

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



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# Background

## Current Status of PRC Metro Development

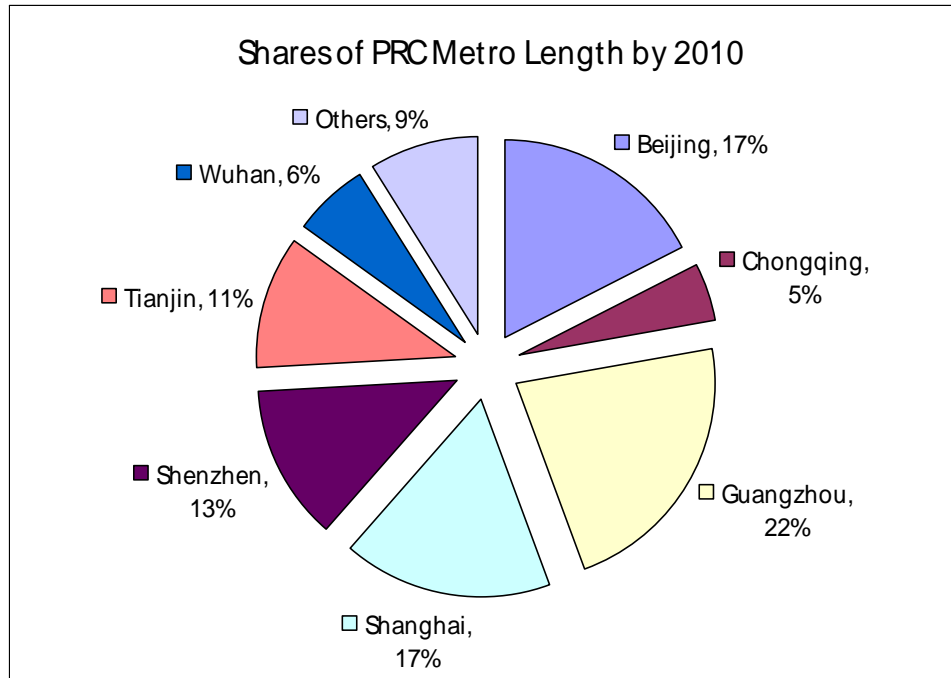
- No of China cities will have metro operation by 2010: 10 (Beijing, Tianjin, Shanghai, Guangzhou, Shenzhen, Nanjing, Wuhan, Chongqing, Shenyang and Chengdu)

Rough Estimate on the scale of metro development in major PRC cities		
Year	Total length of metros in operation , kilometers	Value <sup>(N1)</sup> 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

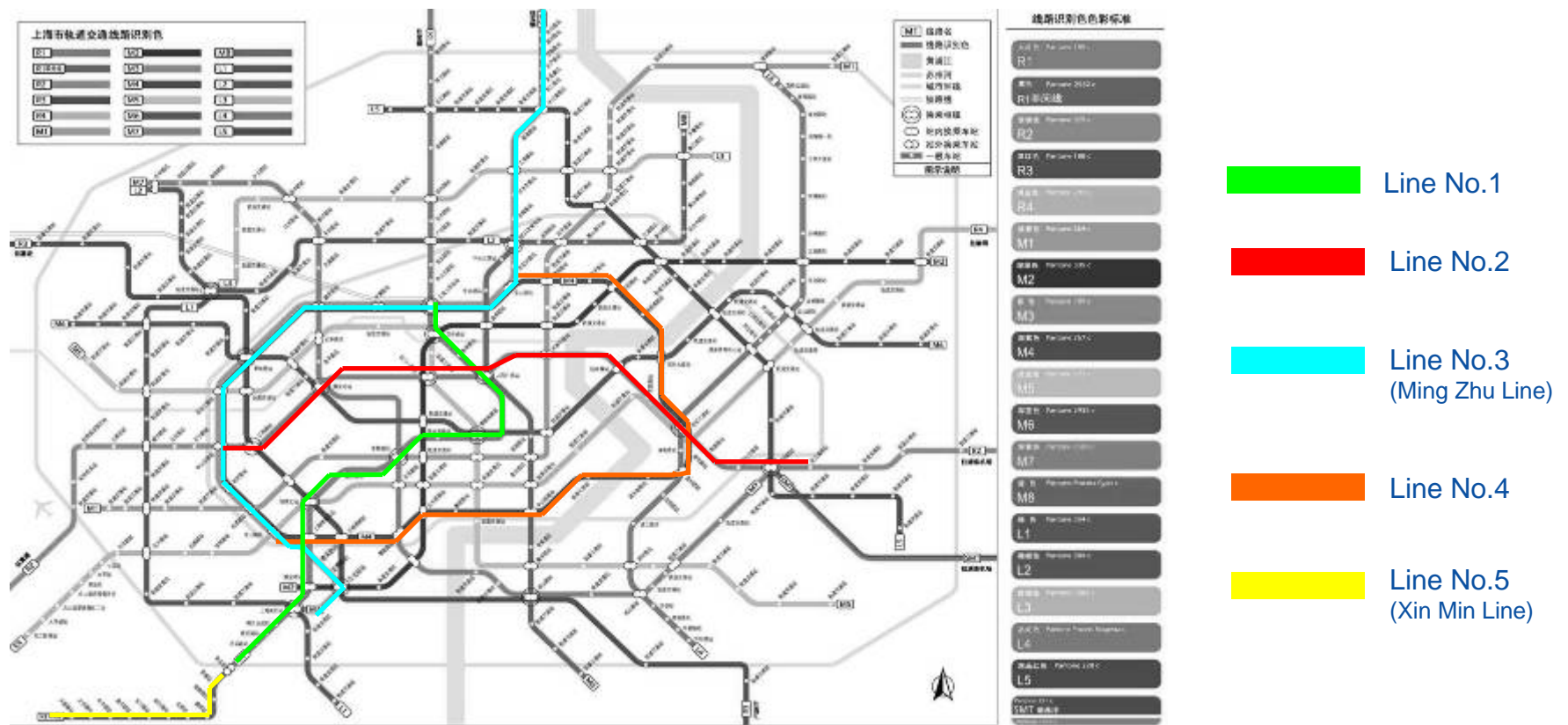
## Current Status of PRC Metro Development



