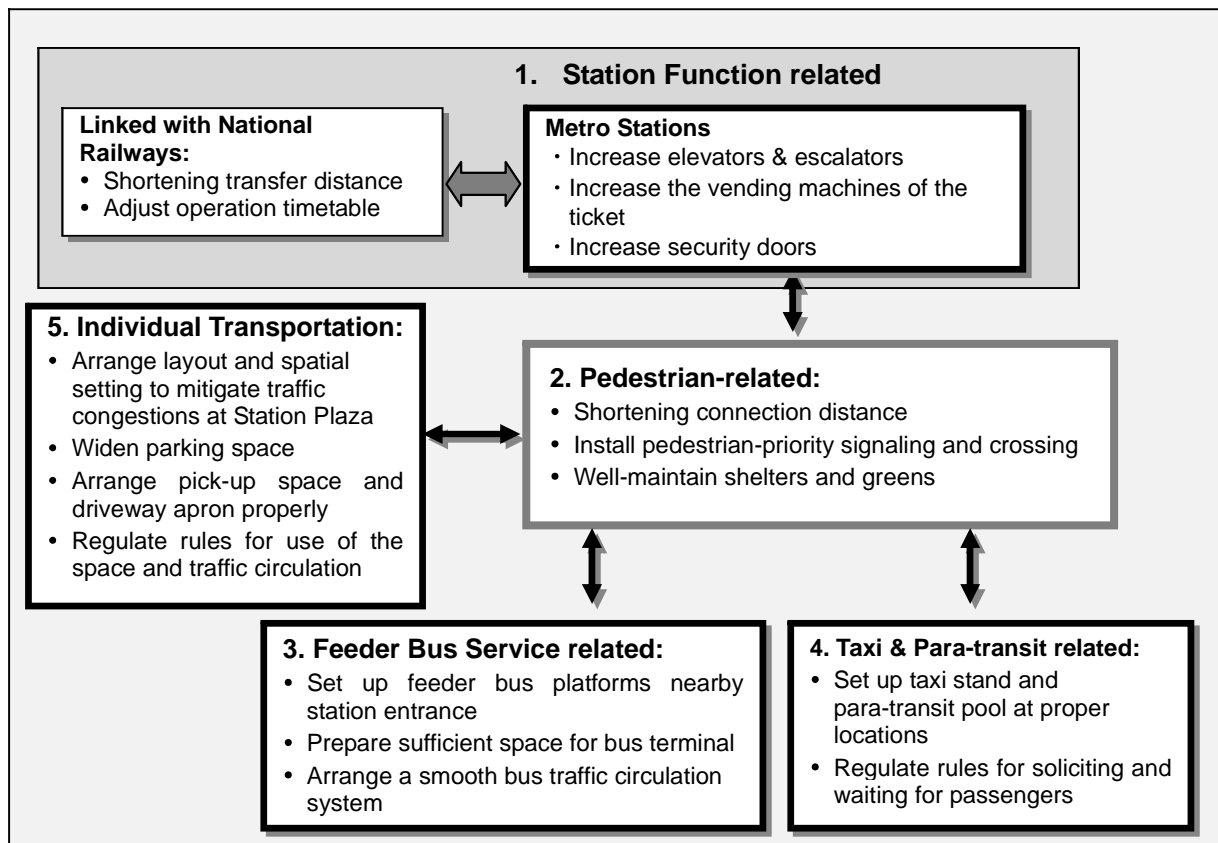


Table 3.1 Summary of Identified Issues on Intermodal Functions at Four Representative Stations

