

JICA's Cooperation on Railway O&M

For Sustainable and Green Transportation





Speaker

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Today's agenda

- JICA's various assistance for O&M development
- Comprehensive understanding and well-organized plan for O&M development
- Harmonization with construction timeline

Issues on urban area and transportation

- Rapidly growing urban population and traffic congestion in megacities
 - High energy consumption in urban area
 - High capacity and energy efficient railway system is appreciated in urban area
 - Safe and reliable railway for further modal shift
- Zero accident and punctual operation

JICA's Approach to Urban Railway Projects

Yen Loan

- Construction of new lines
- O&M (Rehabilitation and maintenance, etc.)
- Technical transfer by consultants and contractors



Technical Cooperation

- Policy/ Regulation
- Finance scheme
- Organizational structure
- Human resource development
- Others

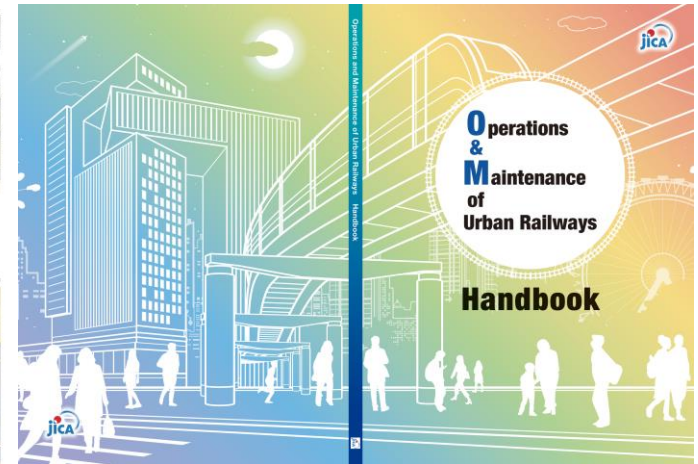


CREATING A BETTER OPERATIONS AND MAINTENANCE SYSTEM FOR URBAN RAILWAYS



Dissemination of JICA's Experience

- Seminar
- **O&M Handbook/Brochure**

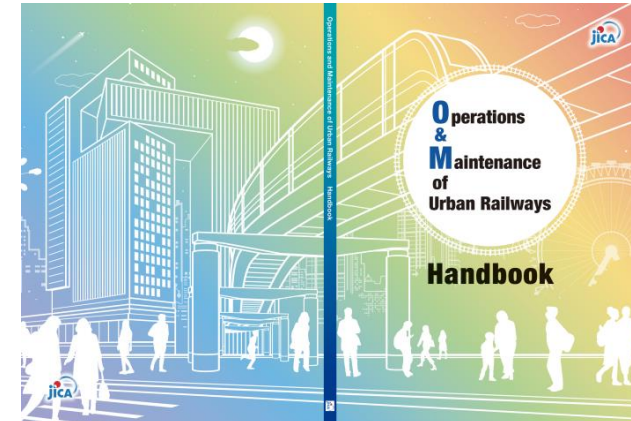


From JICA's O&M Handbook and Brochure

- Comprehensive understanding on O&M development
Basic knowledge/O&M Case Studies/Past Projects/Future Projects
- Well-organized understanding and planning for O&M
- O&M activities on appropriate timings on each stage of projects
(MP/FS/Designing/Construction) and harmonization with
construction timeline