- 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

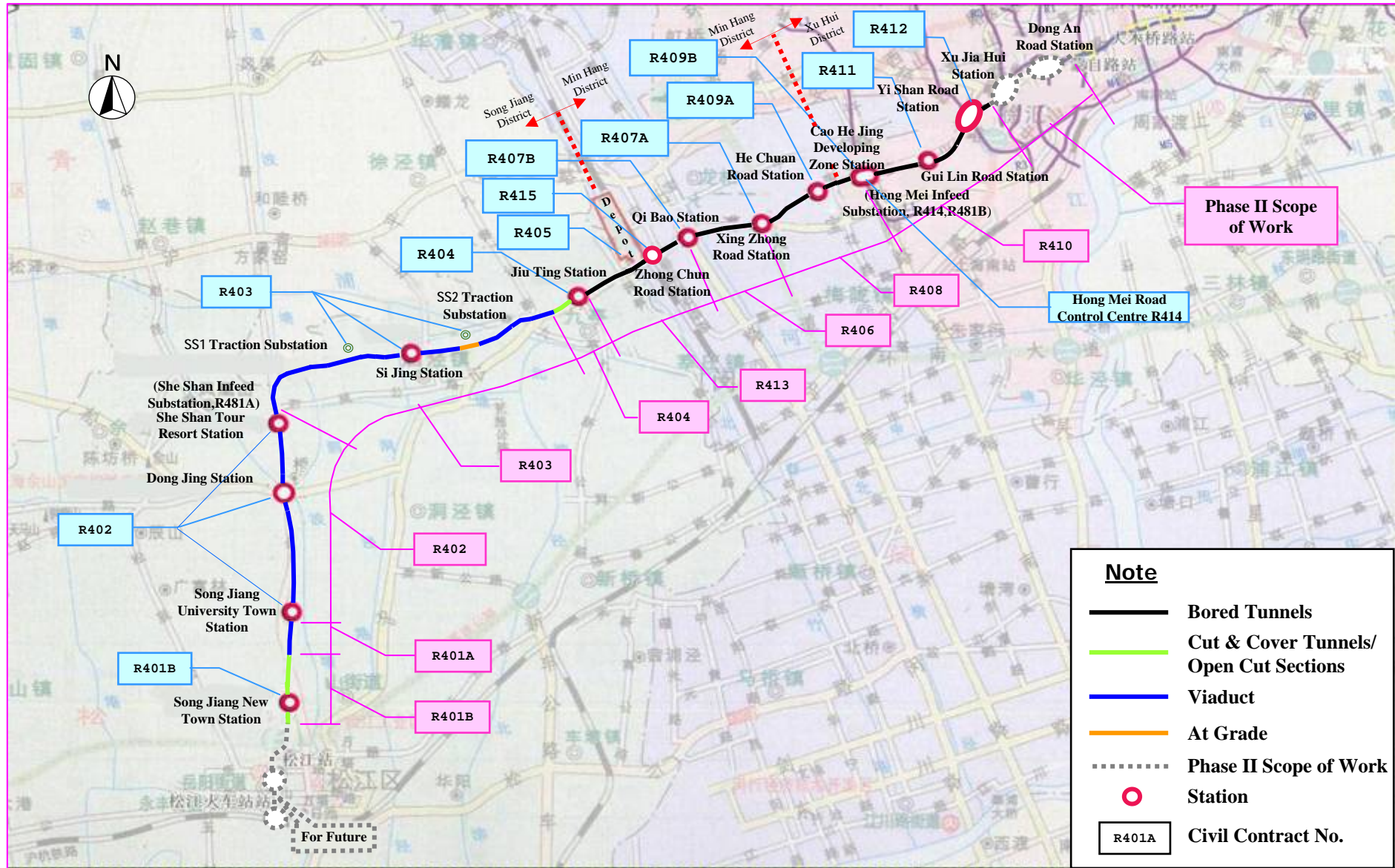
19 lines at around 780km; currently 145km in operation, 155km under construction.



# 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 21<sup>st</sup> 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!**