

The Challenges in Managing the Construction of Line No.9 in Shanghai



Contents

- ◆ Background
- ◆ Project Management Approach
- ◆ Progress Update
- ◆ Challenges and how they are managed
- ◆ Conclusions

Background

Current Status of PRC Metro Development

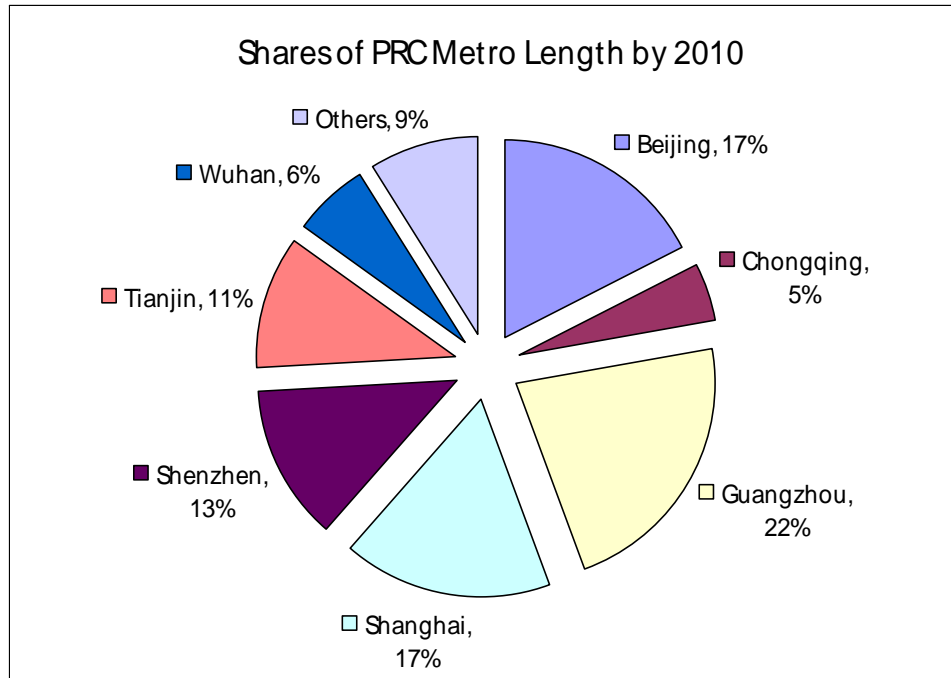
- No of China cities will have metro operation by 2010: 10 (Beijing, Tianjin, Shanghai, Guangzhou, Shenzhen, Nanjing, Wuhan, Chongqing, Shenyang and Chengdu)

Rough Estimate on the scale of metro development in major PRC cities		
Year	Total length of metros in operation , kilometers	Value ^(N1) of investment made, RMB Billion
2006	500	200
By 2010	1,000	400
By 2020	2,000	800

