

Overview and significance of assistance in the field of urban transportation with a focus on the cases in India and Bangladesh



21st September, 2023

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Today's Agenda

1. JICA's cooperation in South Asian Countries

南アジアにおけるJICAの協力について

2. Kolkata Metro (India)

コルカタメトロ

3. Delhi Metro (India)

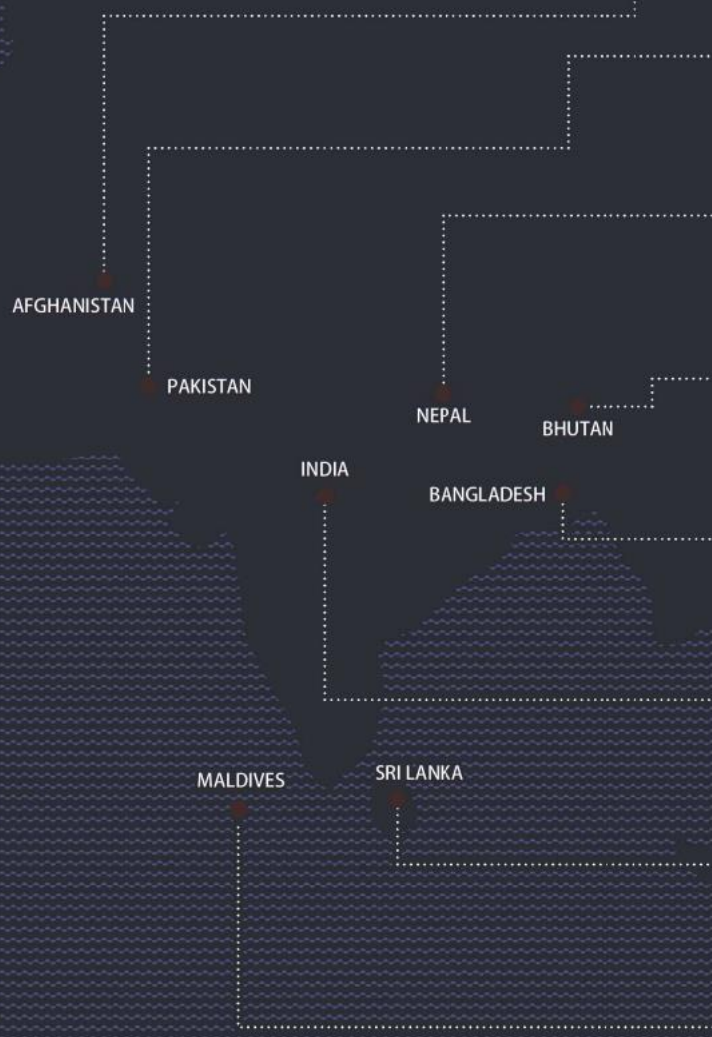
デリーメトロ

4. Dhaka Metro (Bangladesh)

ダッカメトロ

JICA in South Asia

JICA has been cooperating in a variety of fields.
This document introduces some of the results of the cooperation.



AFGHANISTAN

10,000ha
Expansion of more than 10,000 ha of irrigation area

PAKISTAN

200,000 people
Provision of about 200,000 non-formal educational opportunities since 2014

20M vaccines
Provision of nearly 20 million polio vaccines each year since 1996

6M people
Supply of safe water to more than 6 million people

NEPAL

160km
Construction of the vital 160 km Sindhuli Road to support the Nepal economy

11,735 class rooms
Reconstruction and earthquake-proofing of 5,521 schools and 11,735 classrooms

51%
Supplying 51% safe water of Kathmandu's maximum demand

BHUTAN

22,026 HH
Electrification of 22,026 households in mountainous areas where construction is difficult

1,620 HH
Provision of agricultural equipment benefiting 1,620 households from cultivation in 2022

BANGLADESH

36h → 15min
Construction of the Jamuna Bridge, reducing travel time, including ferry waiting time, from 36 hours to 15 minutes

39M students
Revision and distribution of textbooks for about 39 million students in 60,000 schools

417 clinics
Establishment of 417 community health clinics benefiting 2.5 million people

44% → 80%
Improvement of waste collection rate in Dhaka from 44% to 80%

INDIA

7.8GW
Generation of 7.8 GW of renewable energy (about 5% of renewable energy in India)

400km
Development of about 400 km of total metro length (about double the Tokyo Metro)

2Mha
Afforestation of 2 million ha (about 10 times the area of Tokyo)

15.87M people
Construction of sewage treatment facilities to benefit more than 15.87 million people

SRI LANKA

12%
Development of 12% of Sri Lanka's power supply capacity

32%
Construction of 32% of the total length of national expressways

3.5M people
Supply of safe water to more than 3.5 million people (15% of the population)

MALDIVES

5km
Development of about 5 km of seawall surrounding Mae' Island (At the time of the 2004 Sumatra earthquake, 2/3 of the capital was flooded but there were no fatalities)



Kolkata Metro (コルカタメトロ)

The first Metro Project in India

Introduction to Kolkata Metro Project

Kolkata Metro was the first Metro Project in India

インドで最初のメトロ事業

The project was initiated by the Soviet Union in 1971. Construction began in 1973 and it took almost 23 years to complete the 17km underground railway.

