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China National Expressway Optical Fiber Communication Network: Planning, Construction and Operation

Plenary session
3:30-4:00pm, May 4, 2015
1 BACKGROUND

China National Expressway Optical Fiber Communication Network
National Expressway Mileage

Year 2014: 111,850 Kilometers
Plan 2004:
- Total 85,000 Kilometers
- 7 radial lines (Beijing)
- 9 vertical lines
- 18 horizontal lines
Year 2010: 74,000 Kilometers
Year 2011: 85,000 Kilometers
Plan 2012:

- Total 136,000 Kilometers
- 7 radial lines (Beijing)
- 11 vertical lines
- 18 horizontal lines
- parallel lines, connecting lines and Metropolitan ring lines
Based on *General Specification of Freeway Engineering and Roadside Facilities*, the communication tubes must be equipped simultaneously during expressway construction.

- Communication tubes should be equipped in the isolation belt, the middle of the Expressway.
Requirement for Expressway Construction

- Two generally used communication tubes: Silicon tube, honeycomb pipe
- Optical cable Equipping
- Honeycomb pipe Equipping
- Silicon tube Equipping
2 PLANNING

China National Expressway Optical Fiber Communication Network
In China, the Provincial governments are responsible for expressway construction. So for every national expressway line, many segments are built at first by different provinces, and joined up gradually.

Before the construction of main expressway lines was finished, *National Expressway Optical Fiber Communication Network* is just a conception, only has potential of communication.
2008: MOT initiated the planning study

2011: MOT published the master plan for National Expressway Optical Fiber Communication Network
Planning Objectives

Objective 2015:

- Total 17,200 Kilometers
- 5 loops
- 1 single line
Planning Objectives

Objective 2020:

- Total 25,400 Kilometers
- 10 loops
- 3 single lines
3

CONSTRUCTION

China National Expressway Optical Fiber Communication Network
Network Structure of Demonstration Project

- OTN system, transmission capacity: 10Gb/s (extended 40Gb/s)
- OTN equipment installed at 259 locations of 28 provinces
- Capital cities of 28 provinces (only Xinjiang, Tibet and Hainan not included) were connected
Main Equipment of Demonstration Project

- HUAWEI OptiX OSN 8800 T32
- HUAWEI OSN 6800
- Typical cabinet in the IT room of 259 locations
Investment of Demonstration Project

- Total 300 million RMB
- MOT invested 240 million RMB for all transmission equipment and National Network Monitor & Management Center (at Beijing)
- 28 provincial DOT totally invested about 60 Million RMB for supporting facilities
The Status of Implementation

- Joint test of the whole network was finished at the end of September, 2014
- National Network Monitor & Management Center began its formal operation at the end of March, 2015
- The move of MOT's video conference system is underway
4 OPERATION

China National Expressway Optical Fiber Communication Network
CTTIC is an affiliate of MOT, responsible for the routine maintenance of this communication network.

Basic function: a special communication network for MOT and provincial DOTs, support all information systems of MOT.
- Predicted maintenance expense is about 50-60 million RMB every year, the government budget is far less sufficient.

- Data transmission demand of MOT and provincial DOTs is 500MB/s now, and will be no more than 1Gb/s in 2020. It is much less than the transmission capacity of this communication network.

- A company was established for commercialized operation.
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