(N1) – Assume an average of RMB 400 million per km for metro investment

Background

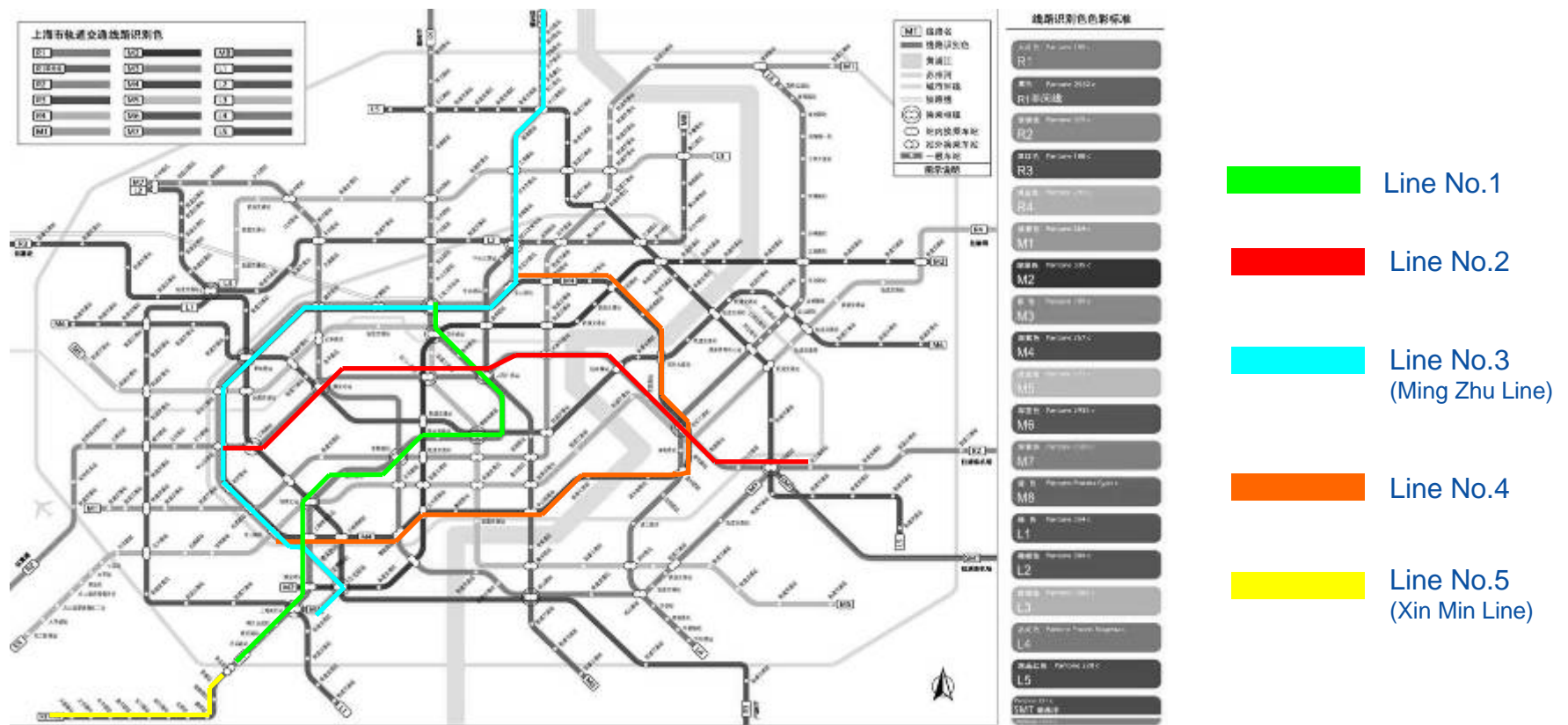
Current Status of PRC Metro Development



- Metro systems in analysis include Light Rail Transit.
- Others are metros in Chengdu, Shenyang and Nanjing.
- Other China cities planning to deliver systems by the next decade: - Hangzhou, Harbin, Suzhou, Changchun, Xi'an, Qingdao, Dalian, Wuhan, etc.