1971年にソ連のF/Sからスタート。1973年に建設が開始し、完成までに実に23年間の時間を要した。

JICA supported the construction of the technically challenging sections since 1983.

JICAも1983年から本事業の技術的に困難な個所の建設費用の一部を支援。

Result of Kolkata Metro

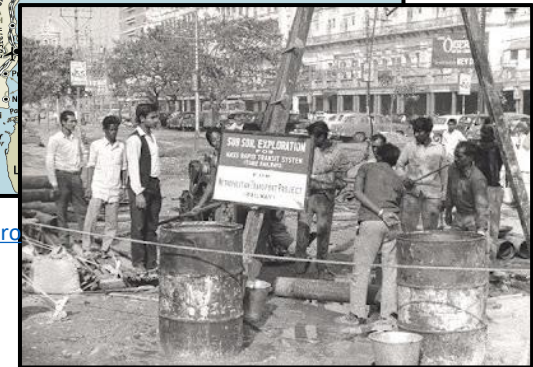
- Due to problems with land acquisition, importing construction machinery, underground structures such as sewers, and construction constraints due to road congestion, etc., construction was significantly delayed 調整不足等による用地取得、建設機械の輸入手続き、下水道等の地下構造物、道路交通渋滞による工事の制約等の問題により、工事は大幅に遅延。

Planning of Delhi Metro

- Because of the bitter experience of Kolkata Metro, many people were skeptical about new metro projects in India.
コルカタメトロの苦い経験もあり、インドでのメトロ事業について多くの人が懐疑的だった。
- However, following Indian cabinet approval of the Delhi Metro Project in 1996, JICA started in-depth study and 1st Loan Agreement was signed in 1997.
しかし1996年インドの閣議にてデリーメトロを承認されたことを受け、JICAは検討を開始、最初の借款契約が1997年に締結。



Photo: [Calcutta \(Kolkata\) Metro Rail Construction Old Photo 1971 - Old Indian Photos](#)



Delhi Metro(デリーメトロ)

Why Delhi Metro was needed?



Traffic

交通量の多さ

- Delhi's population has grown from 9.4 million in 1994 to around 16 million today, causing severe traffic problems.

デリーの人口は1994年の約940万人から現在の約1600万人にまで増加。



Air Pollution

大気汚染

- In 2022, Delhi was ranked the most polluted city in the world by the UN Environment Program.

国連環境計画（2022年）によれば、デリーは最も大気汚染が深刻な都市となっている。



Lack of transportation option

交通手段の少なさ

- In Delhi there was a lack of transportation option which was reliable, cheap and safe for woman and people with disability.

