

The Korea  
Railway  
Association



Your Ideal Partner

The Korea  
**Railway**  
Association



# Korea Railway, Leading the **Global Railway Network**

With unflinching determination and total dedication, combined with extensive experience, Korea railway is bringing its unique expertise to the world as a leading proponent of Green Growth. Come and meet your ideal partner!

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*Welcome to  
KORASS*

The Korea Railway Association (KORASS) was established in 2009 with the ambition and intention to connect the railway community of Korea.

KORASS supports exchange and cooperation processes among its members, and acts as a focal point for 'Green Growth'. KORASS is also leading role in the development of railroad technology, and in establishing an effective network of industry-university-institute systems.

Moreover, KORASS provides an essential bridge between government and industry by assuming the functions of advanced railroad policy formulation, and by promoting the international expansion of Korea railway industry.

*Our Mission*

**Our Mission**

The Korea Railway Association (KORASS) aims at maintaining an overriding dynamic of constant green growth; thereby laying the foundation for the realization of tomorrow's dream. KORASS is committed to the provision of ongoing support and encouragement in the national endeavour to become a global brand railroad symbolizing environmental ideals.

*Our Vision*

**Our Vision**

KORASS tries to promote and facilitate the achievement of Korea national vision of 'Using Low Carbon and Building Green Growth' through the conception and utilization of public-private cooperative initiatives.

- **To Improve Korea Railway Industry Value**

KORASS will make every effort to bring to the attention of the wider general public the outstanding merits of an ecologically-friendly and energy-effective green rail transportation system which amply fulfills the 'Low Carbon/ Green Growth' policies.

- **To Support All Policy and Technological Development Efforts**

KORASS will monitor and integrate all railroad-connected and legalization-related policy proposals for submission to government. Such action is likely to facilitate significantly both the health and the growth of the railway industry by aiding the introduction of improvements in technique emanating from an advanced research and development base.

- **Promotion and Support for the International Expansion of the Railway**

KORASS will take all measures necessary to elevate the global perception of Korea railway, and ensure that its vast experience in all facets of rail construction, maintenance, and operation are fully recognised.

- **Establish and Consolidate a United-Cooperative Railway Industry Association**

Composed of members from all railway sectors. It will play a pivotal main role in the systematic development of a railway industry based on an organically public-private cooperation.

# KORASS Main Business

## Services for its members and Support of Internal & External Exchanges and Cooperation

The controlled issue of performance certificates for internal & external orders, and the systematic organization of all sequential roundtable segment meetings.



## Support for Railway Sector Policy and Technical Development

Recording and collecting opinions and submitting proposals to government via Technical Committees (8 sub-committees), Industrial Committees, and Policy Planning Committees, etc.



## Education and Training for Railway Sector Experts

Designing and establishing training courses in international railway operations, including international project order processes, project finance, legal aspects, risk management and rail terminology.