Shanghai's planned railway map in 2020

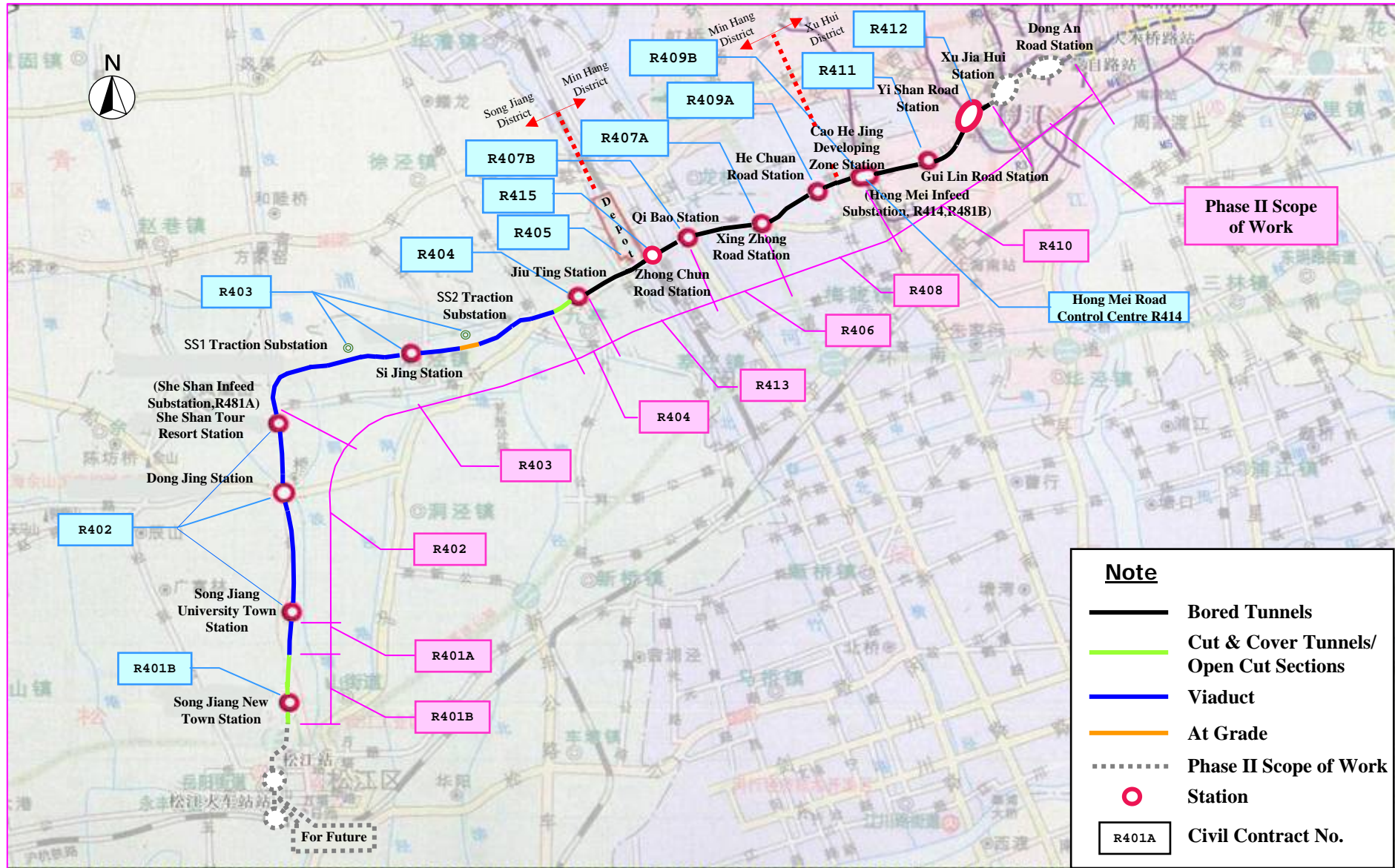
19 lines at around 780km; currently 145km in operation, 155km under construction.



Line No.9 (R4) – Phase I

- ◆ Length: 32km from Song Jiang New Town to Xu Hui District
(60% of the line on bored tunnel while remaining on viaduct)
- ◆ Station: 13 nos.
(4 nos. above ground, 9 nos. underground)
- ◆ Forecast patronage in 2015 is 750,000 per day with a tidal patronage pattern due to the commercial business centers and universities located along the line.

Project Line Diagram



Note	
	Bored Tunnels
	Cut & Cover Tunnels/ Open Cut Sections
	Viaduct
	At Grade
	Phase II Scope of Work
	Station
	Civil Contract No.

Project Management Approach

- ◆ Owner's Representative in line with the guidelines recommended by the Construction Department of the Central Government in Feb 2003.
 - Acting as Project Manager, representing the Owner in managing all project issues with Contractors, Designers and Agents.
 - Acting as Engineer under the FIDIC Form of Contract.
 - Owner has full visibility and retain his position as Owner for the Project.

Project Management Approach

- ◆ Design Philosophy
 - Integrated stations – flexibility for future development / transport interchanges.
 - To obtain Lump Sum Prices.
 - Clear definition of project objectives and client requirements.

Project Management Approach

- ◆ Planning & Programming
 - Two tier programmes
 - Level 1: master programme
 - Level 2: individual Works Programmes with critical dates & milestones identifying the critical path of each Contract.
 - Flexibility in place to secure the completion dates
 - Progress monitoring and Programme Control
 - Track Related Installation Works Programme (TRIP)

Project Management Approach

- ◆ Interface Management
 - Design interfaces; IRS (Interface Requirement Schedules) for inter-disciplinary coordination with contractual obligations.
 - Programme interfaces; schedule of completion date and access dates.
 - Site interfaces; station meetings to ensure parties are coordinating with each other.