障がい者、女性が安心して移動する交通手段が整備されていない。

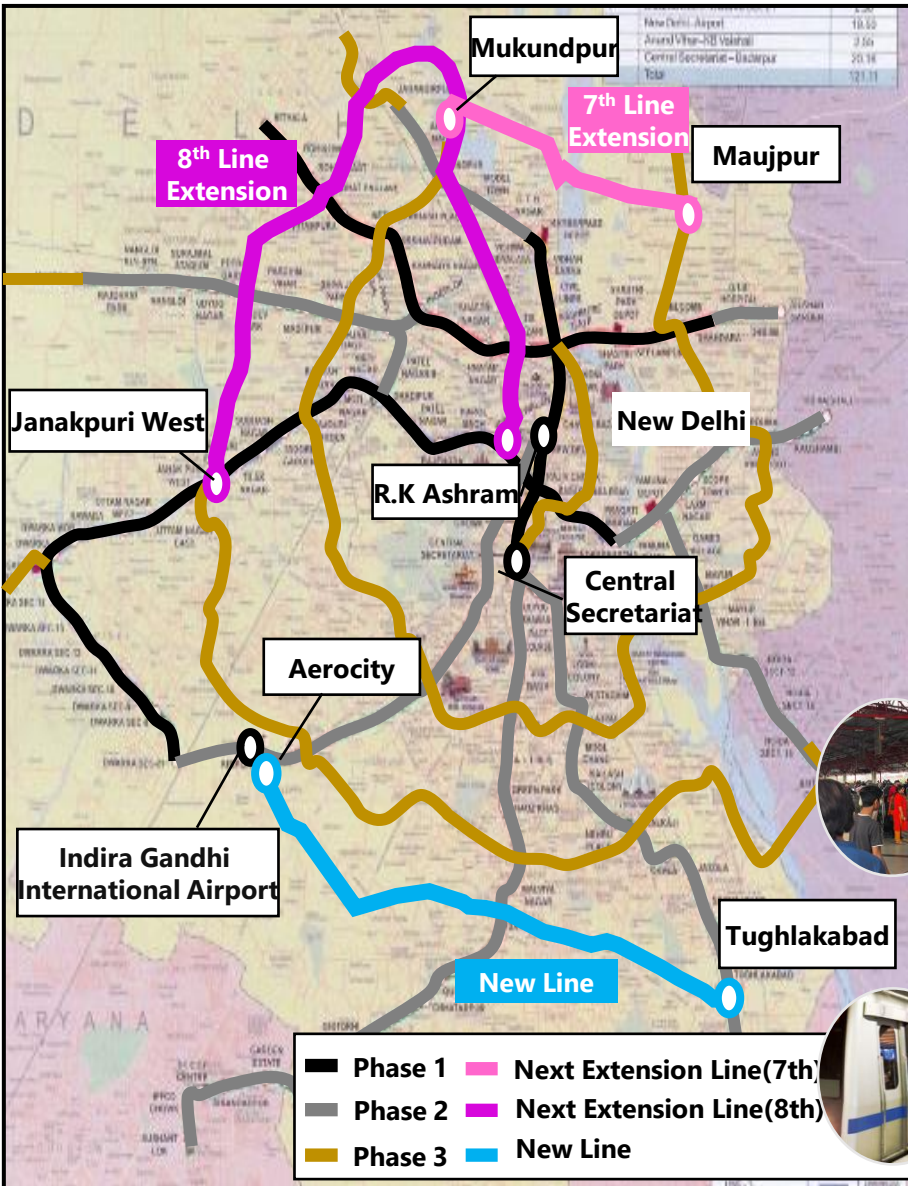


To address this dire situation, India and Japan planned a metro system in Delhi.

Delhi Metro(デリー)

Introduction to Delhi Metro

Map of Delhi Metro Line



Phase 1

- L/A: Feb/1997
- Construction finish: Nov/2006
- Total loan: JPY 163 bil
- Length: 58.6km
- 総借款額：1,628億円

Phase 2

- LA: Mar/2006
- Construction finish: Aug/2011
- Total loan: JPY 212 bil
- Length: 83km
- 総借款額：2,120億円

Phase 3

- L/A: Mar/2012
- Construction finish: Dec/2020
- Total loan: JPY 331 bil
- Length: 115.84 km
- 借款額：3,305億円

Number of passengers per day:

- Delhi Metro: Approx. 5 million
- Tokyo Metro Approx. 4.98 million

Network's total length:

- Delhi Metro: Approx. 390 km
- Tokyo Metro: Approx. 195 km
- ※Including Toei subway: Approx. 300 km

Phase 4

- L/A: Mar/2021
- Under Construction (Purple, Pink and Blue line)
- Total Loan: JPY 119 bil (Tranche 1)
- Length: 65km
- 借款額：1199.78億円 (第一期)



Delhi Metro(デリー)

Features of Delhi Metro(デリーメトロの特徴)

Contribution to Environment 環境への貢献



Reduce Traffic Congestion 交通渋滞の緩和

Giving people a reliable, cheap and safe option to travel around Delhi

デリーで安価、安全で信用の出来る移動方法を提供することにより、地下鉄の乗車数が増え、地上の渋滞が緩和。



Tackle against Air Pollution 大気汚染の低減

Reducing pollutant emissions by 600,000 ton/year

年間60万トンもの汚染物質の削減



Using Clean Development Mechanism (CDM) CDMの利用

First Railway Project in the world to be registered by the United Nations (UN) under the Clean Development Mechanism (CDM) which will enable it to claim carbon credits

UNに鉄道事業として世界で初めてCDMに選ばれた

Delhi Metro(デリー)

Features of Delhi Metro(デリーメトロの特徴)