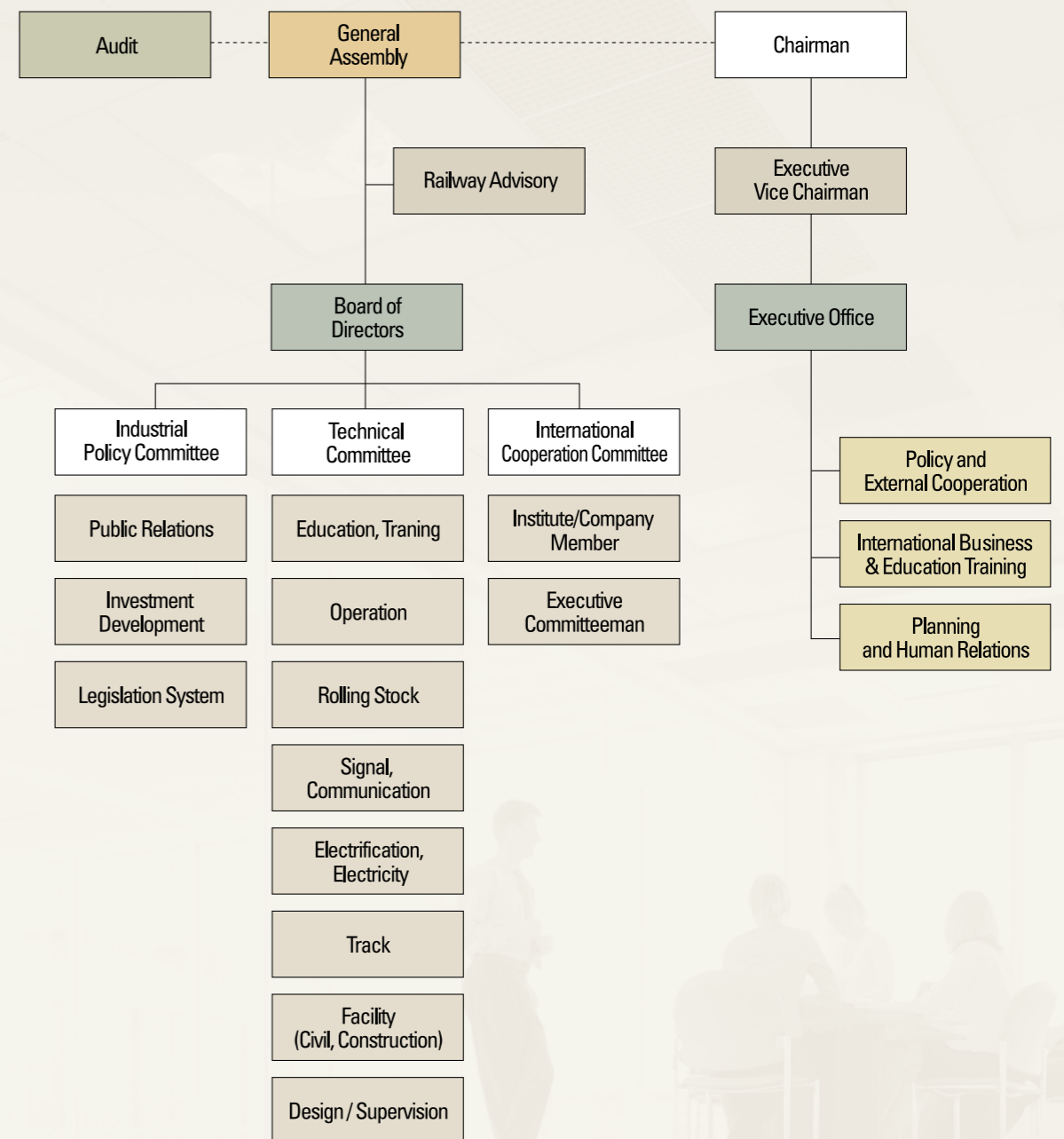


## Promotion and Support for the Expansion of the Korea Railway Industry into the Overseas Market

Build an international cooperation information network.  
Research overseas markets.  
Manage the international railway cooperation fund.  
Host the international railway project conference.



# KORASS Organization



## Korea Railway History

**Sep. 1899**  
Korea first rail line completed, linking the 32 km between Incheon and Seoul.

**Jan. 1905**  
Seoul-Busan rail service inaugurated.

**1950s**  
Rail systems and associated facilities were destroyed by Korean War.

**1960s**  
Railway infrastructure had been completely redesigned and rebuilt.

**1970s**  
Seoul Subway Line1 was operated by the first urban railway system in Seoul.

**1990s**  
Railway development included the introduction of electricification, diesel and locomotive systems.

**Apr. 2004**  
South Korea became the 5th 300km high speed railway operating country in the world.

**Mar. 2010**  
The Korean style high speed train, the KTX-II(Sancheon) was developed and operated.



## Facts & Figures

### Operation agencies include

- Korea Railroad Corporation (KORAIL)
- 7 Railroad Corporations (Seoul Metro, SMRT, Busan, Daejeon, Incheon, Daegu, Gwangju)
- 2 Private Railroad Corporations (Seoul Metro 9, Shibundang Line)
- 2 Light Rail Transits (Busan-Gimhae, Uijeongbu)