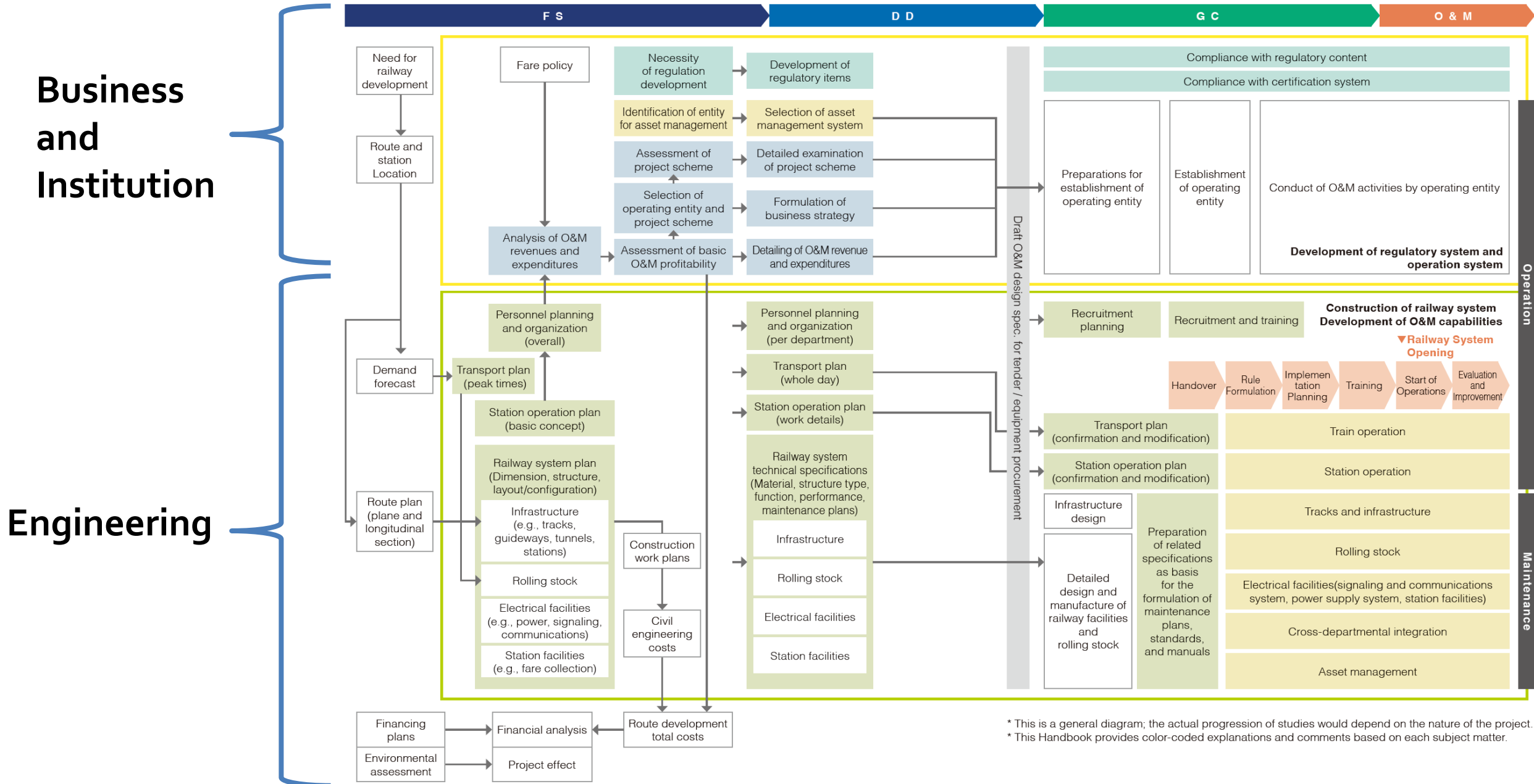


CREATING A BETTER
OPERATIONS AND MAINTENANCE SYSTEM
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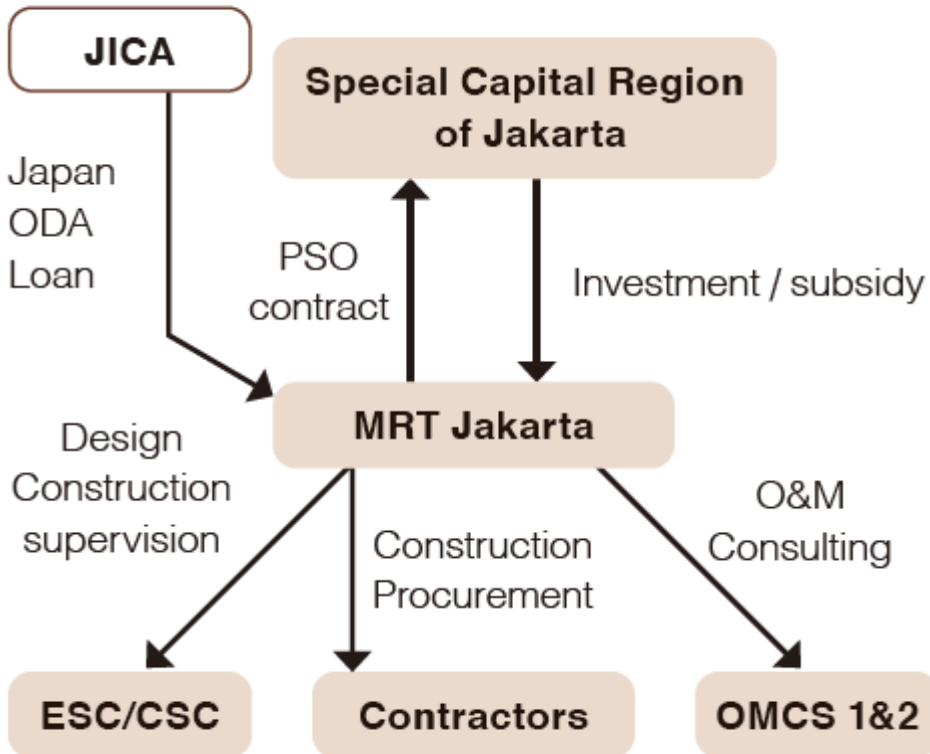
Overview of O&M and O&M elements



* This is a general diagram; the actual progression of studies would depend on the nature of the project.
 * This Handbook provides color-coded explanations and comments based on each subject matter.

O&M Development in MRT Jakarta, Indonesia

▼ Business Scheme Diagram



- MRTJ operates and maintain the railway as the operator
- O&M consulting services (OMCS) under Yen Loan supported organization structuring and personnel planning, etc.
- The organization/personnel are well implemented based on Japanese practice

▼ KPI and Achievement Status (MRTJ, 2019)

Percentage of accuracy of train travel	75 : 99.96 [%]
Percentage of actual number of train trips as planned	75 : 99.98 [%]
Public Readiness Index	70 : 72.9 [%]
Customers Satisfaction Index	75 : 82.78 [%]
Non-Farebox Revenues (Related business)	100 : 220.22 [%]
Good Corporate Governance Score	87 : 87.33 [%]

O&M Development in MRT Jakarta in Indonesia



Legend

Japan ODA Loan Project

Feasibility study

Project validity
Project plan
Project implementation plan

1

Work processes

Organizational Framework
Governance

2009

2012 2013

FS

DD

Planning

Design

1

MCS

CMCS

Safety supervision

Study and dissemination of technologies for safety measures at construction sites

2016

2016

Construction

2

Personnel training

O&M personnel training

2019

2

Preparation of rules and manuals

Preparation of rules and regulations, and manuals

2

Organization establishment and recruitment

Establishment of organization and recruitment support

2

O&M support

Post-opening support

3

Continuous O&M support

2020

GC

O&M

Handover

Operation

Evaluation/Improvement

Operational Readiness

2

OMCS

3

OMCS 2nd



O&M Development Process

Regulatory Supervision System (Development of laws)
→ Examples of support on p. 7, 12

- Development of legal systems (e.g., project approval, safety management, technical standards)

Regulatory Supervision System (Operations) → Examples of support on p. 9

- Approval of construction
- Safety certification
- Approval of railway business
- Opening audits
- Safety audits
- Accident reports, etc.

Business Schemes

- Cost estimation for construction and O&M
- Selection of operating entity (publicly or privately operated)

Establishment of Operating Organization
→ Examples of support on p. 8

- Establishment of preparation team
- Establishment of operating entity
- Recruitment of human resources

Establishment of O&M Framework
→ Examples of support on p. 9,10

- Framework-building for technical departments
- Regulations and manuals in the entity
- Training for O&M personnel