Change in action 行動変容



Gender Equality & Woman's Empower

ジェンダー平等と 女性のエンパワーメント

1. woman's only cargo
女性専用車
2. woman's safety
i.e., safety cameras and
emergency buzzers
監視カメラや緊急ボタン等安全に考慮
3. Hiring woman
・ environment suitable for
working woman
女性でも働きやすい職場づくり



Construction Safety 工事現場での安全対策

Establishing the concepts of
'safety' and 'delivery time'
現場での「安全」や「工期」の意識



Having people wait in lines in order to ride the train 乗車する際に列に並ぶよう指導

Have people wait in line instead
of rushing in, in order to ensure
safety while getting in & out
電車に乗降するときに、安全を確保する
ため整列



Contribution to promote "high-quality infrastructure"



Maximizing the positive impact of infrastructure to achieve sustainable growth
持続可能な成長と開発へのインパクトの最大化



Raising Economic Efficiency in View of Life-Cycle Cost
ライフサイクルコストから見た経済性



Integrating Environmental Considerations in Infrastructure Investments sustainability
環境への配慮



Building Resilience against Natural Disasters and Other Risks
自然災害等のリスクに対する強じん性



Integrating Social Considerations in Infrastructure Investment
社会への配慮（利用の開放性を含む）



Strengthening Infrastructure Governance
インフラ・ガバナンスの強化（調達の開放性・透明性、債務持続可能性等）

DPR/FEASIBILITY REPORTS FOR METRO/MONO/LRT LOCATED AT 25 INDIAN CITIES



- Expansion of Metro in India -
List of Indian Cities where DMRC provided some form of consultancy services for Mass Transit Projects

—インドにおけるメトロの展開—

デリーメトロ公社がインド国内のみならず海外のメトロ事業にもコンサルタントとして貢献！

- | | |
|---------------|------------------------|
| 1. Ludhiana | 15. Ahmedabad |
| 2. Amritsar | 16. Nagpur |
| 3. Chandigarh | 17. Raipur |
| 4. Dehradun | 18. Kolkata |
| 5. Rishikesh | 19. Mumbai |
| 6. Haridwar | 20. Navi Mumbai |
| 7. Patna | 21. Pune |
| 8. Noida | 22. Hyderabad |
| 9. Gurugram | 23. Vijayawada |
| 10. Jaipur | 24. Vishakhapatnam |
| 11. Lucknow | 25. Bengaluru |
| 12. Bhopal | 26. Chennai |
| 13. Indore | 27. Kozhikode |
| 14. Surat | 28. Kochi |
| | 29. Thiruvananthapuram |

Source: DMRC

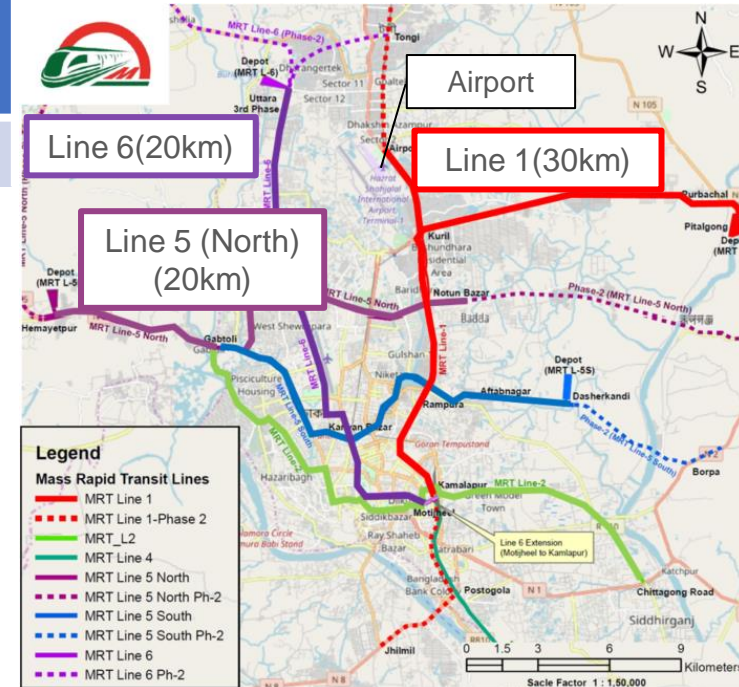
Dhaka Metro(ダッカメトロ)

First metro line opened in 2022, 50th anniversary of Bangladesh-Japan diplomatic relationship
2022年12月、バングラデシュ初の都市鉄道が開業

JICA's comprehensive cooperation for Dhaka metro (法整備支援から資金供与、TODまで包括支援)