- Total operation length : 3,557.3km
- High-speed line : 368.5km (11%)
- Double track : 1,988.4km (56.2%)
- Electrification line : 2,308km (65.5%)
- 652 stations (KORAIL National network)
- Passenger volume : 1,060 million person, 33.01 billion person-km (per year)
- Freight volume : 39,217 million tons, 9.45 billion ton-km (per year)
- KTX punctuality rate : 97% (late within 5 mins.)

Source : Statistical year book of Korea Railroad 2010



Korea Railway Network

## Rolling Stock (KTX-II)

*KTX-II(Sancheon) operation based on Korea's own technology in 2010.*



- Nose shape reduces air resistance
- Aluminum extrusion for car bodies increases structural integrity
- HVAC system at entrance doors and windows withstands pressure waves in tunnels at speeds up to 330 km/hr
- State-of-the-art radio devices, passenger rooms, ergonomic seating, toilet facilities, etc..
- Easy operation and maintenance of Train Control and Diagnostic Systems
- Automatic Coupler System
- Power Bogie and Articulated Bogie Systems with running stability at 400 km/hr



## KTX's Unique Information Technology

### For Passengers

- VHF DMB (Digital Multimedia Broadcasting)
- WiBro (Wireless Broadband) Internet Service
- RFID (Radio-Frequency IDentification)

### For Transport

- Real-time Train Tracking System
- Ticket Reservation and Issuance Systems
- Sales/Marketing/Profit Management System
- Logistics Information System

### For Maintenance

- RCM (Reliability Centered Maintenance) system on the Rolling Stock (R/S)
- IRIS (Integrated Railroad Information System)
- ERP (Enterprise Resources Planning) system
- MICS (R/S Maintenance Information Control System)
- Information Network System near railways
- Railway Facility Management System



## Operation & Maintenance

Korea railway takes pride in its state-of-the-art technology.

We give comprehensive technical advice for inspections, maintenance, replacement, and upgrades to ensure optimum railway safety.

We also provide the guaranteed E&M system based on Verification Engineering (VE) and RAMS technology.



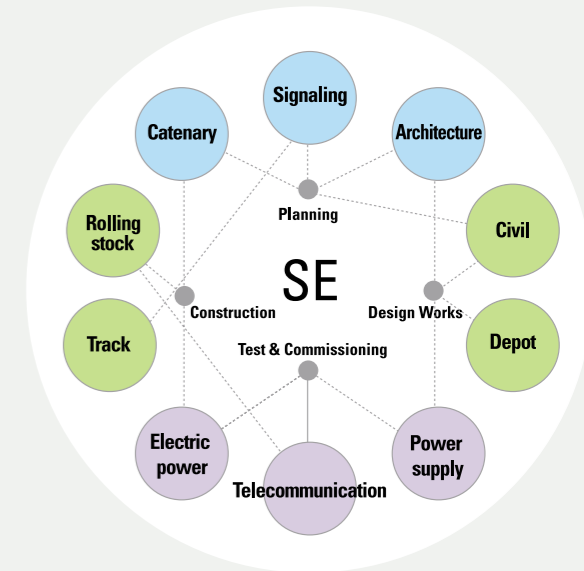
## System Engineering & Project Management

### System Engineering

- Ensures quality levels through System Engineering, Value Engineering, Interface Management, and Analysis of reliability and safety
- Minimizes potential risks, time and cost overruns throughout project duration

### Project Management

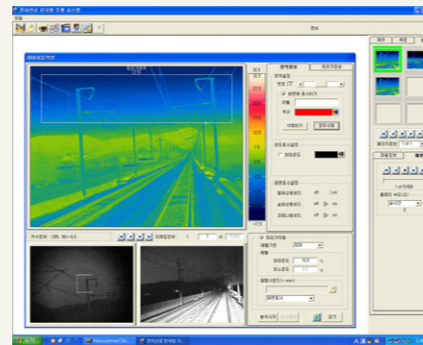
- Develops and operates a project management system that enables systematic railway construction management
- Maximizes communication between project partners, and management efficiency, by operating a proven project management system
- Identifies and resolves project issues and problems as soon as they arise by using a critical items management system