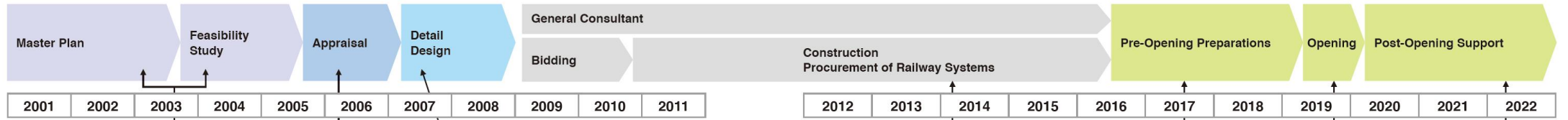
Enhancement of skills and facilities
→ Examples of support on p. 11, 12

- Continuous improvement in operational capability

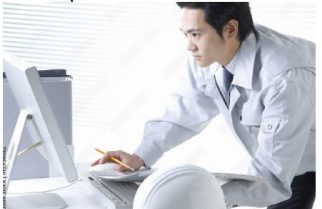
Railway System

- Train operation planning
- Railway facilities planning
- Personnel planning
- Detailed review of railway facilities
- Bidding preparations
- Verification of progress in construction work
- Facilities verification by operating entity

Project flow



Example of Jakarta MRT in Indonesia



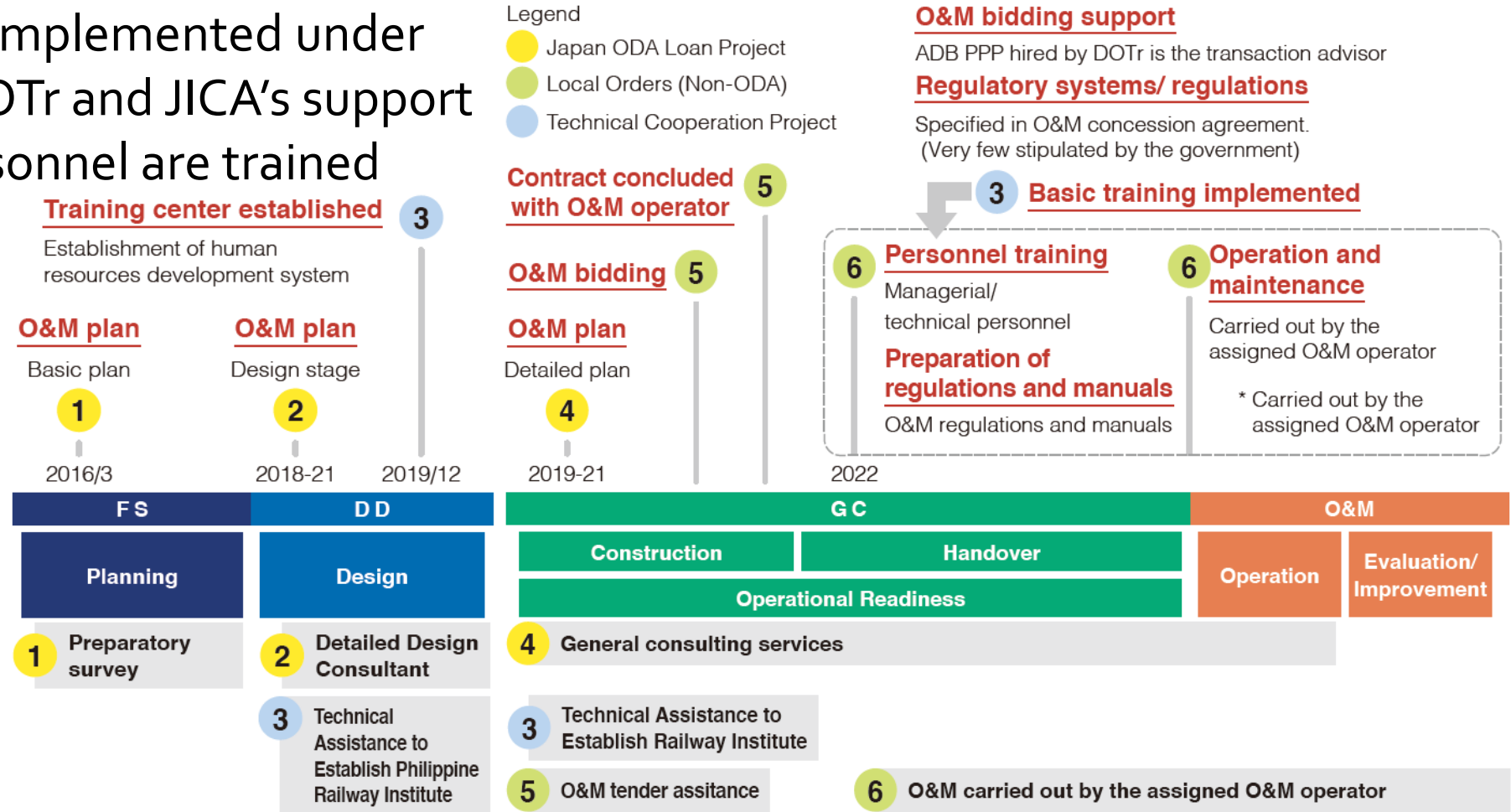


O&M Development in Railways in Manila, Philippines

- Training institute of Philippines' railway
- Organization establishment and railway personnel training are implemented under strong leadership of DOTr and JICA's support
- Over 2,700 railway personnel are trained



Philippine Railway Institute (Under construction)



For well-organized O&M planning

- O&M checklist for comprehensive O&M development plan
- Appropriate share of the roles among entities, consultants and contractors

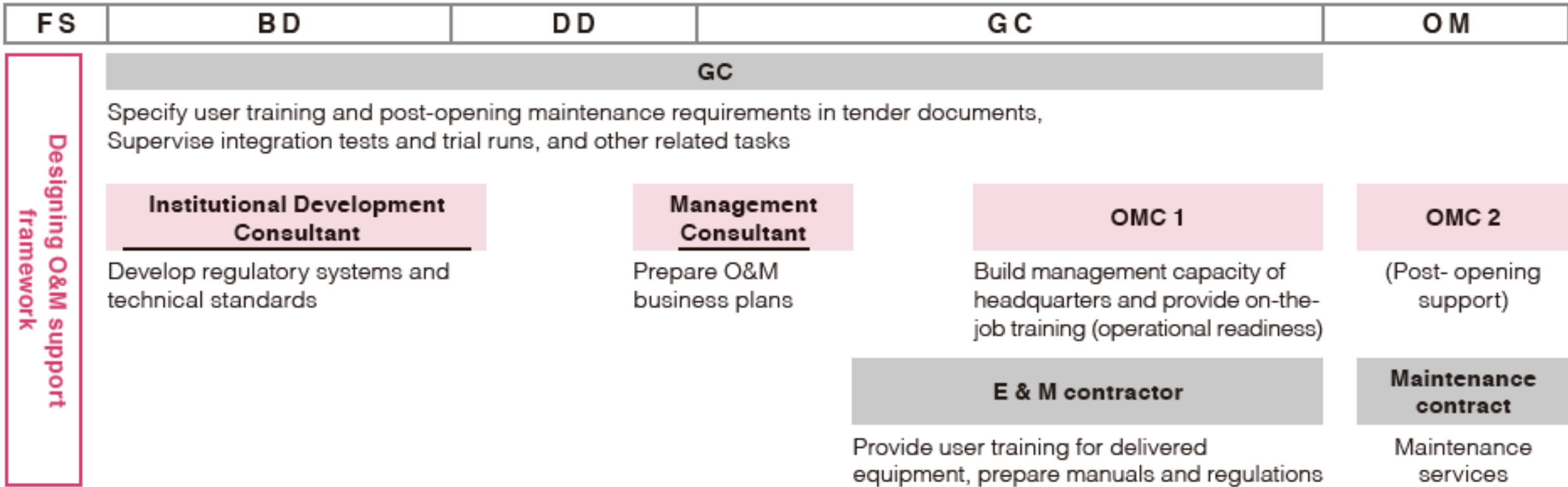
O&M Plan	Personnel and Organizational Plan	Business Plan	Economic and Financial Analysis	Regulatory System	Contract	Organizational Development and Recruitment	Operational Readiness							Post-Opening Support			Training Center																																											
						Organizational development	Recruitment plan	Hiring of admin. and management personnel	Hiring of O&M personnel	Training of train drivers	Visits and technology transfer	Facility documentation(as-built drawings)	Facility handover	Training and readiness (Admin./Management)	Training and readiness (Operations)	Training and readiness (Maintenance)	Internal rules and regulations	Job manuals	Quality management plan	Maintenance plan and budgeting	Equipment procurement	Asset and resource management system	