1. Technical assistance (技術協力)

- **Cooperation to develop master plan and legal framework**
 - ✓ 【completed:2009~2011】“Dhaka Urban Transport Network Development Study”(最初のダッカMRT支援)
 - ✓ 【completed】Formulation of “Revised Strategic Transport Plan”(MRTを主軸とするマスタープランを提案)
 - ✓ 【completed】Preparation of rules and regulations for MRT (都市鉄道を担う組織の構築、関係の法律や技術的な基準策定)
- **Cooperation for railway operation and urban development**
 - ✓ 【completed】Establishment of safety management system (安全運行のための組織・ルールづくり)
 - ✓ 【on-going】Establishment of clearing house for integrating transport ticketing system (交通ICカードによる料金徴収実現のためのシステム構築)
 - ✓ 【on-going】Preparation and implementation of TOD(公共交通指向型開発に向けた、駅周辺のまちづくりのガイドライン作成)



2. Finance for construction of MRT(円借款)

- MRT Line 6: First urban railway (partially opened in Dec. 2022)
- MRT Line 1: First underground metro (planned to open in 2028)
- MRT Line 5 (North): Connecting East and West (planned to open in 2029)

Dhaka Metro(ダッカメトロ)

Utilizing Japanese technology
for safer and energy-efficient operation



- **STRASYA** (STandard urban RAilway SYstem for Asia), an urban railway system developed by Japanese railway companies and government is adopted.
 - Safer and more energy-efficient
 - Punctual and stable operation
 - Less need for frequent maintenance
- 車両は日本の通勤車両と同じSTRASYAを導入。衝突を前提としない軽量車体で省エネルギー・省メンテナンスを実現

Dhaka Metro(ダッカメトロ)

Promoting social inclusion
多様な人々の社会進出を促進

First female train operators
(バングラデシュ初の女性運転士が誕生)



Wheelchair space/ women-only car
(車椅子スペース・女性専用車を設置)



Facility for handicapped person
(車椅子対応の窓口・点字ブロック)



Restroom for a person with child
(トイレ内のオムツ替え台)



Safe escalator for women /child
(サリーガード・水平な乗り口)



Reference

デリー高速輸送システム建設事業(デリーメトロ事業)は、インドの首都デリーの交通渋滞を緩和するため、1996年より開始され、今でも路線網を拡大しつつある。本事業のフェーズ1では市内路線の計65kmが建設された。大規模インフラの建設は遅延することの多いイン

- JICA カルカッタ地下鉄事業: [project_134_smry.pdf \(jica.go.jp\)](#)
- JICA Press Release: [JICA and DMRC complete 20 years of successful economic partnership of Delhi Metro project | India | Countries & Regions | JICA](#)
- Project history cartoon: the struggle of project consultant (Ms Abe of OCG: female engineer, President of OCG, India): [プロジェクト・ヒストリー「漫画版」「マダム、これが俺たちのメトロだ！インドで地下鉄整備に挑む女性土木技術者の奮闘記」 | 広報誌・パンフレット・マンガ・カレンダー・ラジオ | JICAについて - JICA](#)
- Award by the Ministry of Public Works: [土木学会技術賞\(Ⅱ\) 3案件受賞「インド国デリーメトロ都市鉄道建設プロジェクト\(フェーズ1/2/3\)」 「アンゴラ国 ナミベ港改修計画」 カチプール・メグナ・グムティ新橋建設及び旧橋改修工事 - オリエンタルコンサルタンツグローバル \(ocglobal.jp\)](#)
- JICA research analysis paper (project ethnography) [Delhi Metro Story - 'Breaking Ground' Author's perspective: analysis ja_02.pdf \(jica.go.jp\)](#)
- YouTube, Video of Delhi Metro(200k views) Japanese Version: [【運輸交通】デリーメトロが人々の生活を変える - JICAが協力するデリーメトロ整備 - \(フルver.\) - YouTube](#)
English Version - [【Transportation】 Changing People's Lives with the Delhi Metro: 【Transportation】 Changing People's Lives with the Delhi Metro - YouTube](#)
- YouTube, Video of Dhaka Metro - [【Transportation】 Changing People's Lives with the Delhi Metro 【Transportation】 Changing People's Lives with the Delhi Metro - YouTube](#)

197K views 11 months ago

JICAが長年にわたり協力を行い、シャイニング・イグザンプルとも呼ばれるデリーメトロ(デリー高速輸送システム建設事業)について、日本の協力によって推進した、①安全管理・工期遵守、②整列乗車・定時運行、③女性専用車両・障害者配慮、④環境負荷軽減、などの社会インパクトをDMRC(デリーメトロ公社)及びJICAの関係者のインタビューを交えながら紹介するもの。...more