## Electrical System

*Railway electrification enables increased transport volumes and higher speeds with lower energy consumption. Korea railway provides the best solution for railway electrification.*

- Power Distribution Facilities
- Catenary and Feeder systems
- Remote Control Facilities
- Ancillary Equipment
- Measuring Instruments
- Sub-stations
- SCADA (Supervisory Control And Data Acquisition)
- Standardization of Maintenance Processes and Expert Training



## Signaling & Communication System

### Signaling System

- CTC (Centralized Traffic Control) System Operation and Maintenance
- Interlocking System (Relays, Electronic and Computerized types)
- Block Systems
- Onboard Signaling Systems (ATC, ATP, ERTMS)
- Safety Systems (ATS, Level Crossings)
- Field Facilities (Point Machines, Track Circuits, Signal Lights, etc.)
- Remote Monitoring and Telemetric Systems
- Platform Screen Door Systems



### Communication System

- Train Radio System
- Passenger Information System
- Automatic Fare Collection System
- Communication Network
- Digital Data Transmission System

Installation of Catenary

SCADA (Supervisory Control And Data Acquisition)

CTC(Centralized Traffic Control) System

Monitoring Electrification Facilities





## Civil & Track Engineering

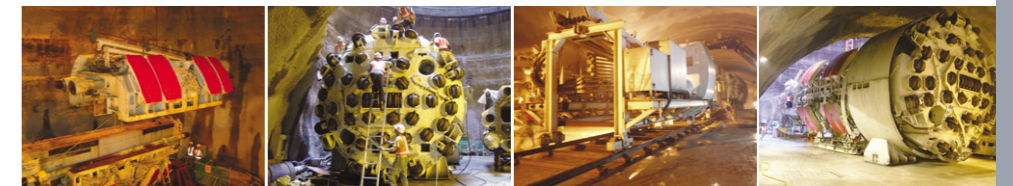
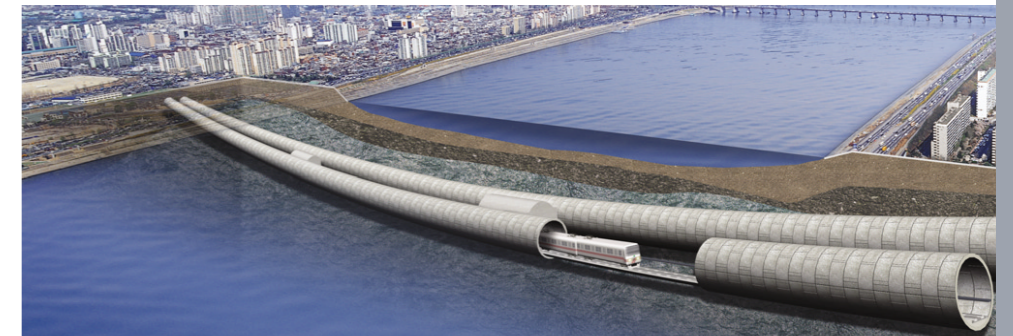


- Railway Track System and Turn-Outs
- Bridges, Tunnels, Roadbeds
- Railway Crossings and Grade Separation Facilities
- Station Buildings and Structures