Project Management Approach

- ◆ Contract Strategy
 - Adoption of FIDIC Condition of Contract.
 - Cascade on tendering to smooth resource requirements and allow sufficient time for information exchange between Contracts.
 - Civil Contracts: Geographical / Functional split
 - E&M Contracts: system wide approach

Project Management Approach

- ◆ Construction Management
 - Interim payment linked to Milestones achievement to drive the progress of works.
 - Engineer's Representative as focal point of contact on site.
 - Supported by Site Supervision Agent mainly on site matters including quality inspections.
 - Landlord for the site responsibility.

Project Management Approach

- ◆ Cost Control
 - Project Cost Control Group to steer / oversee the strategic direction for the Project and control the budget.
 - Monthly Cost Control report to reflect latest financial situation.
 - To meet the requirements of government audit.

Project Management Approach

- ◆ Quality Control
 - Project Procedures and Good Practices notes in place to streamline the process.
 - Integrated with the Site Supervision Agent.
 - Prequalification of Tenderers.

Project Management Approach

- ◆ Safety Management
 - Safety Committee to oversee the process.
 - MTR senior inspector of works visiting regularly to enhance the system.

- ◆ Environmental Management
 - Responsibility of all parties.

Progress Update

- ◆ Overall project
Overall progress of Line 9 Phase 1 is in line with the program for the opening up to Gui Lin Road Station by end 2007. The last station Yishan Road is scheduled to be completed in 2008.
- ◆ Civil work
All civil structural work was complete up to Gui Lin Road Station. Tunneling works have completed an accumulative total of 94.8% or 19841m. ABWF works for the above ground section will be completed early next year.

Song Jiang Stations

University



She Shan No.2



She Shan



Si Jing



Song Jiang



Jiu Ting



Viaduct、Open Cut Section

R401B



R401A



R402



R403



R421 – Song Jiang Trackwork



R422 –Jiu Ting Open Cut Section to Yi Shan Rd. Station Trackwork



Underground Station

Zhong Chun Rd. Station



Qi Bao Station



Wai Huan Rd. Station



Hong Mei Rd. Station



Gui Lin Rd. Station



Yi Shan Rd. Station



TBM Tunnels



Progress Update

- ◆ E&M work
Equipment installation in 6 Song Jiang stations was complete. All power cabling laying and OHL stringing works from Song Jiang to Jiu Ting were also complete.
- ◆ Testing & commissioning
Traction Substation SS1 was energized on 21st December. This signified the commencement of energisation of main ring circuit in Song Jiang District. All the traction substations and service sub-stations on the Song Jiang section are ready for energisation by end of December.

E&M Works



E&M Works



Challenges

- Marriage of Two Cultures
 - Language barrier
 - Real meaning of the actions
 - Approaches in resolving problems
 - Appreciation of local practices

Challenges

- Implementation of New Practices
 - Selling the idea
 - Down to working level
 - Related parties including Design Consultant, Agents, Contractors and Authorities
 - Benefits not visible on day one

Challenges

- The need for being flexible
 - Typical on a fast track project due to limited time for the planning process
 - Critical for Complicated Project such as Mass Transit Railway Systems
 - How to be well managed to minimize change and the implication to the subsequent Contracts

Challenges

- Resources
 - Shortage of critical resources
 - Plan to be developed to minimize the impact
 - To solicit support from headquarters well in advance
 - Understanding the needs of the local staff
 - To deploy the resources effectively
 - Training for local and Hong Kong staff.

Challenges

- Finding the right partners
 - To work together with a local partner is a double edge sword – the key is getting the right one
 - Treat them openly upfront
 - To build up the trust
 - Alignment of the targets

Challenges

- Building strong working relationship with Government officials
 - Understand their shortfalls / constraints and try to work around it
 - Understand their need and try to satisfy them
 - Understand their political agenda and try to get the most out of it

Conclusions

To do business in China, we have to

- Aware the challenges
- Be flexible and firm enough to manage them
- Nothing is easy and nothing is impossible

Conclusions

- ◆ To establish a positive recognized presence in Shanghai.
- ◆ To facilitate better understanding of international practices.
- ◆ To deliver a high quality Project on time and within budget.

Q & A

Thank you!