Practical training	Integrated testing and trial run	Operating license	Organizational management	Maintenance activities	Operations activities	Organizational improvement	Maintenance improvement	Operations improvement	Organizational and institutional development	Training center management	Training materials development	Training equipment procurement																									
Demand Forecast	Route plan	Transport plan	Railway system plan	Station operation plan	Maintenance plan	Organizational designs	Personnel plan	Definition/delineation of duties/functions	Asset ownership and management	Project scheme	O&M revenue and expenditure	Selection of operating entity	Fare policy	Non-rail business	PR plan	Business strategy	Service level	Replacement and reinvestment costs	Subsidy	Cash flow analysis	Economic and financial analysis	Regulatory framework	Institutional development	Regulator capacity building	Technical standards	Safety management	Safety certification	Other rules and regulations	O&M contract	Outsourcing plan	Organizational development	Recruitment plan	Hiring of admin. and management personnel	Hiring of O&M personnel	Training of train drivers	Visits and technology transfer	Facility documentation(as-built drawings)	Facility handover	Training and readiness (Admin./Management)	Training and readiness (Operations)	Training and readiness (Maintenance)	Internal rules and regulations	Job manuals	Quality management plan	Maintenance plan and budgeting	Equipment procurement	Asset and resource management system	Practical training	Integrated testing and trial run	Operating license	Organizational management	Maintenance activities	Operations activities	Organizational improvement	Maintenance improvement	Operations improvement	Organizational and institutional development	Training center management	Training materials development	Training equipment procurement