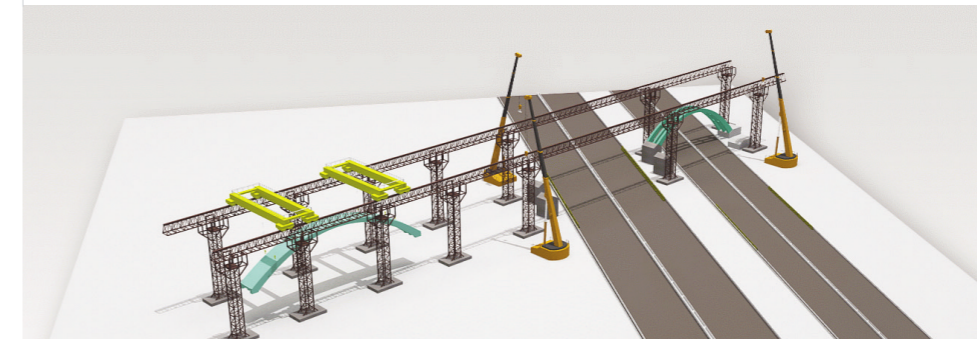
## New Construction Technology

### Tunnel Boring Machine (TBM) Method

- Excavates 5.0 metre pilot tunnel at the center of the main tunnel
- Minimizes blasting vibration by using 2-stage blasting



### Concrete Steel- Arch Bridge



① Install Temporary Supports    ② Install Temporary Truss    ③ Assembling Steel Arch    ④ Lifting Steel Arch    ⑤ Install Steel Arch

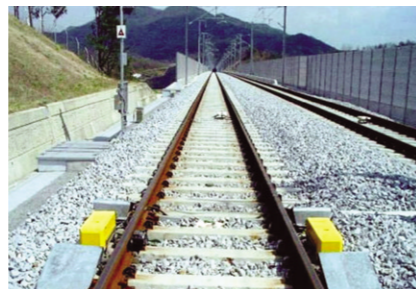
## Railway Safety Management

*For efficient and safe railway operation, Korea railway has devised an emergency recovery procedure, advanced safety regulations, and sophisticated safety systems.*



### Safety Facilities for KTX Operation

- Hot Box Detectors
- Intrusion Detectors
- Dragging Detectors
- Meteorological Detectors
- Tunnel Alarm Control Boxes
- Protective Staff Crossing Equipment
- Rail Temperature Control Panels



## Station Area Development

Transit oriented development at station areas



## Future of Korea Railway



### New Korea Railway Transportation

#### Advanced Train HEMU-400x

A next-generation high speed train has been under development since 2007. It is an EMU system with a maximum speed of 400 km/hr.

Emphasis is placed on safety, comfort, capacity, and high speed. The next-generation high speed train will operate on the Distributed Traction System which will reduce maintenance costs significantly. Furthermore, its outstanding capacity for rapid acceleration and deceleration will make it ideally suited to the practicalities of the Korean rail system.

#### Bimodal Transportation

'Bimodal' tramcar can run on both normal road surfaces and railway tracks. This capacity to function on two types of track-way explains the origin of the nomenclature 'bimodal'.

Since bimodal is electronically controlled and driverless when operating on its exclusive track, it is capable of maintaining extremely accurate and regular running times. The carriage capacity of a bimodal tram is between the light rail transit and the bus. The construction cost is low; returning a figure of USD 155,000/3.4 million/km.