Item	Shahdara Station	Janakpuri West Station	Uttam Nagar West Station	Rajiv Chowk Station
Outline	<p>It is a representative station of Category 1 with a station plaza and connections with various transfer modes. A supplemental was also conducted by directly interviewing Metro passengers transferring to/from Indian Railways and other access transport modes.</p>	<p>It is a representative station of Category 2. Though it is a medium-scale station with feeder bus services as well as parking facilities, it has no station plaza and hence it is considered that facilities/services of each access transport mode need to be improved.</p>	<p>It is a representative station of Category 3. It has no station plaza, and feeder bus services and parking facilities are also non-existent; thus, 80% of Metro users access the station by walk and the remaining are likely to use rickshaws. Non-Metro users also pointed out dissatisfaction with intermodal transfer functions rather than travel cost.</p>	<p>It is a representative station in CBD. Metro users' satisfaction level in terms of intermodal functions is relatively higher. The number of passengers who use this station is very large, and walk is the dominant access mode with a 90% share. There are also a variety of access modes, and intermodal functions need to be enhanced.</p>
Station Facilities		<p>The share of those who are dissatisfied with station and pedestrian facilities is greater than that of other stations. There are requests for additional security check lines, automatic ticket vendors, and waiting facilities such as benches.</p>		<p>Since many passengers concentrate at this station, there are relatively more requests for additional security check and ticket vending facilities and equipments to reduce the queue of passengers. As the platforms and trains are always crowded with passengers, alleviation of congestion is also requested.</p>
Pedestrian Facilities	<p>There are requests for installation of roofs (including green shelters), moving walkways for pedestrian passages to be used for transfers, etc., partly because walking distance between the station and the access modes tends to be long. Over half of requests of pedestrian facilities made by Metro users transferring to/from DTC bus are especially concentrated on safe pedestrian crossing facilities.</p>	<p>While the station has an elevated structure over the trunk road, there is no passage available through the station. Thus, there are requests for pedestrian facilities.</p>		

(cont d)

Item	Shahdara Station	Janakpuri West Station	Uttam Nagar West Station	Rajiv Chowk Station
<p>Bus Facilities/ Services</p>	<p>Improvement needs of bus facilities/services take over half of the total improvement needs for both Metro users and non-Metro users. Major improvement need is for bus services such as new feeder bus routes, and more frequent and punctual bus services. Requests that are related to further enhancement of the convenience are remarkable including shorter bus stop intervals, construction of bus shelters (including waiting facilities and information boards), introduction of a common Metro-bus card system, and synchronized Metro-bus operation.</p>	<p>The majority of requests made by Metro users are related to bus facilities/services such as new feeder bus routes, increase in service frequency, and improvement in punctuality.</p>	<p>The share of complaints about bus facilities/services is overwhelmingly large among both Metro users and non-Metro users. Though new (feeder) bus services are requested as an access mode to the station, the roads are currently not wide enough for buses to pass through the urban areas around the station.</p>	<p>The share of complaints about bus facilities/services is relatively small as compared to the suburban stations. In addition to the basic improvement needs for new feeder bus routes, more frequent bus services, and punctual bus services, accessibility between the station and the bus terminals located outside the ring road is an issue which is also related to pedestrian facilities.</p>
<p>Taxi/ Auto Rickshaw/ Rickshaw Facilities</p>	<p>Metro users request more space for an auto rickshaw/rickshaw stand.</p>		<p>Metro users request more pick-up/drop-off space of rickshaws that are virtually the only access transport mode available.</p>	<p>Taxis and auto rickshaws are often used as an access mode. Improvement needs for taxis and auto rickshaws take the largest share among Metro users, including providing taxi bays, securing space for pick-up/ drop-off, etc.</p>
<p>Private Vehicle Facilities/ Parking</p>	<p>Many non-Metro users request more private vehicle facilities/parking. While motorcycle park & ride users often request expansion of motorcycle parks, car parks, and bicycle parks, car park & ride users request expansion of car parks only. There are also significant shares of requests for parking restriction against non-Metro users, pick-up/drop-off space for private vehicles, closer connection between parking facilities and the station.</p>	<p>As for access mode shares of Metro users, private vehicle take about 30% which is larger than the other stations. Improvement needs about private vehicle facilities/parking are relatively large especially among non-Metro users. Major requests for improvement include expansion of the car and motorcycle parks, provision of pick-up/drop-off space, parking restriction against non-Metro users, etc.</p>	<p>From both Metro users and non-Metro users, there are improvement needs about private vehicle facilities/parking including provision of car and motorcycle parks as well as pick-up/ drop-off space in front of the station.</p>	

Source: JICA Study Team