CO-DEPLOYMENT OF FIBER OPTIC CABLES ALONG THE HIGHWAY IN REPUBLIC OF KOREA

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### Hierarchy of Highway in Republic of Korea

<table>
<thead>
<tr>
<th>Classification</th>
<th>Authority</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Expressway</td>
<td>KEC Korea Expressway Corporation</td>
<td>4,717 km</td>
</tr>
<tr>
<td>National Highway</td>
<td>MOLIT Ministry of Land, Infrastructure &amp; Transport</td>
<td>13,983 km</td>
</tr>
<tr>
<td>Metropolitan City Road</td>
<td>Local Government (Metropolitan Cities)</td>
<td>4,886 km</td>
</tr>
<tr>
<td>Provincial Road</td>
<td>Local Government (Provinces, or Cities)</td>
<td>18,055 km</td>
</tr>
<tr>
<td>Local Road</td>
<td>Local Government (Cities, or Counties)</td>
<td>68,450 km</td>
</tr>
</tbody>
</table>

Arterial Roads

- National Expressway
- National Highway
- Metropolitan City Road
- Provincial Road
- Local Road

Co-deployment of Fiber Optic Cables along the Highway in Republic of Korea

(as of Dec 2017) 110,091 km
EXPRESSWAYS IN ROK

- **Length**
  - 4% of the total road

- **Traffic Volume**
  - about 50% of the total

- **VKT** (Vehicle-Kilometers Travelled)
  - 75 billion veh-km (in 2015)
  - Increase by 5.7% per annum

- **Average Speed**
  - 86km/h (in 2015)
AH ROUTE IN KOREA

- AH1
  - Gyeongui-line

- AH6
  - Donghae-line
**BACKGROUND**

- In 1992, KEC authorized to install their own FOC
  - For use in traffic control and operation of expressways
  - Until then, KEC leasing communication network from KT

  *KEC (Korea Expressway Corporation), KT (Korea Telecom)*

- Main reason of the KEC’s investment in FOC
  1) to satisfy the demand for high-speed communication for ITS
  2) to respond quickly to changing communication environment
  3) to diversify KEC’s business areas
FOC CO-DEPLOYED ALONG THE ROAD IN ROK

- KEC install FOC along the expressway for the internal needs
  - Traffic operation (CCTV, VDS, VMS, etc.)
  - Intelligent Transportation System
    ▶ FOC network connects the shortest distance between cities

- Total length of FOC network reaches to 12,400km
  - Trunk: 4,700km with expressways
  - Feeder: 7,700km with major arterial highways
Co-deployment of Fiber Optic Cables along the Highway in Republic of Korea
LEGAL BASIS FOR THE CO-DEPLOYMENT OF FOC

▪ Road Act
  – Basis for establishing communication facilities along the roads
  – Mandates for a road management authority
    ▫ Provide traffic information to the road users
    ▫ Manage communication facilities as a road appurtenance

▪ National Transport System Efficiency Act
  – Basis for the collection, communication, processing and provision of traffic information (& traffic information center)
  – Mandate each road management authority should follow a standardized ITS regulation
LEGAL BASIS FOR THE CO-DEPLOYMENT OF FOC

- Framework Act on Telecommunications
  - Basis for a road authority’s own communication network

- Telecommunications Business Act
  - Basis for the road authority to provide communication facilities to telecommunication carriers
  - In particular, KEC and Korea Rail Network Authority (KRNA) are obliged to provide their facilities to the telecommunication business operators
LEGAL BASIS FOR THE CO-DEPLOYMENT OF FOC

- Korea Expressway Corporation Act
  - Basis for KEC to carry out the business of leasing their telecommunications facilities
IMPLEMENTATION & OPERATION OF FOC

- Implementation
  - Most of the FOC implemented by the highway authorities
  - Implementation of FOC strictly managed by national standards
    - Common criteria for implantation, Cable burial method, Cable connecting/branching method, Cable testing method, etc.

- Operation & Maintenance
  - Case A. Implemented by KEC
  - Case B. Implemented by communication carrier
    - B-1. O&M by communication carrier
    - B-2. O&M entrusted to KEC
CASE STUDY

[The use of FOC network in expressway]

Co-deployment of Fiber Optic Cables along the Highway in Republic of Korea
COSTS AND BENEFITS

- Co-deployment status
  - Conduit Line / FOC: 4,002.2km (in 2017)

- Costs: 420,137 million KRW
  - Conduit Line: 213,314 million KRW
  - Fiber Optic Cable: 117,840 million KRW
  - Transmission Facility: 88,983 million KRW

- Benefits: 2,262,318 million KRW
  - Internal Needs: 2,069,317 million KRW
  - Rent: 193,001 million KRW
MAJOR ISSUES AND THEIR ARRANGEMENTS

- Connectivity between authorities
  - Law and Act / Incentives and Penalties
  - Main contents of the agreement between authorities
    ▫ Installation and operation of communication facilities
    ▫ Site, building, cable, electricity use
    ▫ Period of use, the subject of maintenance and expenses

- Principles on cost sharing among agencies
  - Government set the principles for contract and pricing
    ▫ Standard cost method
    ▫ Planned price method
    ▫ Overall cost method
    ▫ Incremental cost method
FUTURE PLAN FOR CROSS BORDER CONNECTIVITY

- Recently, the cooperation b/w ROK and DPRK begins
- Discuss over re-connecting highways and railways
  - June, 2018. Agreed to modernize Gyeongui-line / Donghae-line
  - November, 2018. Discussed survey areas and methods
Asian Highway Routes in the Korean Peninsula
CONCLUSIONS & RECOMMENDATIONS

- Examine the method and procedure
  - Mandate to co-deploy the fiber optic cable along AH routes
  - Connect with the implementation of ITS on AH

- Minimized the trial-and-error in the execution process

- Long-term roadmap for building FOC network
THANK YOU

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