## Technology Transfer

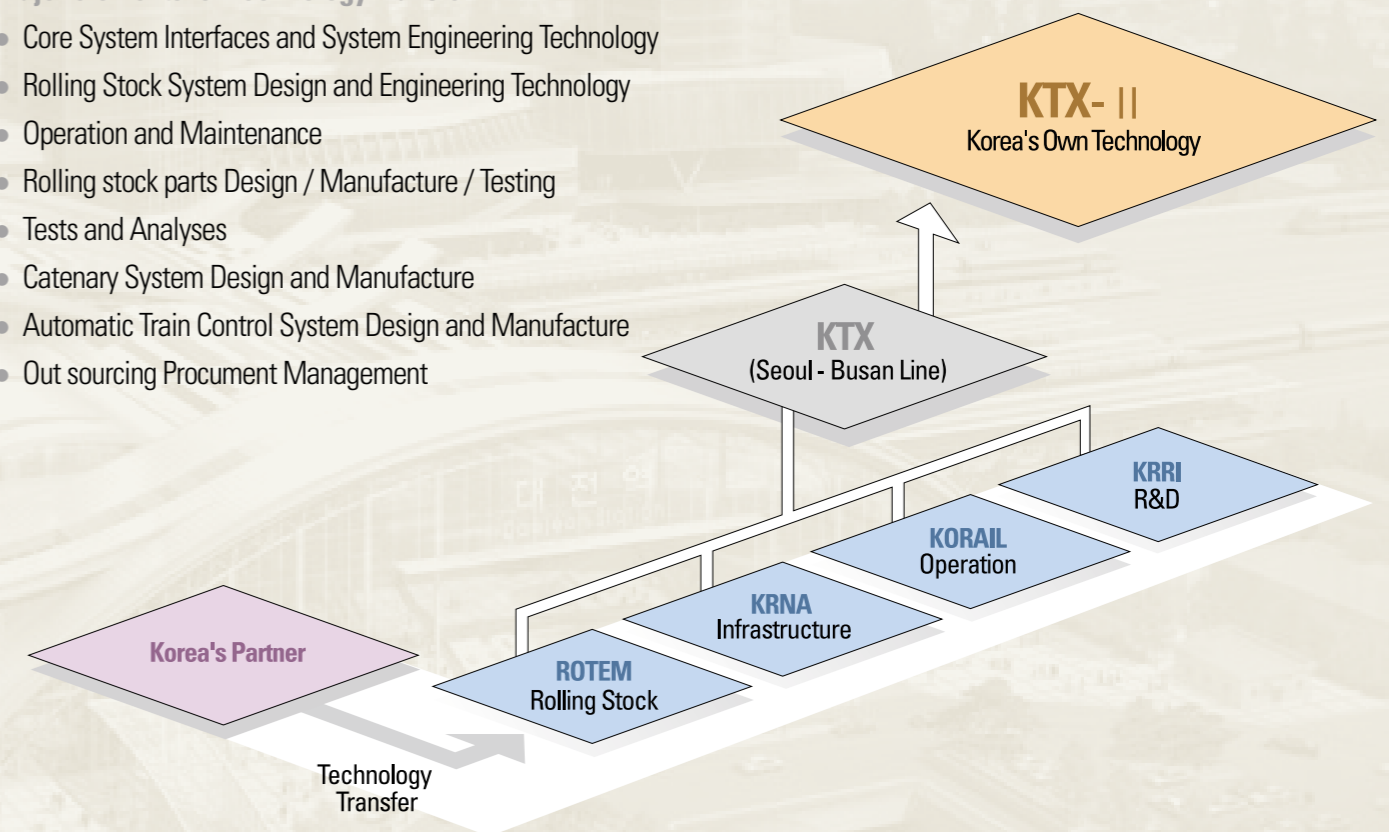
Korea railway developed the KTX-II entirely from Korea's own technology. With the wealth of experience and expertise, Korea will be in a position to transfer this technology to other nations and new partners.

#### Forms of Technology Transfer

- Documents: Design Data, Drawings, Specifications
- Training: On-site Training, Engineering, and R&D
- Technical Support, High speed railway