For better O&M planning

Consulting package Detailed designs and construction supervision services

▼ **Standard form of O&M support**

Consulting package Operation and maintenance consulting service (underlined are JICA funded.)



Designing O&M support framework

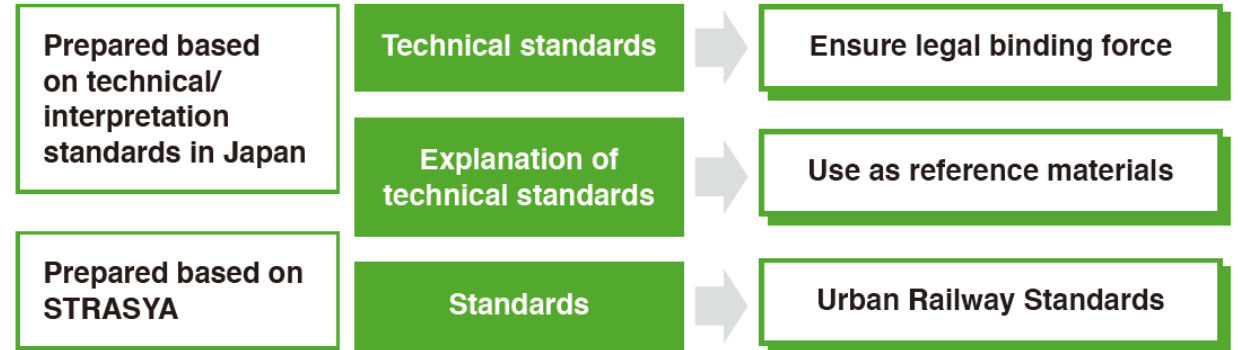
Development on legal system and regulatory bodies

Preparation on rules and regulations under urban mass rapid transit act Bangladesh, 2015)



Cabinet determination of Urban Transportation Law

Study on building the National Technical Regulation and Standard set for railway (Vietnam, 2009)



Project for Capacity Development on Railway Safety (India, 2018)

- Maintenance capacity building on rail/ track/ rolling stock
- Accident investigation



Accident investigation training administered in Japan



Freight transport in India

Summary – for safe and reliable railway O&M

- Comprehensive understanding and well-organized plan for O&M development
- Harmonization with construction timeline
- For more details: **JICA's O&M Handbook and Brochure**

https://www.jica.go.jp/Resource/english/our_work/thematic_issues/transportation/urban_railway_handbook.html