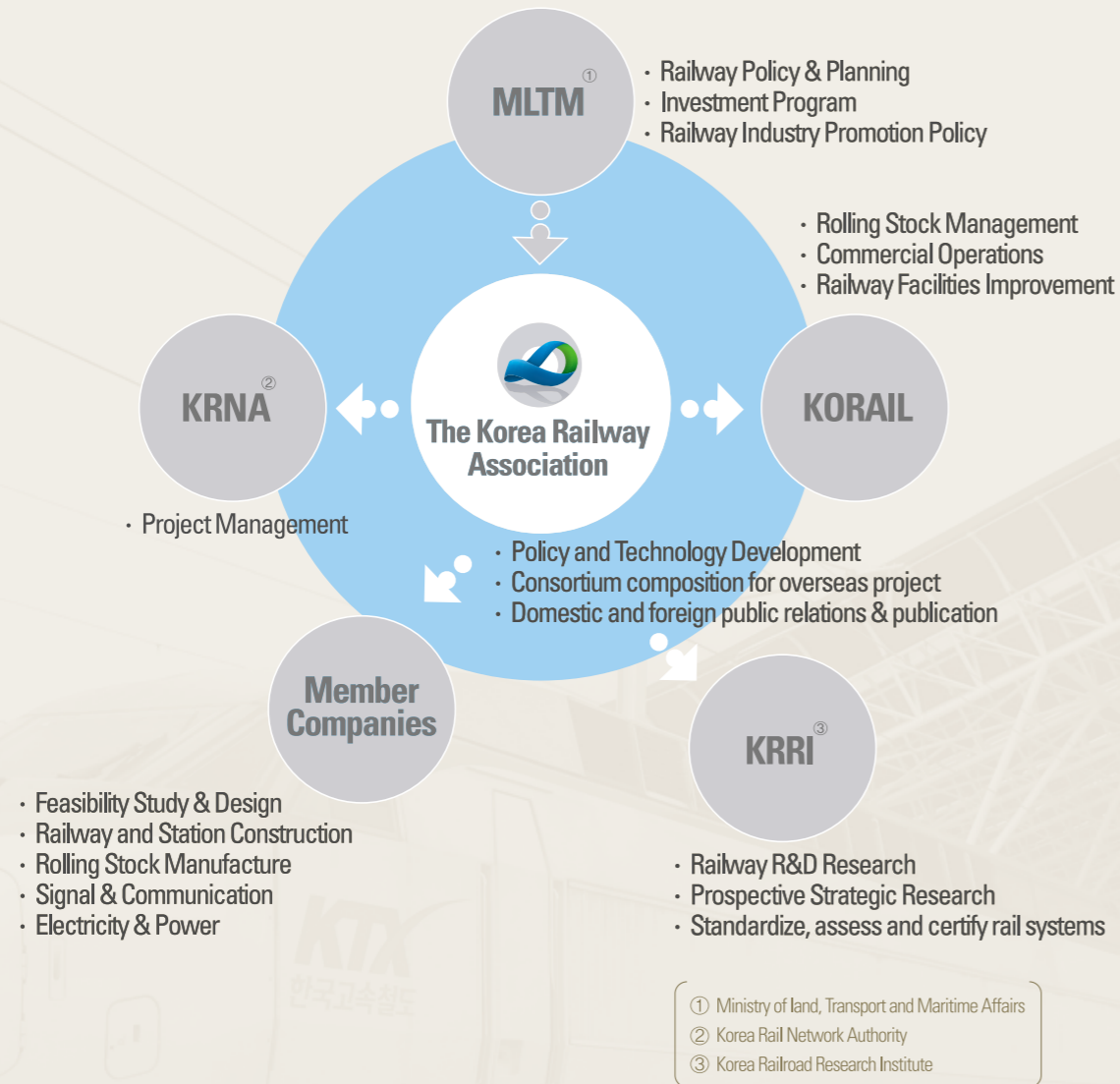
#### Major elements for Technology Transfer

- Core System Interfaces and System Engineering Technology
- Rolling Stock System Design and Engineering Technology
- Operation and Maintenance
- Rolling stock parts Design / Manufacture / Testing
- Tests and Analyses
- Catenary System Design and Manufacture
- Automatic Train Control System Design and Manufacture
- Out sourcing Procurement Management



## Korea Railway System

### Entities & Our Functions



## Total Solution

Equipped with high technology and extensive hands-on experience, Korea railway can provide the optimal solution tailored service to customer requirement.

Korea railway is explicitly geared to organize consortium focused on the specific characteristics and unique requirements of any railway project.

In addition to ensuring the best solutions and desired outcomes, partnership with Korea railway will also include the added values of participation in the promotion of Green Growth and, thereby, contribute to an enhanced global environment.

# KORASS Contact Points

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